BALKAN FLINT AND NEOLITHIC CHIPPED-STONE ASSEMBLAGES FROM BULGARIA: A MULTIFACETED DIACHRONIC OVERVIEW

Maria GUROVA



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SUPPLEMENTUM 14

БАЛКАНСКИ ФЛИНТ И НЕОЛИТНИ КРЕМЪЧНИ АНСАМБЛИ ОТ БЪЛГАРИЯ: МНОГОАСПЕКТЕН ДИАХРОНЕН ОБЗОР

Мария ГЮРОВА





София 2026

To my mother, Elena,

and in loving memory of my father, Ranguel

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PREFACE

The Neolithic in Bulgaria, recognized for its significant technological and cultural achievements, as well as its artistic depictions, established the region as a key area within the Balkan Early Neolithic *oikoumene* and contributed substantially to the spread of the Neolithic into Europe. Each aspect of the multifaceted Neolithization process warrants thorough research and publication, including the pre-Neolithic background, the emergence and diversification of 'Neolithic packages', raw material provenance and distribution, chronological frameworks, manifestations of material culture and regional variation, and evidence of ritual and sacred patterns. Further research should also consider the evidence provided by ancient DNA analysis and the reconstruction of human group mobility.

The Bulgarian prehistoric 'archaeological archive' contains rich information on various aspects of the Neolithic lifestyle. Recent extensive and intensive rescue investigations of many sites offer more and more evidence of known and new aspects of our ancestry during the 6th millennium cal BC. Our role as scholars is to assimilate the new gnoseological challenges based on a solid empirical and theoretical corpus of knowledge, accepting, rejecting, or revising them reasonably and intelligently, if possible.

My objective in compiling analytical results from almost three decades of research, focusing on Holocene chipped-stone assemblages, stems from an appreciation that there is sufficient new knowledge that deserves to be shared. For many decades, in the Bulgarian specialized literature, flint assemblages have been treated as less informative than pottery styles and as less significant compared to other 'social proxies' in the mainstream literature on Neolithization.

In 2009, I wrote a paper entitled "The flint factor on the Neolithization debate". I had no illusions that something dramatic would change in the attitudes of many scholars toward prehistoric flints. I hope, however, that the new, professional way I approached Balkan flint – as just one type of flint, but **the one** that was undoubtedly intertwined with the transformative processes of prehistoric life, and I have tried in a series of publications to promote its crucial role and importance. I also hope that the new dataset presented in this manuscript will facilitate further advances in Neolithic studies, while maintaining appropriate analytical standards and requirements.

Neolithic chipped-stone assemblages (below often referred to simply as flint assemblages) were, for a long time, not sufficiently attractive (hence systematically underestimated) in the discourse on Neolithic themes and problems. My ambition (NOT pretension) is to share my thoughts on some of the crucial questions concerning the Neolithic in Bulgaria, to share serious analytical results in the scope of raw material problems, techno-typological characteristics of the flint assemblages, emergence and development of the main agricultural toolkits and practices, and regional and supra-regional mobility, based on the supply and distribution of flint resources.

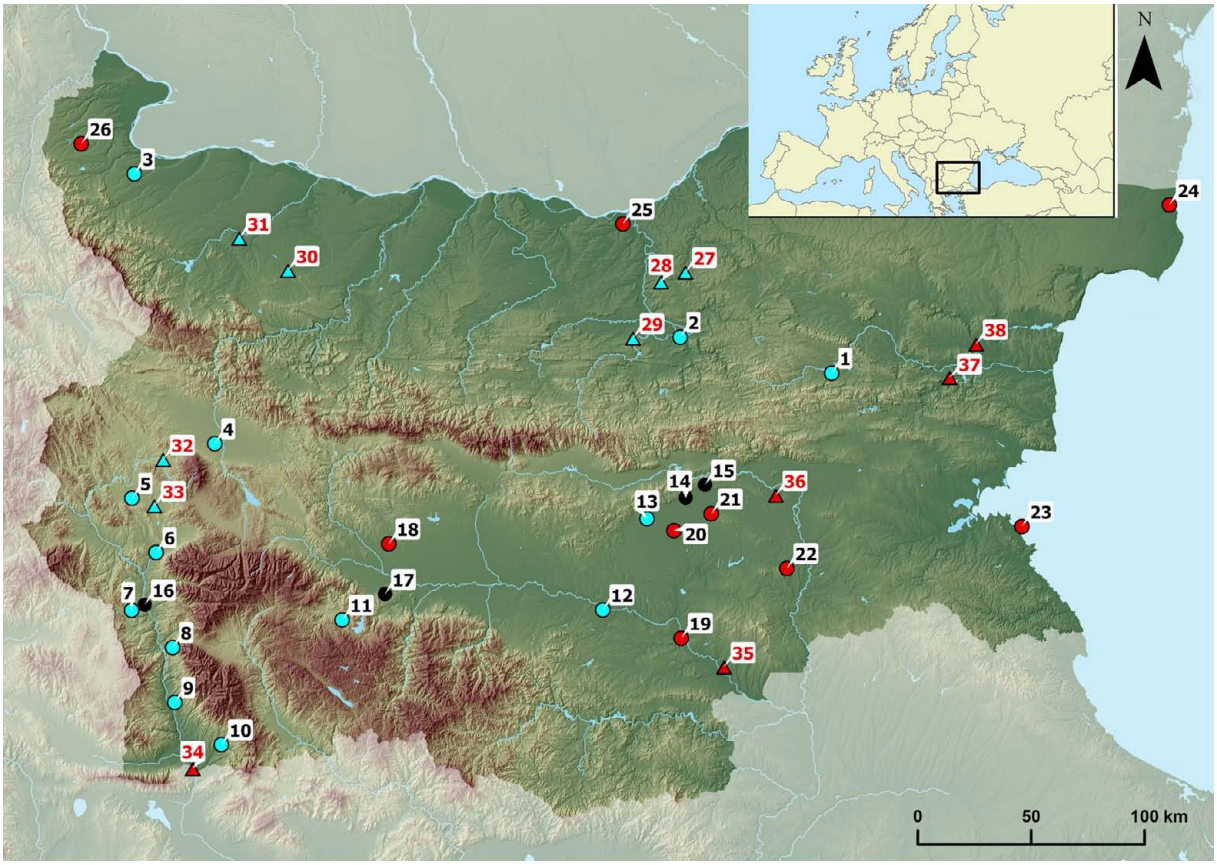


*Fig. 1. Map of Bulgaria with locations of the Neolithic sites mentioned in the text: 1. Varbitsa; 2. Dzhulyunitsa; 3. Yarlovitsa; 4. Slatina–Sofia; 5. Negovantsi; 6. Dzherman; 7. Drenkovo; 8. Brezhani; 9. Ilindentsi; 10. Kovachevo; 11. Rakitovo; 12. Yabalkovo; 13. Azmak; 14. Karanovo; 15. Musovitsa; 16. Balgarchevo; 17. Kapitan Dimitrievo; 18. Apriltsi; 19. Harmanli; 20. Sarnevo; 21. Ezero (Dryanova mogila); 22. Drama–Gerena; 23. Sozopol; 24. Durankulak; 25. Tash Bair; 26. Brankovtsi; 27. Koprivets; 28. Orlovets; 29. Plochite–Samovodene; 30. Ohoden; 31. Gradeshnitsa; 32. Pernik; 33. Galabnik; 34. Topolnitsa; 35. Lyubimets–Dana bunar 2; 36. Hadzhidimitrovo; 37. Usoe; 38. Provadia–Solnitsata. **Legend**: cyan circle – Early Neolithic site; black circle – Early & Late Neolithic site; red circle – Late Neolithic site; circles – site assemblages studied by the author; triangles – site assemblages used by publications (figure by N. Kecheva)*

During my research, I had the opportunity to study more than forty Neolithic assemblages from settlements identified through field prospections, regular and rescue excavations. Most of the assemblages are considered in the text below, and they are presented in Fig. 1. Apart from those assemblages studied by me, there are some that are mentioned in my comments and in a comparative perspective with the sites presented in more detail. A general overview of the Neolithic chipped-stone assemblages from Bulgaria is presented in Part I of this work, where the assemblages are assessed and interpreted in a conceptual and contextual perspective. In Part II, eight sites are presented as case studies in greater detail, following a conventional structure. The arguments for the selection of these sites are presented in the introduction to Part II.

I am aware of the differences in scholars' opinions on various topics in the Neolithic research agenda, such as chronology, periodization, nomenclature (terminology), the interpretation of artefacts and site characteristics, continuity, transition, and even the distinction between sacred and profane. My purpose is not to criticize self-serving hypotheses and/or theses, but to confront arguments that I consider serious and introduce some knowledge and evidence from the analysis and careful interpretation of flint assemblages.

Regarding the culture-historical approach and the terminology associated with it, I sympathize with some 'innovative' ideas; for example, Watkins' ideas for overcoming the paradigm and outdated constructs surrounding Neolithization, and, in general, the old-fashioned conceptualism of the culture-historical approach. However, I am not fully prepared to replace archaeological cultures with "nested networks", although I would prefer "community" instead of "villager" (cf. Watkins 2013). Without any preconditioned enthusiasm, I am using labels, constructs and concepts related to networks, interactions, exchange, transition, transformation, etc., as well as traditional terms such as cultures and cultural periodization, which, at this stage of archaeological theoretical creativity, are still useful instruments of contextualization and temporal-spatial markers. Such a 'dualism' of using old-fashioned culture-historical labels with refreshing nuances of (post-)processual vocabulary and meaning is useful and justifiable. A similar conceptualization was formulated by D. Borić, who suggested: "Instead of abandoning ... the notion of archaeological culture, it is suggested that the redefined ontological status of this entity, seen as a complex assemblage of interpersonal social networks, can take it beyond the essentializing tendencies of older scholarship. In this way, the notion of archaeological culture can be meaningfully connected to complexities and intricacies of social life" (Borić 2015, 194).

The research methods are sufficiently clear and well presented in my previous publications. They will be recalled briefly in the relevant parts of the text.

My understanding of the necessary quality of a recent scientific publication on lithics/flints encompasses several key requirements: high-quality coloured images, high-quality artefact drawings, multidisciplinary analyses and results, interpretations consistent with the archaeological evidence, and a sufficiently comprehensive reference corpus. This manuscript is far from optimal, but at least it represents a challenging attempt to produce scientifically sound research.

Throughout my extensive studies, I was pleased to collaborate with many colleagues and achieve mutually satisfactory outcomes in our shared experience. Many colleagues offered me their Neolithic collections to study, while with others I engaged in discussions on various prehistoric topics. Some simply sympathized with my efforts and openly appreciated the results I produced. Together with others, we worked hard to create publications and promote innovative geoarchaeological research methods.

It is my pleasure to mention the names of the colleagues to whom I am grateful (in alphabetical order and hoping not to omit anyone): **A**ndreeva, Polina; **B**acvarov, Krum; **B**akamska, Aneta; **B**onsall, Clive; **B**orić, Dušan; **B**oyadzhiev, Kamen; **B**randl, Michael; **C**hakarov, Kalin; **C**hapman, John; **C**hohadhiev, Alexander; **D**emoule, Jean-Paul; **D**imitrov, Kalin; **D**uru Refik†; **D**zhanfezova Tanya; **E**lenski, Nedko; **G**anetsovski, Georgi; **G**aydarska Bisserka; **G**rębska-Kulow, Malgorzata; **G**rigorov, Valeri; **I**gnatova, Stoilka; **I**vanov, Georgi; **I**vanova Stefanka; **J**ovanović, Ivana; **K**ancheva-Ruseva, Tatyana; **K**echeva, Nadezhda; **K**ostov, Ruslan; **K**rauss, Raiko; **L**eshtakov, Krasimir; **L**ichardus-Itten, Marion; **M**arinova, Elena; **M**ateva, Boryana; **N**achev, Chavdar; **N**ikolov, Vasil; **P**anayotova, Krastina; **P**awlikowski, Miacej; **P**erić Slaviša**;** **P**erlès, Catherine; **P**opov, Hristo; **P**ristavova, Stefka; **R**oodenberg, Jacob; **R**osen, Steven; **S**tefanova, Elitsa; **S**tefanova, Tatiana; **S**lavchev, Vladimir; **T**odorov, Vladimir; **U**murtak, Gülsün; **V**agalinski, Lyudmil; **V**enelinova, Svetlana; **Z**idarov, Petar.

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PART I – GENERAL OVERVIEW

1. CHRONO-CULTURAL FRAMEWORK OF THE NEOLITHIC AND PROXIES FOR THE 'REGIONAL' NEOLITHIZATION

Absolute chronology as determined by radiocarbon dating (preferably in convincing series) is crucial for placing prehistoric events and processes in a reliable temporal framework as well as for reconstructing their development, dynamics and evolution *vs* retardations. The chronological framework of the Neolithic in Bulgaria, as presented in published sources, is outlined below. Despite apparent discrepancies across publications, I believe the presented chrono-cultural framework is necessary as a general temporal framework for all cultural processes and events discussed in my study, given that dating and references to the chronology are provided. The first is the conventional chronology, published long ago. Although it has not been updated, there is still no alternative general chronological scheme. It should be stressed that I did not make any calibration updates or additional Bayesian interpretative modelling. All dates are taken as published by the cited authors, not always containing radiocarbon BP age range:

NEOLITHIC: Phase	**Date ranges (cal BC)**
Early Pottery	6300/6200–6000/5900
Early	6000/5900–5500/5450 (classical)
Middle	5500/5450–5200/5150
Late	5200/5150–4900/4850 (Boyadziev 1995, 179).

Boyadzhiev provided this summary of the prehistoric chronology based on ^{14}C BP dates of the following Neolithic sites: Polyanitsa Platoto, Chavdar, Karanovo, Azmak, Stara Zagora, Galabnik, Slatina, Eleshnitsa, Dobrinishte, Kremenik, Ovcharovo–Gorata, Kachitsa, Topolnitsa, Strumsko, and Balgarchevo.

The traditional chrono-cultural division of the Neolithic period is based on the sequence at Tell Karanovo, and ^{14}C dates for the part of the sequence suggest the following chart:

- Karanovo I – 6000–5750 cal BC;
- Karanovo II – 5750–5500 cal BC;
- Karanovo III – 5500–5280 cal BC (Görsdorf 1997, 379).

The entire Neolithic sequence of Karanovo is later presented in two ^{14}C databases compiled by Reingruber and Thissen (Reinbruber, Thissen 2005; Thissen, Reingruber 2017). The latter is used in the chronological framework presented here:

- Karanovo I – 7090–6730 BP, 6060/5850–5720/5640 cal BC 1σ;
- Karanovo II – 6807–6490 BP, 5810/5620–5610/5320 cal BC 1σ;
- Karanovo III – 6590–6350 BP, 5610/5480–5470/5220 cal BC 1σ;
- Karanovo III–IV – 6430–6415 BP; 5470/5370–5360 cal BC1σ;

- Karanovo IV – 6180–5960 BP; 5220–5060/4910–4780 cal BC1σ (Thissen, Reingruber 2017, 159).

The interruption in the sequence between Karanovo III–IV and IV is partially resolved by the new series of dates from the "pit field" site of Sarnevo, giving a time span of 5375–5320 cal BC to 5335–5290 cal BC for the Karanovo III–IV (Cook et al. 2017, 509).

Durable and detailed research on the pottery assemblages from Karanovo further refined the conventional periodization, and the cultural periods identified by V. Nikolov are summarized here because the routine parallels of pottery assemblages are made by site excavators (including in some of the Case studies I present), referring to the detailed Karanovo periodization:

- Karanovo I culture (Early Neolithic) = Karanovo I period/layer at the eponymous Tell;

- Karanovo II culture (Early Neolithic) = Karanovo II period/layer;

- Proto-Karanovo III cultural event (Middle Neolithic) = Karanovo II–III period/layer;

- Karanovo III culture (Late Neolithic) = Karanovo III period/layer;

- Karanovo III–I V culture (Late Neolithic) = Karanovo III–IV period/layer;

- Karanovo IV culture (Late Neolithic) = Karanovo IV period/layer (Николов 1998; Nikolov 1998; 2004, 20–22).

A similar chronological framework of Neolithic "phases" in Bulgarian Thrace has been presented based on pottery repertoire analysis (Nikolov 2017). I should stress that the Karanovo chronology and periodization are a suitable and workable tool for synchronizing of cultural/social events and processes at local, regional and supra-regional scales. In this role, I employ the aforementioned chronology and cultural division without absolutizing the meaning and epistemological limits of the notion and the content of 'culture'. Challenging thoughts about the scales of periodization and their cohesion/collision with 'culture' are presented in a recent paper (Demoule, Manolakakis 2022, 348).

Two crucial clarifications are needed here – the first is that the author intentionally avoids going deeper into the distinctions between the various Neolithic cultures and their subdivisions, based mainly on the pottery assemblages. Summarized views on cultural periodization and synchcronization (both relative and absolute) are well presented by other researchers, given their consideration and conceptualization of prehistoric processes and community interactions based on the pottery assemblages. They can be read for a deeper understanding of the topic. Apart from Nikolov *(vide supra)*, an understandable scheme of cultures, (cultural) complexes and blocs is presented in Table 4 of Todorova and Vajsov's book on the Neolithic (Тодорова, Вайсов 1993, 71, табл. 4), followed by a general chronological table of the Neolithic cultures in different areas of Bulgaria (ibid., 98, Table 10). Another more recent source of detailed information on the periodization of the Early Neolithic cultures in Bulgaria is Y. Boyadzhiev's detailed study (Boyadzhiev 2009). Starting with a retrospective view on the various optional periodizations/synchronizations the author emphasizes that they have always been established on an "overestimation of the pottery as a chronological indicator" (ibid., 8). Introducing serious dataset of ^{14}C dates, Boyadzhiev is offering a table correlating stratigraphic contexts of the main multi-layer settlements in southern Bulgaria alongside with the pottery styles they are associated with (ibid., 9, Table 2) More complex synchronization of the main Early Neolithic sites is offered – completed with the main sites from northern Bulgaria and again with the distinct pottery styles as follows: monochrome, white painted, dark painted and dark burnished (Karanovo II) (ibid., 38, Table 5). The overview of the Early Neolithic cultures concludes with a Table synchronizing the conventionally known cultures in Bulgaria, Greece and Serbia (ibid., 39,

Table 6). Boyadzhiev's construct of the transformation from the Early to the Late Neolithic and the massive spread of the latter across the country is in partial disagreement with V. Nikolov's scenario of the cultural processes dynamics in Neolithic Thrace (Nikolov 2004; Boyadzhiev 2009. 40). However, both publications would be very useful for anyone willing to understand the complexity of inter-community life (and mobility) of the Neolithic population through the lens of pottery studies.

The second important clarification concerns the terms I am using in the text as synonyms –Karanovo I–II cultural alliance/milieu/*koiné*[1]. With these terms, I am NOT referring to a cultural complex with a unified pottery style whose temporal-spatial determination belongs uniquely to the eponymous Tell Karanovo. Based on my observations on chipped-stone assemblages from numerous sites in southern Bulgaria, I am using the terms to refer to the two Early Neolithic cultures and periods in Tell Karanovo where they originate from (the first half of the 6th millennium cal BC), and from there (and particularly Karanovo I culture) expand in various directions. My primary consideration is that, in the sense of diagnostic formal tools of Balkan flint, this 'label' of Karanovo I–II cultural alliance is reasonable and instructive, and does not extrapolate any 'common pottery characteristics' into the sites whose assemblages I am commenting on. The durability of the diagnostic features of the formal tools (*ca* 5 centuries) contrasts with the 'ephemeral' pottery fashion and changes. Still, both elements of the material culture and social interactivity (flints and ceramics) have their own value, significance and meaning.

Turning again to the chronological background in my focus, it can be stated that there are four dated sites with an earlier beginning of the Neolithic sequence than at Tell Karanovo. In southern Bulgaria, earlier than Karanovo I is Kovachevo (in the Middle Struma valley), where the oldest phase (Kovachevo Ia) has dates of 6159–5926 cal BC and 6064–5808 cal BC (Lichardus-Itten et al. 2006, 85). The earliest published date falls to 6130 ± 58 cal BC (Lichardus-Itten 2022, 306, Table 18.1). On the other hand, the Kovachevo Ia dates are included in the database of Thissen and Reingruber as 7245/7222 and 7180 BP; 6210/6050–6080/6000 cal BC 1σ (Thissen, Reingruber 2017, 138) and in the Krauss updates of 7245 BP, it is 6123.5 cal BC (*vide infra*).

There is the site of Galabnik in the Upper Struma valley with a date of 7140 BP (6031.5 cal BC) and the earliest levels at Tell Azmak in Thrace – 6172 BP (6172 cal BC) (*vide infra*, Krauss dataset – 2023, Table 7). The respective earliest dates in the Thissen, Reingruber dataset are: for Galabnik – 7120 BP, 6070/5910 cal BC 1σ and for Azmak – 7303 BP, 6360/6020 cal BC 1σ, with a note that the *Quercus* charcoal used for measurement could be older than the settlements (Thissen, Reingruber 2017, 158).

The confusing discrepancy in BC dates based on radiocarbon ages of the sites is beyond the scope of my study, and I am not competent to delve deeper into ^{14}C dating modelling. Instead, in the text below, I have relied on the dates as published by Raiko Krauss in his book "The Dynamics of Neolithization in South-Eastern Europe" (Krauss 2023).

On the other hand, several sites in northern Bulgaria have remains attributable to the so-called 'monochrome phase' of the Early Neolithic or 'pre-Karanovo' stage. Without delving into the terminological or semantic relevance of the term "monochrome", it should be emphasized that only three sites have dates earlier than 6000 cal BC; these are Dzhulyunitsa, Orlovets, and the oldest layers of Koprivets. They belong to the earliest phase of the Neolithic in northeast

1 See the text from the section 2.3.3 and further on.

Bulgaria, corresponding to the period ca 6100–5700 cal BC, with the most reliable ^{14}C series coming from Dzhulyunitsa (Krauss et al. 2014; Marinova, Krauss 2014). As for the latter site, the beginning of the sequence and the time span of the lowermost layers I and II can be reliably dated to between 6050–5950 cal BC (Krauss et al. 2014, 63). Interestingly and somewhat questionably, in a later publication, the Early Neolithic sequence of Dzhulyunitsa, based on the cited Krauss et al. 2014 paper, is considered to have started ca 6200 cal BC (Kamjan et al. 2021). To the chronological time span of early Dzhulyunitsa could also be added some recently published dates: 6005 cal BC (on directly-dated bone samples – Krauss 2023, 238, Table 5) and 7599 BP or 6446 cal BC as a selected single date on a *Sus* bone (*vide infra*, Krauss 2023, 244, Table 7). The previous radiocarbon calibration model (based on Krauss et al. 2014) provides the boundary model for Dzhulyunitsa I and II as 6020–5970 cal BC (1σ), despite the earliest date of 7588 BP (6470/6420 cal BC [1σ]) (Thissen, Reingruber 2017, 161).

1.1. NEOLITHIC DIFFUSION: SELECTED MODELS AND TIME SPAN

This apparent discrepancy in dates requires a more comprehensive framework for Neolithization. In my view, a good starting point is the 2025 edition of the map of the expansion of Farming in Western Eurasia by Gronenborn et al. (fig. 2). For a regional (Balkan) perspective, the book by R. Krauss on the Dynamics of Neolithization in Southeastern Europe, cited above, provides the most recent and detailed dataset to which I shall refer in this study (Krauss 2023). It is far beyond my goal to go into the details of the viral Neolithization debate, which becomes increasingly complex and perplexing the more archaeological evidence is acquired and the more specialists feel inclined to contribute to it. My concern with the problem is to find a satisfactory explanatory model for the Neolithic expansion into the Balkans, and particularly Bulgaria, which does not contradict the radiocarbon dates and the established corpus of analyses and interpretations of the relevant sites, and which harmonizes with the issues raised by the chipped-stone assemblages, and especially with the questions raised by the Balkan flint investigations.

Such a model is represented by R. Krauss (and team) as a rapid spread of early farming from the Aegean into the Balkans via the Sub-Mediterranean-Aegean (SMA) vegetation zone following the climatic fluctuations during the 8.2 ka event (Krauss 2023; Krauss et al. 2017). This biogeographic region "…covers the northern and northwestern edge of the Aegean, including Thessaly, Greek Macedonia and Greek Thrace, and extends further into the Balkans, but only along the valleys of the Vardar (Axios), Struma (Strymon) and Mesta (Nestos) rivers. Surprisingly, although Thrace is the nearest landscape to Anatolia, it does not contain any sites of the earliest phase of the Neolithic beyond the narrow zone of northern Marmara" (Krauss et al. 2017, 1). The easily anticipated route out of northwestern Anatolia is conceived of as compromised because of the late establishment of a Neolithic population in Thrace (ibid., 3). It is noteworthy that this statement, based on objective evidence, is not inconsistent with a northward movement along the Black Sea coast, establishing settlements that are now submerged (*vide infra*).

The SMA zone and the clusters of sites derived from its spread along the three river valleys (above-mentioned) northwest of the Aegean are presented in fig. 3. The map with the earliest ^{14}C dates illustrates the Neolithic dispersal in fig. 3.1. The regional dispersal of the Neolithic by subdivision of 9 geographic units (zones) is presented in fig. 3.2. The largest cluster embraces the northeastern Serbian sites (including those in the Iron Gates); the second, smaller cluster further to the east comprises the earliest Neolithic sites in north-central and northeast Bulgaria,

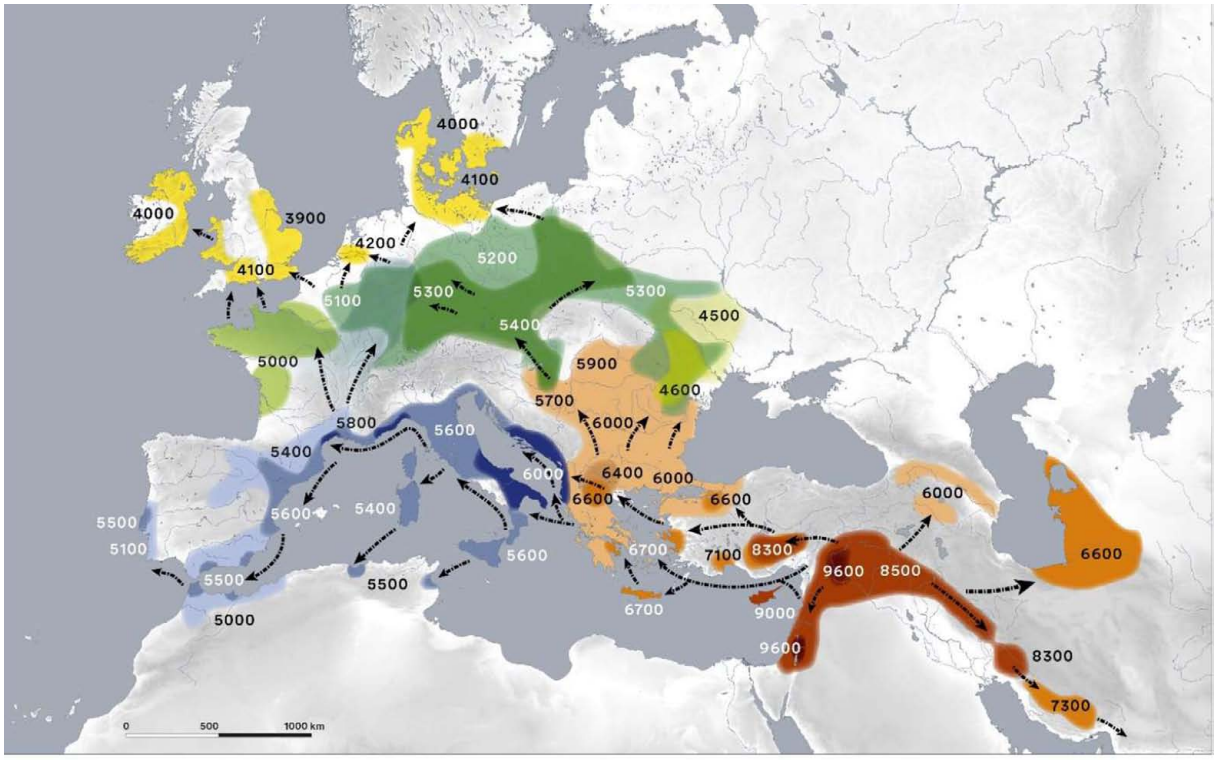


*Fig. 2. Map of the expansion of farming in western Eurasia, 9600–4000 BCE. Source: Gronenborn et al. 2025, accessed at 12.09.2025; https://www.academia.edu/9424525/Map_Expansion_of_farming_in_western_Eurasia_9600_4000_BCE_update_vers_2025_1_*

Dzhulyunitsa, Polyanitsa, Orlovets and Koprivets. It is unclear how the colonists reached this locality; the itinerary extends further south than the Danube, but following the river downstream is also easily envisaged. In any case, this presumption revitalizes Todorova's scenario of an Iron Gates origin for the first settlers of northern Bulgaria and the secondary Neolithization of Thrace (Todorova, Vajsov 1993). The zones with Bulgarian sites are as follows:

- Zone 3 encompasses the modern countries of Albania and North Macedonia, along with the catchment area of the Struma in southwest Bulgaria, bordering in the east;

- Zone 4 comprises the historical territory of Thrace;

- Zone 6 describes the regions along the lower course of the Danube, namely northern Bulgaria and Wallachia (Krauss 2023, 239).

Based on the selected single radiocarbon date for the beginning of the Neolithic per site (ibid., 242, 244, Table 7), the following dataset is suggested (only sites associated with the current research are presented here):

Zone 3

Galabnik (wood) – 7140 BP, CalPal (source), 2sigma 6031.5 cal BC

Kovachevo (seed/fruit) – 7245 BP, CalPal (source), 2sigma 6123.5 cal BC

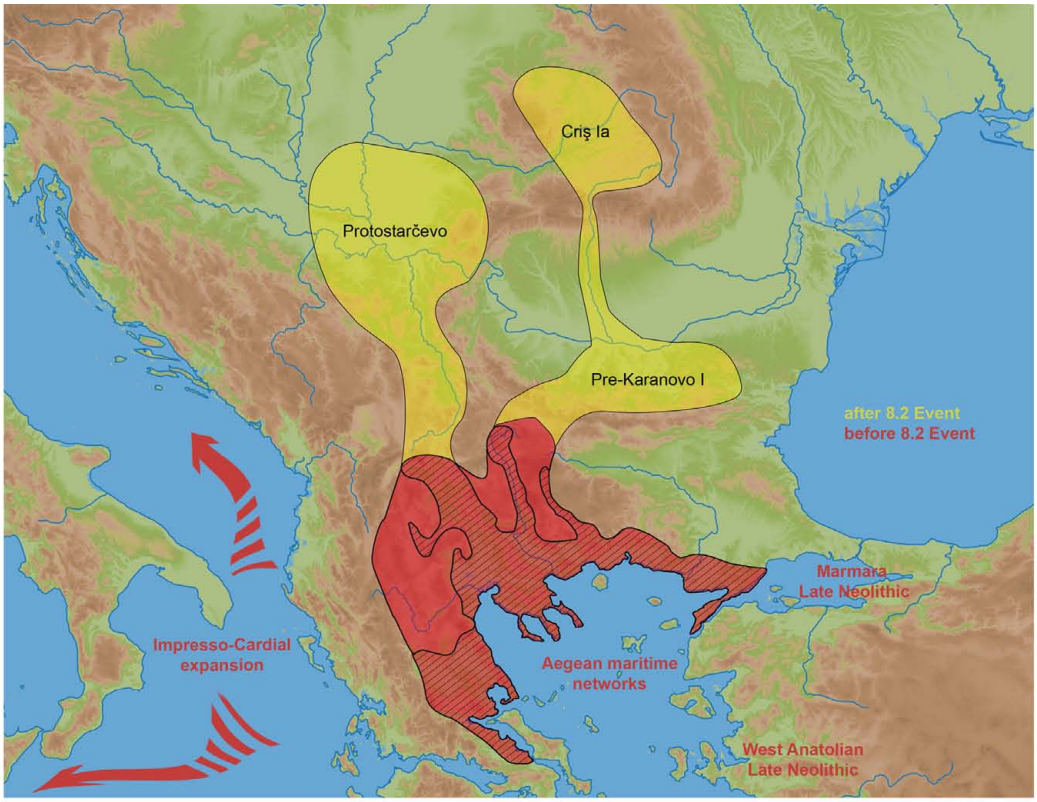
Zone 4

Azmak (charcoal) – 7303 BP, CalPal (source), 2sigma 6172 cal BC

Karanovo (charcoal) – 7130 BP, CalPal (source), 2sigma 6028.5 cal BC

Nova Nadezhda (bone) – 6979 BP, CalPal (source), 2sigma 5866 cal BC

Slatina (charcoal) – 6970 BP, CalPal (source), 2sigma 5857.5 cal BC



1



2

Fig. 3. Balkan Neolithization via the sub-Mediterranean-Aegean vegetation zone during the 8.2 ka event (1); Zoning of the radiocarbon dates in Southeast Europe (2) (after Krauss, R. 2023, figs 63 & 199, original maps – courtesy of R. Krauss)

Yabalkovo (bone) – 7040 BP, CalPal (source), 2sigma 5916.5 cal BC

Zone 6

Dzhulyunitsa (bone, *Sus*) – 7599 BP, CalPal (source), 2sigma 6446 cal BC

Varbitsa (bone, *Ovis/Capra*) – 6895 BP, Krauss book (source), 2sigma 5799 cal BC

Ohoden (bone, *Homo*) – 7060 BP, CalPal (source), 2sigma 5931 cal BC

Koprivets (bone, *Bos*) – 7090 BP, CalPal (source), 2sigma 5920.5 cal BC

The earliest date of Dzhulyunitsa is strikingly early compared to other sites, and this could be explained by the fact that the sample is a pig bone. I also include the published date of Nova Nadezhda as evidence that there are still no surprisingly early (earlier than Tell Karanovo) new dates from Thrace.

Some clarification of the ambiguous term 'pre-Karanovo' is warranted, both in terms of the lithic assemblages and more broadly. It implies a period earlier than the beginning of the Karanovo cultural sequence (i.e. older than 6000 cal BC) with distinctive technological and social characteristics. It extends beyond arguing for the absence of an initial "monochrome" stage in the Balkan Neolithic (in its conventional sense of "before painted pottery"). This term has been criticized as 'erroneous' in relation to the earliest pottery in the Lower Danube region (Thissen, Reingruber 2017, 160). However, the term is still widely used, and no more appropriate and accurate label has been suggested.

How do I assume the proxies for further research?

- The intensive research of the last few years has revealed significant new evidence for Early Neolithic settlements in various landscapes and environmental niches, which could undoubtedly be reflected in a more active and timely publication of a new series of radiocarbon dates (including in the Excel spreadsheet www.14SEA.org) to make them usable in the Neolithization debate;

- The traditional scenarios of the Bulgarian Neolithic (based mainly on 20th-century pottery studies) are no longer unambiguously supported by the available radiocarbon data (hence the importance of the previous paragraph), nor by the serious analytical research on Balkan flint, which does not lose its reliability and significance and should not be ignored or marginalized;

- There are several promising trajectories in desirable and necessary further research: a consideration of the new radiocarbon dates from sites in northwest Bulgaria (e.g., Ohoden, Mayor Uzunovo), from Kovachevo (in the Middle Struma Valley) and from Nova Nadezhda (in Bulgarian Thrace). These regions are deeply involved in at least one of the conventional scenarios of Bulgarian Neolithization. They may have played a crucial role in rethinking the first and successive demic migrations of Neolithic newcomers from their Anatolian homeland and secondary residential colonies along their remarkable agropastoral journey.

2. LITHIC TRAJECTORIES TO NEOLITHIZATION

2.1. EARLY NEOLITHIC FLINT ASSEMBLAGES: BACKGROUND AND EMERGENCE

The emergence of Neolithic flint assemblages in Bulgaria corresponds to the earliest evidence of the Neolithic lifestyle and of other elements of the variable and flexible Neolithic "package". Many previous publications on the earliest chipped-stone assemblages highlight their first manifestation within the already developed Neolithic features and without any captive relation with a presumed/preconditioned pre-Neolithic substratum (Гацов 1992a–b; Гюрова 2005; Gatsov

1993; 2006; Gurova 2005a; 2008a, c–d; 2009; 2018b; Gurova, Bonsall 2014a). This convincing and indisputable fact does not disregard but, on the contrary, provokes the unequivocal question of the missing Mesolithic in Bulgaria.

In the 1970s and 1980s of the 20th century, the Group for Palaeolithic Research at the Archaeological Institute in Sofia conducted surveys (primarily in caves) to identify reliable Pleistocene sequences for subsequent Palaeolithic research. Many caves and some open-air sites have been discovered and registered as potential archaeological sites; however, none have yielded traces of Mesolithic occupation. Thus, the practical issue of the extensive search for the Mesolithic in Bulgaria remains negative, although Gatsov has addressed the problem of the non-existent Mesolithic in several early publications (Гацов 1984, 1992; Gatsov 1982, 1984, 2006). The study of the surface collections (consisting primarily of microlithic artefacts) of the Dikilitash complex (Dekilitazh in his writings)[2] led him to conclude that the collection belongs to various periods and that the northeastern Bulgarian coastal area has been in the sphere of Tardigravettian/possibly Epi-Tardigravettian techno-complexes and represented its easternmost barrier (Gatsov 1982, 120). Furthermore, Gatsov presumed that the microendscrapers of the Usoe culture could be matched by indigenous counterparts in the Dikilitash microlith assemblage (ibid., 126). The origin of the bearers of the microlithic component, according to Gatsov, lies in the migration of groups from the Iron Gates region, which movement extended to the east, reaching "… Romanian Moldavia and the northeastern Bulgarian coast" (ibid., 129). Presumably and somewhat curiously, this Usoe, interpreted in the context of the earliest Neolithic assemblages in northeastern Bulgaria, is the 'Ousoe' later published as a Late Neolithic complex with very peculiar typological characteristics (Gatsov 1990). Pobitite Kamani (also known as Dikilitash), a numerous assemblage (numbering *ca* 12,500 artefacts) is treated in more detail in two publications (Гацов 1984; Gatsov 1984). More than half of the cores are described as being double-platform with bipolar debitage on a common removal surface. The predestination of the cores is evident in the removal of bladelets and microbladelets, which were subsequently transformed into microlithic tools, represented by variously backed bladelets, which are treated as common in the European Mesolithic and the Tardigravettian complex (Гацов 1984, 15). Considering the parallels between the Dikilitash cores and those from Usoe in northeastern Bulgaria, Gatsov concluded that the Dikilitash complex could be dated to the beginning of the Atlantic period and may be synchronized with the Late Mesolithic of Southeastern Europe (ibid., 16). Gatsov's 'remarkable capacity' to demonstrate parallels of artefacts of Dikilitash with Mesolithic assemblages from Vlasac and Cuina Turcului, and on the other hand, with Late Neolithic collections such as Usoe and Kachitsa in north Bulgaria, is recently recalled by R. Krauss (Krauss 2023, 46–47).

As it was already stated in a previous publication (cf. Gurova, Bonsall 2014a), Pobitite Kamani (Dikilitash) is generally regarded as a complex of sites, with material from various periods (fig. 4). Among the artefacts from Dikilitash is a series that has been attributed to a Levalloiso-Mousterian (Middle Palaeolithic) industry (Ivanova, Sirakova 1995, 44). Later, the collection from Dikilitash housed in the depositary of the Archaeological Institute in Sofia was studied by S. Ivanova and Ts. Tsanova (Иванова, Цанова 2001). Judging from illustrations in Ivanova and Tsanova (2001, Pl. VII), there are also several fragments of bifacial arrowheads, which in the Bulgarian prehistoric sequence cannot be earlier than late Chalcolithic and which

2 Gatsov studied the assemblages of the private collection of Ara Margos, completed by his surveys in the region and identifying 11 points of scatters (see Гацов 1984).

became a diagnostic type in the Bronze Age (cf. Гюрова 2005). Most interest, however, has focused on the presence of microliths, which include trapezes, triangles, segments, and backed and truncated bladelets. Gatsov (1982) compared the straight- and arch-backed microliths with the material from Cuina Turcului in the Iron Gates, concluding there was a 'Tardigravettian' or 'Epi-Tardigravettian' component among the Dikilitash finds. Ivanova and Tsanova (Иванова, Цанова 2001, 50) described the same material as 'Tardigravettian', while Kozłowski (1982, 149) defined it as 'early and middle Epipalaeolithic'. While there may be differences in terminology, all these authors seem to agree that the straight- and arch-backed microliths from Pobitite Kamani are Late Pleistocene and/or very Early Holocene in date. Of more immediate interest is whether the Dikilitash 'palimpsest' has a Late or Final Mesolithic component. Among the microliths illustrated by Gatsov (1982, pl. II) are some symmetrical trapezes made on blades, which he interpreted as Late Mesolithic. Although blade and trapeze industries are known from very late Mesolithic (post-6700 cal BC) contexts along the Adriatic rim of the Balkans (Perrin 2012) and in the steppe zone to the northwest of the Black Sea, especially the Late Mesolithic Grebenyky culture (Biagi, Kiosak 2010), in the Balkans east of the Dinaric mountains (including the Iron Gates) symmetrical trapezes made on blades are only well documented in the early and middle Neolithic (more details on the microliths in Bulgarian Neolithic assemblages can be found below – in the sections 3.1.1 and 4.2.1 of Part I, and 1.2 of Part III). In light of recent research on Late Neolithic assemblages, neither small bladelet cores nor the geometric microliths can be securely attributed to pre-Neolithic periods. Ergo, part of the Dikilitash collection can be affiliated with the Late Neolithic industry/technocomplex.

It is noteworthy here that in his later works on assemblages from northwestern Anatolia, Gatsov does not omit to address the problem of the Mesolithic-Neolithic transition, postulating the specificity of the Bulgarian Early Neolithic industry from Thrace as 'macro blade technology' with unknown origin against assemblages from northwestern Anatolia with a different typological repertoire (Gatsov 1995; 2005; 2007). Later on, this Mesolithic-Neolithic transition and the "technological gap" between the Epipalaeolithic/Mesolithic assemblages from Bulgaria (Dikilitash) and the Turkish Black Sea shore, and from them both and the Early Neolithic Upper Thrace assemblages have repeatedly been interpreted (unavoidably!) through the lens of the bullet core reduction sequence (e.g., Gatsov 2005). As the essence of his reasoning and conclusions on this priority topic, two sentences could be cited: "Based on the occurrence of bullet cores, it could be presumed that more or less similar technological features in core reduction processes were practiced in the 7th–6th millennium cal BC in the northwest Pontic region, eastern Thrace, and the south Marmara region"… "The only exception is the Bulgarian Black Sea shore and northern Thrace, whereas in the regions of eastern Thrace and south Marmara this technique is dominant. The occurrence of bullet core techniques therefore suggests the existence of some local element in the formation of the Neolithic flint industries" (Gatsov 2007, 126). In fact, the bullet core reduction system goes far beyond Gatsov's focus. It traces its origin not in local pre-Neolithic backgrounds but in pressure-blade technology, which most probably emerged in eastern Mesopotamia at the end of the 10th millennium cal BC, and through eastern Anatolia and Cappadocia reached central Anatolia and the Lake District, around the middle of the 7th millennium cal BC (Baykal-Seeher 1994; Balkan-Atlı 2005; Binder 2007). Regarding the 'local' Mesolithic character of pressure-knapping in northwestern Anatolia, the lack of a secure context has led some specialists to suggest its central Anatolian (Lake District) origin (Altınbilek-Algül et al. 2012, 177; Binder et al. 2012, 214).

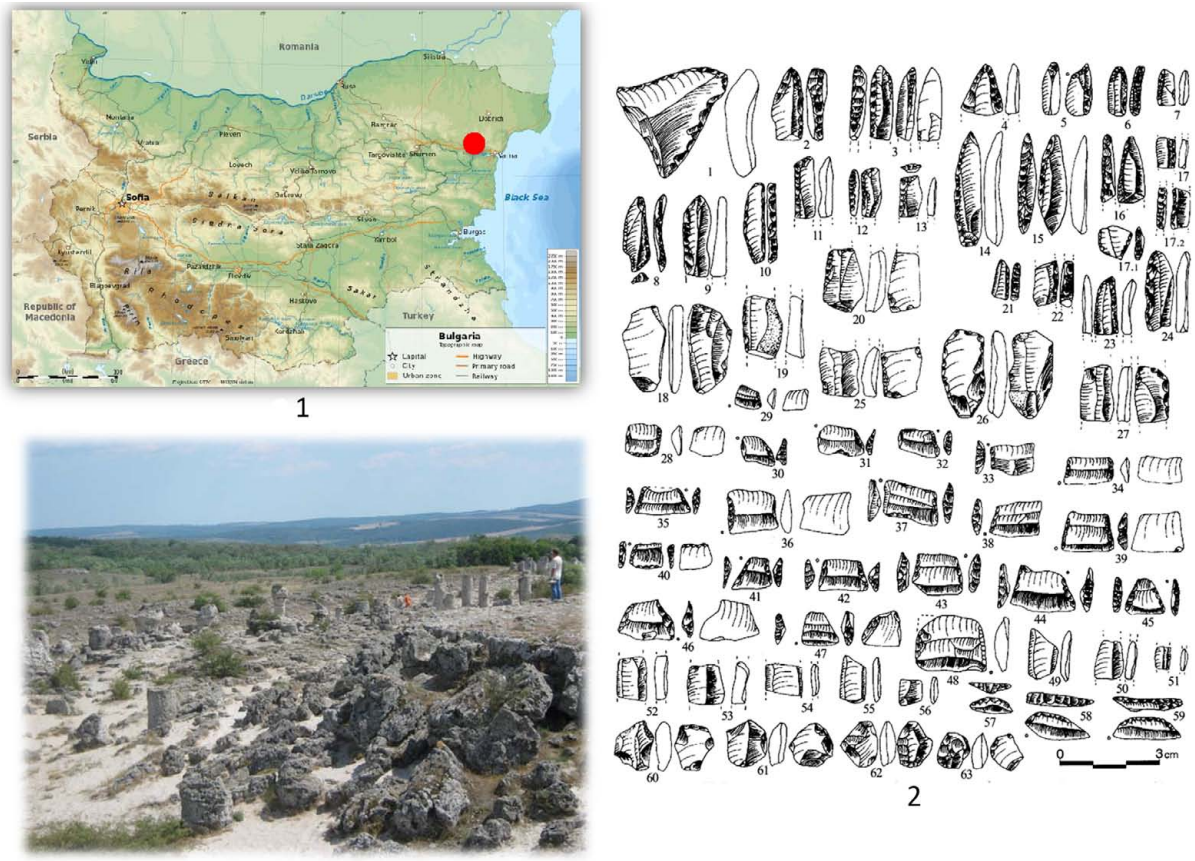


Fig. 4.1. Location and view of Pobitite Kamani (Dikilitash); 2. Flint industry from Dikilitash (after Иванова, Цанова 2001, fig. VI) (reproduced fig. 2 from Gurova, Bonsall 2014a)

2.2. MESOLITHIC: VIRTUALLY PRESENT OR ABSENT … AND NEOLITHIZATION

Gurova and Bonsall addressed the Mesolithic problem in a publication that has had a strong echo within the Mesolithic scholarly community (Gurova, Bonsall 2014b). The leading argument behind this paper is based on the idea that "absence of evidence is not evidence of absence", bearing in mind the relative nature of the notions in this wordplay. Two crucial datasets are taking into consideration: i) the very instructive mapping of Mesolithic and Upper Palaeolithic sites in the Balkans showing strikingly different distributions – extensive dispersal of the Upper Palaeolithic settlements in caves and rockshelters, including deep into the mainland/interior against the peripheral location of the Late Mesolithic sites, most being near the sea or the Danube (ibid., 97, fig. 2); ii) palaeovegetation records for the region suggesting ecosystem fluctuation and significant expansion of temperate forest and canopy cover during the Early Holocene. In these circumstances, where reduced biomass unavoidably affects the hunting capacity and relative efficiency of aquatic resources, fishing emerges as an alternative subsistence activity, predetermining the relocation of sites and facilitating intergroup communication (cf. Gurova and Bonsall 2014b, 97–98 and references therein). In this context, "The Iron Gates sites have tended to be regarded as exceptional, yet paradoxically they may have been typical of Mesolithic and Early Neolithic coastal adaptations in Southeast Europe"… "Many Mesolithic coastal sites would have been inundated by the Holocene marine transgression. But sites like Schela Cladovei and Vlasac in the Iron Gates were perhaps typical of the Late Mesolithic fishing villages that once existed along the length of the Lower Danube and the Black Sea coast" (ibid., 99, 104). Theoretically, e.g. "beyond the boundaries of empirically-based hypothesis",

fishing villages or hamlets like those in the Iron Gates likely existed along the Bulgarian section of the Lower Danube, as well as in protected embayments, lagoons and river estuaries along the Black Sea (in the concrete case). And if we want to seriously search for the remains of pre-Neolithic (Late Mesolithic) and very early newcomers/farmers, we should explore the submerged Black Sea coastal plain and sloping southern banks of the Danube, as suggested by D. Bailey (2007, 521).

Within the framework of Neolithization, the model of interactions between the small dispersal clusters of Late Mesolithic sites in the Balkans with the expanding farmers coming from Anatolia varies from region to region. Far away from the territory in question, but well documented and discussed by J.K. Kozłowski, is the openly maritime aspect of Aegean Mesolithic communities who were involved in contacts with PPN populations on Cyprus (that is factually questionable!) resulted in the appearance of a complete Neolithic package in some of the groups as Franchthi, phase X and Knossos Layer X. Apart from diversity, the Mesolithic communities were united by Melian and Ghiali[3] obsidian distribution and use, and subsistence activities based on foraging, fishing, small game hunting, and plant collecting (Kozłowski 2016, 61).

Further northeast, a complex and complicated interaction between Mesolithic and Neolithic communities is recorded in the Circum–Pontic region (southern Ukraine) (Kiosak 2016). The author proposes a conceptual and interpretive reconsideration of the Mesolithic–Neolithic transition, along with more adequate terminology to reveal various 'interfaces' between Mesolithic communities, particularly the riverine ones (Bug-Dniester and Kukrek cultures, for example), with migratory phenomena such as Criş and LBK (ibid., 143–144).

In the Balkans, the most notable and enlightening phenomenon is, of course, the Iron Gates, where Mesolithic evidence and the emergence of Neolithic cultures are best presented, yet some discussion points remain. The opportunity to use various lines of archaeological evidence (burials, architecture, pottery, lithics, artistic depictions) and to conceive the evolution of the material culture and social organization diachronically (based on sites with Mesolithic and Neolithic sequences) offered possibilities for multidisciplinary analytical research and conceptual interpretive publications (Bonsall 2007; 2008; Bonsall et al. 2008; 2000; Borić 1999; 2005; 2007; 2011; Borić, Miracle 2004; Ciocani 2016; Brami, Diekmann 2024). The critical issue of the latest revisiting of the Iron Gates as a 'hybrid cultural world' is the statement confirming cited above from Gurova & Bonsall that "Rather than seeing this region as an exception to the general rule of Mesolithic–Neolithic transformation processes in Southeast Europe, we argue that it probably represents a rare window of opportunity for understanding the typical process of transformation characteristic" (Borić, Cristiani 2022, 336).

In the early studies of chipped-stone assemblages from Lepenski Vir and Vlasac, there are many postulates (some already anachronistic) that dominate(d) the prehistoric Balkan lithic agenda (Kozłowski, Kozłowski 1982; 1984). These studies introduced some conventional conceptualizations of the Mesolithic and early Starčevo complexes in terms of chipped-stone assemblages, which focus mainly on standardization and typological grouping, and are considered applicable to a broader complex of assemblages, such as Divostin, Anzabegovo and Golokut. Lepenski Vir layer I is distinguished as the Lepenski Vir culture with an undoubtedly pre-Neolithic character and includes the industries of Vlasac, Schela Cladovei and Ostrovul Corbului. The origin of this culture is rooted in the local Late Palaeolithic and Epipalaeolithic

3 Ghiali obsidian is reported by Kozłowski as found at some Cyclades and northern Sporades sites (Kozłowski 2016, 51).

industries. Chronologically, Vlasac and Lepenski Vir I date to the end of the 7th millennium BC and "sprang up within the widespread Epigravettian tradition of the Balkan type (Kozłowski, Kozłowski 1982, 106). Lepenski Vir III is described as being closer to the Starčevo–Köros complex (Kozłowski, Kozłowski 1984, 275). As for the Lepenski Vir sequence, there is confusion in the chronological position of these distinct Lepenski Vir units. On the one hand, a hiatus is noted between them, and Lepenski Vir I is pre-Neolithic. On the other hand, it is stated that it should be synchronized with the Starčevo complex because raw material was brought to Lepenski Vir I "by the population of Starčevo culture" (Kozłowski, Kozłowski 1984, 278). The last decade of re-examination and re-evaluation of the Lepenski Vir archaeological records has shown that Lepenski Vir phases I and II correspond with the start of the Meso–Neolithic transition period, followed by a break (hiatus in Kozłowski & Kozłowski's understanding) and resettling of the site between 6170 and 6017 cal BC (Borić, Cristiani 2022, 324). Whatever discrepancy may emerge between the time of publication of the chipped-stone assemblage from Lepenski Vir and subsequent reinterpretation, the forager community of the transitional phase I–II had already been in contact with the Neolithic community (Starčevo bearers of Balkan flint to Lepenski Vir I in Kozłowski's narrative). A critical issue in the Lepenski Vir research is the presence of high-quality exotic flint from the beginning of the sequence. This flint is referred to as Balkan flint, and its proportion in layer I is 5.39% (ibid., 261, Table I). Its origin is presumed to be… "in the region of Mesozoic sediments of pre-Balkan Platform" (ibid., 260). This wax-coloured flint attains a proportion of 65.73% in Lepenski Vir III (ibid., 271, Table VI). Thus, Balkan flint 'occupied' its crucial place in Balkan prehistory narratives and will reasonably be presented in more details in the text below.

Here, I will be satisfied to highlight one work focused on a 'hidden reflection of Mesolithic continuity' in Serbia (Bogosavljević-Petrović, Starović 2016). Relict traces of the preceding Mesolithic human groups are evident in the plant economy, livestock/herding mobility, in the dichotomy of the bone/antler industry and in raw material distribution and use. Within the traditionally rooted Early Neolithic chipped-stone industries, Balkan flint is a new raw material, with significant implications for the Neolithic *chaîne opératoire*, as recognized at Lepenski Vir III and Padina B. In this role, Balkan flint… "presents an important potential "filter" for the recognising interactions between traditional foragers and newcomers to the Iron Gates region' (ibid., 34). This is one of the most meaningful contextual descriptions of Balkan flint. Renewed research on the chipped-stone assemblages from Lepenski Vir has reopened the question of the presence of Balkan flint artefacts in Mesolithic and Neolithic phases of the site, suggesting a "newly emerging identity shaped through ...the co-existence of hunter-gatherer and farming communities in Lepenski Vir" (Kačar 2025, 23). And it is reasonably noted in the cited paper that the Bulgarian provenance of the "Balkan flint" from different strata of Lepenski Vir should be established analytically, at least to shed light on the long-lasting narrative of its inherent association with Starčevo farming communities.

As for the Bulgarian lands, which by definition were treated as deprived of a pre-Neolithic substratum, the main and still conventional Neolithization scenarios suggested an inland spread from the northern Aegean following the Struma and Vardar River valleys with subsequent multidirectional dispersal (Николов 1987; 1990; Nikolov 2003; Lichardus-Itten 1993; Todorova, Vajsov 1993; Lichardus-Itten et al. 2002, 2006). Only a few researchers (e.g., Bailey 2007; Özdoğan 2006; 2011a–b) seem to have considered the possibility of a maritime spread along the (now submerged) Black Sea coast. However, in favour of this eventual Neolithization pathway there are lines of evidence, presented in the above-mentioned paper by Gurova

& Bonsall, which deserve to be recalled: i) the actual lack of Early Neolithic sites along the Black Sea results from geomorphological processes; it is a question of time, teams and new technologies to be discovered through underwater archaeology; ii) in neighbouring parts of western Anatolia (Fikirtepe, Yeşilova) and in the southern Balkans (Franchthi) the communities combine farming with the exploitation of coastal resources (see During 2011, Derin 2007 and Perlès et al. 2013); iii) according to radiocarbon records, most of the earliest known Neolithic sites in the Balkans (6100–6000 cal BC) are several centuries younger than the sites in Greece and the Aegean and on the other hand, they are similar to the ^{14}C dataset across the Balkans to Transylvania (from here the concept of 'cul-de-sac' about Bulgaria in the Neolithization). Thus, a presumed expansion along the Black Sea littoral with subsequent inland penetration via rivers – simultaneous with the Struma and Vardar River Valleys movement starting from the north Aegean – would fit better with the available radiocarbon dataset (cf. Gurova, Bonsall 2014b, 100). The direct route of Neolithic spread from northwestern Anatolia is proposed by J. Roodenberg, who viewed the Marmara region no longer as "a cul-de-sac, but as a passageway employed by migrating agriculturalists" (Roodenberg 2016, 4). In considering a marine expansion of the Black Sea as mediating contacts between northwestern Anatolia and the Danube, Özdoğan has stated that this option is seriously overlooked and that "regardless of the discussion on whether or not the Bosporus existed at that time, a sea route from the Istanbul region, going into the Danube by following the coastal strip along Bulgaria and then possibly going up to the Hungarian plain, has to be considered as one of the main routes for the Neolithization of Central Europe" (Özdoğan 2022, 412). Let us consider that before reaching the Hungarian Plain, the migrants had many opportunities to make brief turns into the Bulgarian interior and to find a suitable econiche for settling. The traces of their initial establishments, as highlighted above, could be on the actually submerged sea shoreline.

From a purely lithic point of view, it should be recalled that flint macroscopically similar to what was long considered and is already proven to be Balkan flint, is recorded among Gravettian and Epigravettian layers in Temnata Cave (Gurova, Bonsall 2014a, 110, fig. 3). Let us recall: "The detailed study of raw materials from the Gravettian sequence of Temnata Cave was undertaken by Maciej Pawlikowski. His conclusions about flint types were summarized thus:

> "The source of the wax-yellow BG-Te-F4 flints remains unknown. Field studies and the distribution of artefacts during the Early Neolithic allow us to suggest its origin from northwestern Bulgaria, southwestern Romania, or northeastern Yugoslavia (Iron Gates area). This hypothesis must be supported by more detailed field investigations (Pawlikowski 1992, 286)" (Gurova, Bonsall 2014a, 111).

Speculative, but not *a priori* rejectable, is the possibility that, still mysterious and unearthed, there existed a Mesolithic substratum that inherited and continued to operate with the Balkan flint network, acquiring and (why not?) distributing nodules and artefacts upstream along the Danube to Lepenski Vir. I partially agree with Demoule & Manolakakis' statement that "There is therefore nothing in the earliest Neolithic of the Balkan Peninsula that explicitly indicates contributions from the local Mesolithic. The only potential exception to this rule is the way Neolithic colonists obtained obsidian, which was already in use during the Mesolithic at Franchthi. It is therefore conceivable that there was some transfer of information and knowledge between Mesolithic and Neolithic groups" (Demoule, Manolakakis 2022, 355). I argue that, rather than obsidian, which is exceptionally scarce in the archaeological record in Bulgaria, the first Neolithic settlers may have opted for peaceful interaction with groups operating within pre-existing Balkan flint exchange networks. Once again, absence of evidence is not evidence of absence.

Two recent discoveries relate to the topic of the 'missing' Mesolithic and the potential of submerged sea coast exploration. R. Krauss recently published three radiocarbon dates from a peculiar find of three red deer antlers deposited in a pit at Ohoden (Ганецовски 2012). Dates calibration "… indicates the 67th century BCE as having been the period in which the animals lived". According to the author, this is "… the clearest find comparable to those of the Mesolithic on structural grounds" (Krauss 2023, 45). Being for the moment a Late Mesolithic feature unrelated to the explored Early Neolithic on the site, as further priority research by the excavators will be to look for the contextual background of the red deer antler structure and eventually – for some evidence of the relation between the Mesolithic structure and the Early Neolithic occupation of the site, which actually is more than 1000 years younger than the structure context (Ганецовски 2009). A serious challenge remains – to explain the fragment of Early Neolithic pottery and the zoomorphic figurine found in this pit/structure 18, as described by Ganetsovski (2012, 43–44). R. Krauss is convinced that "... Despite this, there is clear evidence for earlier, pre-Neolithic occupation of Ohoden on account of the deposited deer antlers" (Krauss 2023, 234).

The second discovery remains unpublished. ^{14}C dates falling in the 59th century cal BC came from the underwater settlement of Ropotamo[4]. The existing publication (Dimitrov et al. 2024) gives information on the intriguing features of the site. The forthcoming publication is eagerly awaited and will include a series of AMS dates and a more secure contextual interpretation. This site, as well as many others, remaining submerged, could (hopefully) offer even more convincing and challenging evidence of very early Neolithic habitations on the now inundated portion of the Black Sea coastal plain.

And last but not least, there is particularly intriguing evidence of hunter-gatherer-related ancestry in the individuals from Malak Preslavets (Mathieson et al. 2018, 199), a site considered as belonging to the Early Neolithic (Панайотов и др. 1992) with only a brief and confusing rather than informative information on this 'heterogeneous' flint collection, based on comparison of the assemblages with Dikilitash and the Iron Gates area (attributed to the Epigravettian technocomplex of Balkan type) and on the other hand, with the Late Neolithic assemblage from Usoe. However, the problem is correctly formulated, as there is still no clear evidence or interpretation of how the Epigravettian traditions reflect/influence the flint industry of later periods (Гацов 1992, 199). No illustration is provided for this contradictory description (possibly part of the gnoseological insignificance is due to the poor Russian translation of the text). Unfortunately, it does not seem realistic to expect new insights into the archaeological finds from this settlement, beyond the adjustment of the AMS dates.

2.3. BALKAN FLINT: SCIENTIFIC CHALLENGE AND TRAJECTORY TO NEOLITHIZATION

2.3.1. CONSOLIDATION OF BALKAN FLINT RESEARCH

More than a decade ago, I published the paper "'Balkan Flint' – fiction and/or trajectory to Neolithization: Evidence from Bulgaria" (Gurova 2012a). The paper was derived directly from an EAA session in Riva del Garda (Italy) entitled "Balkan Flint" in SE European Prehistory: Chronological, Cultural and Social Perspectives"[5]. The session aimed to clarify as much as pos-

4 Personal communication by the Director of the excavation Dr Kalin Dimitrov.

5 The session was organized by M. Gurova (Bulgaria), Clive Bonsall (UK), B. Voytek (USA) and D. Borić (Serbia/UK).

sible the ambiguity and speculation arising from the sporadic macroscopic descriptions used to determine this type of flint and the consequent indiscriminate, repetitive use of the term. Some aspects of this 'mythologization' were discussed. Some evidence of Balkan flint in the Balkan countries was presented and approved, and new research directions were formulated to turn the mythology into reality using reliable scientific methods. It should be recalled that in my previous research, the formal tools/toolkits fashioned on Balkan flint blades were defined and explained (Gurova 2008a) and that the role of flints in the general conceptualization of the Neolithic spread into the Balkans/Bulgaria is undeniably important and should not be marginalized anymore (Gurova 2009).

The paper focuses on the current state of research and knowledge about 'Balkan flint' and the trajectories stemming from the Balkan flint problem into the broader, increasingly complex issue of the Neolithization of the eastern Balkans. Upon re-reading this work, I cannot help but acknowledge that most of the complex Balkan flint enquiry is well presented, serving as a solid starting point for further long-term, serious research, whose analytical and conceptual results were summarized in the recently published paper "Balkan Flint in Perspective: Ten Years of Interdisciplinary Research" (Gurova et al. 2025). In the first paper (Gurova 2012a) a retrospective introduction briefly traced the emergence and consolidation of the Balkan flint problem within the research agenda of specialists working on Balkan prehistory: from Comşa who introduced the term "silex balkanique" (Comşa 1976, 240) through the 80s of the 20th century when the Balkan flint label largely appeared in the specialized literature, and especially in the publications of J.K. Kozłowski, who was at that time involved in different research projects in the Balkan area (Kozłowski 1982, 150; 1988, 561; Kozłowski, Kozłowski 1984, 260, 267). From there (as mentioned above), Balkan flint is thought to have originated in the pre-Balkan Platform/Plateau. B. Voytek assumed Shumen as the origin area (Voytek 1987, 293). Both suggestions were, in fact, correct, but from there to the secure identification of the Balkan flint source, there was still a long way to go…

What should be stressed is the terminological clarification which was provided in the paper (2012a) about the use and meaning of the French terms "silex blond", "honey flint" and "honey-brown flint", used for ex. by C. Perlès and L. Manolakakis (Gurova 2012a, 16–17 and literature therein). The latest justification of the ambiguous term of "honey flint" appears in a paper of C. Perlès, accompanied by contextual data on Early and Middle Neolithic blades from Greece, made of exogenous raw materials (incl. "honey flint"), with sufficient and till now missing colour illustrations, and a clearly defined future research agenda (Perlès 2026). The reflection of the Balkan flint problem in the more recent specialized literature took place in the paper (Gurova 2012a), together with a brief, but necessary, review of the Bulgarian geoarchaeological research on prehistoric raw materials mentioning the studies of the team of K. Kanchev & I. Nachev, the important for Palaeolithic research contribution of M. Pawlikowski (1992) and the very instructive and practically relevant paper of C. Nachev (Начев 2009).

Approaching one of the crucial problems – the provenance of Balkan flint, the paper correctly reflects the currently uncertain situation due to insufficient results from the first petrographic analysis (collaboration with C. Nachev) and the present author's (MG) supposition that Balkan flint may have sources in Ludogorie as well, based on the macroscopic similarity between the Balkan flint and Kriva Reka flint. The next step in methodological and practical search for better results led to collaboration with C. Bonsall for more reliable characterization of Balkan flint sources through trace element analysis using laser ablation inductively coupled plasma mass spectrometry (LA-ICP-MS) and electron probe microanalysis (EPMA). Samples con-

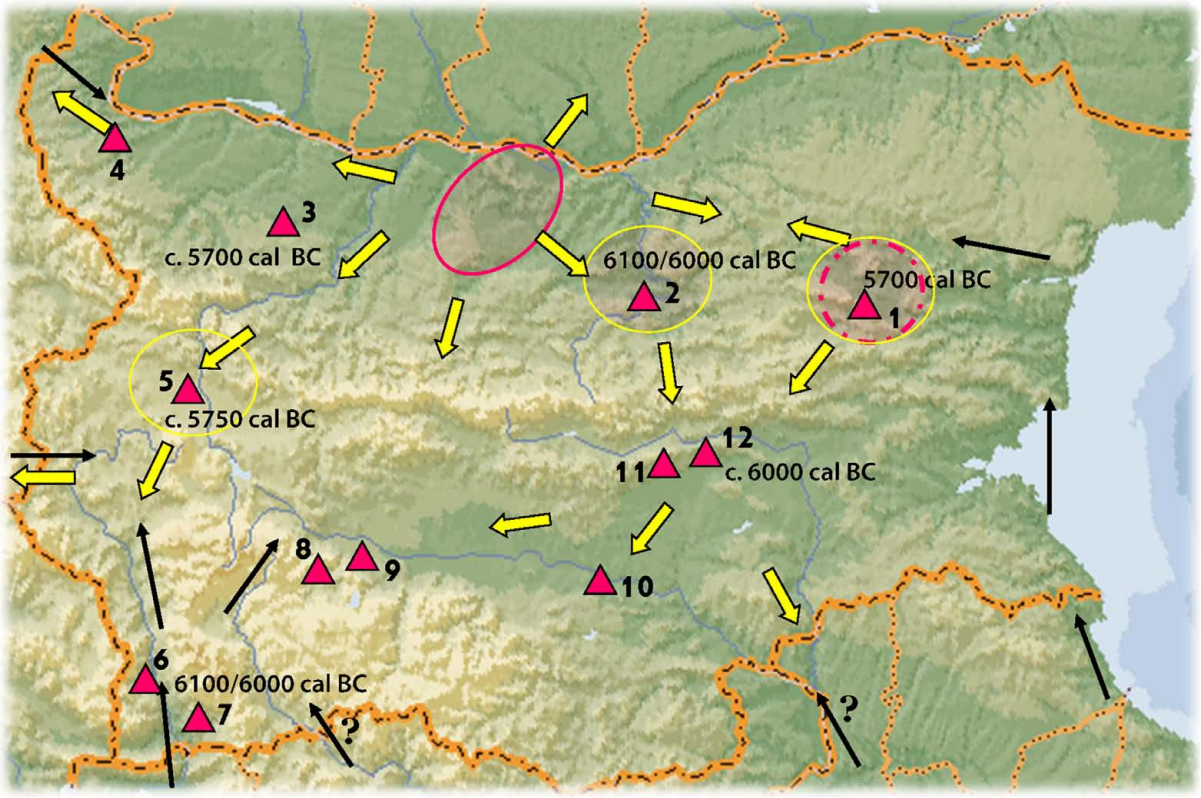


Fig. 5. Map of Bulgaria with the Early Neolithic sites mentioned in the text: 1. Varbitsa; 2. Dzhuljunitsa; 3. Ohoden; 4. Yarlovitsa; 5. Slatina (Sofia); 6. Ilindentsi; 7. Kovachevo; 8 . Rakitovo; 9. Kapitan Dimitrievo; 10. Yabalkovo; 11. Azmak; 12. Karanovo. ***Legend****: Black arrows indicate routes of Neolithization proposed by various authors. Yellow arrows mark Balkan flint distributions. The red ellipse marks the Pleven–Nikopol Balkan flint cluster; the red, dashed line circle shows the Shumen flints outcrop area; yellow ellipses indicate the hypothesized mediating centres of Balkan flint distribution*

tained Moesian and Ludogorie flints as well as artefacts from seven Early Neolithic sites: five in Bulgaria (Ohoden, Slatina, Dzhulyunitsa, Yabalkovo and Kovachevo), plus Schela Cladovei in Romania and Aria Babi in Serbia. The results suggested that more than one source of Balkan flint had been used and that most of the geological samples (particularly those from Ludogorie flint differ from the artefacts. The most important conclusion was that "The results suggest that successful provenancing of flint artefacts is unlikely to be achieved through chemical analysis alone, and future research on the 'Balkan Flint problem' will doubtless require the use of other techniques, such as petrographic and micropalaeontological analyses, in combination with trace element studies" (Bonsall et al. 2010, 13).

The Balkan flint paper (Gurova 2012a) was important because it consolidated thoughts, ideas and trends that fuelled further research on Balkan flint. Its enquiry included not only specific identifications of the sources, but also the incorporation of the results into the viable Neolithization debate, based on the fact that Balkan flint certainly appeared and played a role in the establishment and operation of the Early Neolithic Balkan *oikoumene* and its networks. And now, having many crucial results available, I cannot deny that my anticipation about Balkan flint provenance in general and its distribution among the known Early Neolithic sites containing its artefacts was quite correct. From the outset, it was clear that the Balkan flint outcrops were located in north Bulgaria, whereas the Thracian plain, which is devoid of flint that competes with Balkan flint, represents the largest arena for the Early Neolithic manifestation of Balkan flint formal toolkits and other Early Neolithic material culture paraphernalia.

At the end of the paper, the main Neolithization scenarios are summarized and commented upon: i) diffusion of farming from the north Aegean via the Struma River Valley (the scenario with most proponents); ii) via the Vardar and Morava to the Iron Gates and then along the Danube downstream movement to north Bulgaria, before Thracian colonization by the same enclaves, and iii) northward spread from northwestern Anatolia, penetrating the Ludogorie region and turning west up the river, bypassing the interior of Bulgaria (see details in Gurova 2012a, 40–41). Apart from the Struma pathway, in both others, in my view (at the time of paper writing, more intuitively than seriously argued), I presumed a crucial mediating role for the site of Dzhulyunitsa in the acquisition and subsequent distribution of Balkan flint to many site consumers. This hypothesis remains vital and has been shared in other publications (Gurova 2012b, Gurova, Bonsall 2014a, etc.) (fig. 5). However, the question I addressed at the end of the paper in 2012 remains challenging and unresolved. Who **were** the new flint knappers, and **from where** did they come, bringing the know-how of quite large Early Neolithic Balkan flint blade production? With further research, this question has been explored through several proxies, some of which will, hopefully, be answered in the exposé below.

2.3.2 BALKAN FLINT PROVENANCE STUDIES: AN INNOVATIVE INTERDISCIPLINARY APPROACH

Between 2011 and 2023, five field surveys were carried out, accompanied by consecutive Laboratory analytical procedures. Very helpful in our geological prospections were the unpublished notes of K. Kanchev and I. Nachev, which we were allowed to use and which we always cited in our publications. This innovative and promising approach was initiated and carried out with the fruitful collaboration of colleagues from the Geological Institute, BAS: Dr Polina Andreeva and Dr Elitsa Stefanova, who performed the entire analytical procedure using facilities in their Institute. From the NAIM, apart from me as the leader, others who contributed at different stages of the work were Dr Andrei Aladzhov and Dr Nadezhda Kecheva. An external member of the team was Professor Clive Bonsall from the University of Edinburgh. Together, over more than a decade, we practised a pioneering approach leading to notable advances in Bulgarian raw material studies. This approach combined fieldwork sampling, macro- and micropetrography, with geochemical (LA-ICP-MS) analysis of raw material samples and flint artefacts. Based on five systematic field surveys to identify and record raw material outcrops, we selected 64 geological samples for comparison with 166 artefacts from archaeological sites (Table 1). All stages of our analytical procedure – from fieldwork to the combined analytical results and database creation were meticulously documented. The results of this research have been presented in open-access publications and constitute a coherent corpus of analytical data that can be integrated into future collaborative research projects (Andreeva et al. 2014; Gurova et al. 2016; 2021b; 2022a–b; 2024; 2025).

- Our first survey in north-central Bulgaria was the most productive and resulted in detailed documentation and identification of clusters of Balkan flint outcrops in the Pleven–Nikopol region (Гюрова и др. 2012 a–c; Gurova et al. 2016). The Upper Cretaceous flint-rich rocks formed large areas of outcrops in north Bulgaria (the Moesian Platform and adjacent parts of the Balkan Alpine Orogen, but only in the Pleven–Nikopol region is Moesian flint (*sensu* Nachev 2009) hosted in non-deformed rocks. The most securely identified outcrops occur in chalky limestones of the Upper Cretaceous Mezdra (siliceous-carbonate) Formation (fig. 6). Secondary eluvial, diluvial and alluvial flint deposits in the area were formed due to destruction and disintegration of the same limestones, which contained flint concretions. The latter are of-

Table 1

Campaign	RM samples	Artefacts	Total	Location
2011	11	21	**32**	North-central Bulgaria
2012	10	21	**31**	Northeastern Bulgaria / Ludogorie
2018	20	10	**30**	Northeastern Bulgaria / Shumen district
2021	8	22	**30**	Northwestern Bulgaria / Vidin district
2022	5	77	**82**	NAIM Project
2023	10	15	**25**	North-central Bulgaria
Total	64	166	**230**	

Table 1. Number of samples subjected to petrographic and geochemical analysis

ten visible as flint pebbles and cobbles within slightly consolidated or unconsolidated breccias and conglomerates. We visited numerous secondary and primary deposits of the Mezdra siliceous-carbonate Formation in the Pleven district with high-quality flint raw material. This flint type displays mostly irregular shapes and is characterized by various colours (beige, yellowish-light brown, rarely dark brown) and nodule sizes (mainly 10 to 40 cm). The geological samples from the most prominent outcrops and artefacts from seven archaeological sites, compared to the selected raw materials, were subjected to archaeometric study (fig. 7). Of the Balkan flint outcrops identified, the most promising are Zhernov (*vide infra*) and the chalk deposits to the west and southwest of Nikopol along the road (II-34) to Pleven and upstream to the Danube, where many geological exposures with flint concretions were recorded. Numerous secondary placer deposits of flint nodules on the Danube bank near Nikopol were recorded too (Gurova 2012a, fig.13). Despite the recognition of at least one outcrop with unmistakable evidence of exploitation during the Holocene (Zhernov outcrop, near the eponymous village), no workshop site with characteristic debitage of Balkan flint procurement and artefact production has been identified so far.

- Our second campaign extended the survey to northeastern Bulgaria – the Ludogorie region, where the best quality Ludogorie flint is located, hosted in Lower Cretaceous micrite limestones with many different types of placer deposits (fig. 8). The flint raw material occurs predominantly in secondary eluvial, diluvial and (paleo)alluvial deposits (Гюрова и др. 2013; Andreeva et al. 2014). Apart from two well-known flint types, Ravno and Kriva reka, our analysis allowed the distinction of a new flint type (Krasen type with poor knapping properties) and two subtypes of Ravno flint. Micropetrography and trace element analysis unequivocally demonstrated differences between Balkan flint and the Ludogorie flints as well as between the Ravno type (with subtypes) and the Kriva reka type, which macroscopic features initially led me to suspect a Ludogorie origin for Balkan flint. Ludogorie flint is distinct from Balkan flint in both *sensu stricto & lato*. Still, there are consistent mistakes in the archaeological literature, particularly among scholars working in Romania (for more details, see Gurova et al. 2025, 20).

- Apart from the Pleven–Nikopol outcrops cluster, another part of what Nachev called Moesian flint remained insufficiently studied in northeastern Bulgaria − Shumen district, southeast of the principal area of the Lower Cretaceous Ludogorie flint where our third campaign was carried out (Gurova et al. 2022a). To reiterate, a retrospective examination of the various hypotheses regarding the yellow, white-spotted flint, recognized among assemblages of the supra-

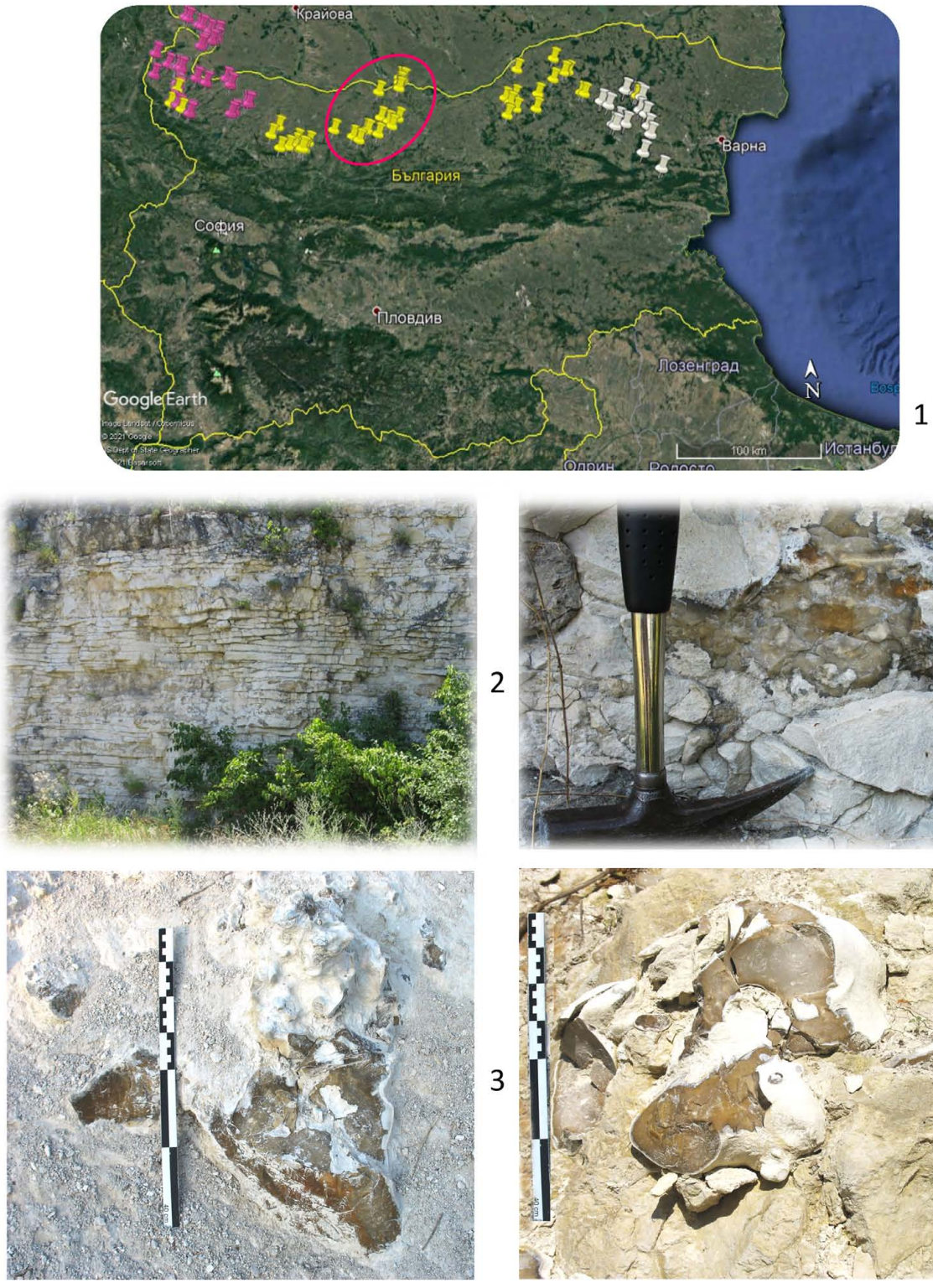


Fig. 6. Regions with the locations of our field surveys (in different colours). The Pleven–Nikopol cluster of Balkan flint outcrops is marked by a pink ellipse (1); Upper Cretaceous Mezdra (siliceous-carbonate) Formation near Gortalovo and flint concretion from there in primary position (2); Flint concretions (primary deposits) in the southern part of Nikopol, near Ali Koch Baba Teke (3)

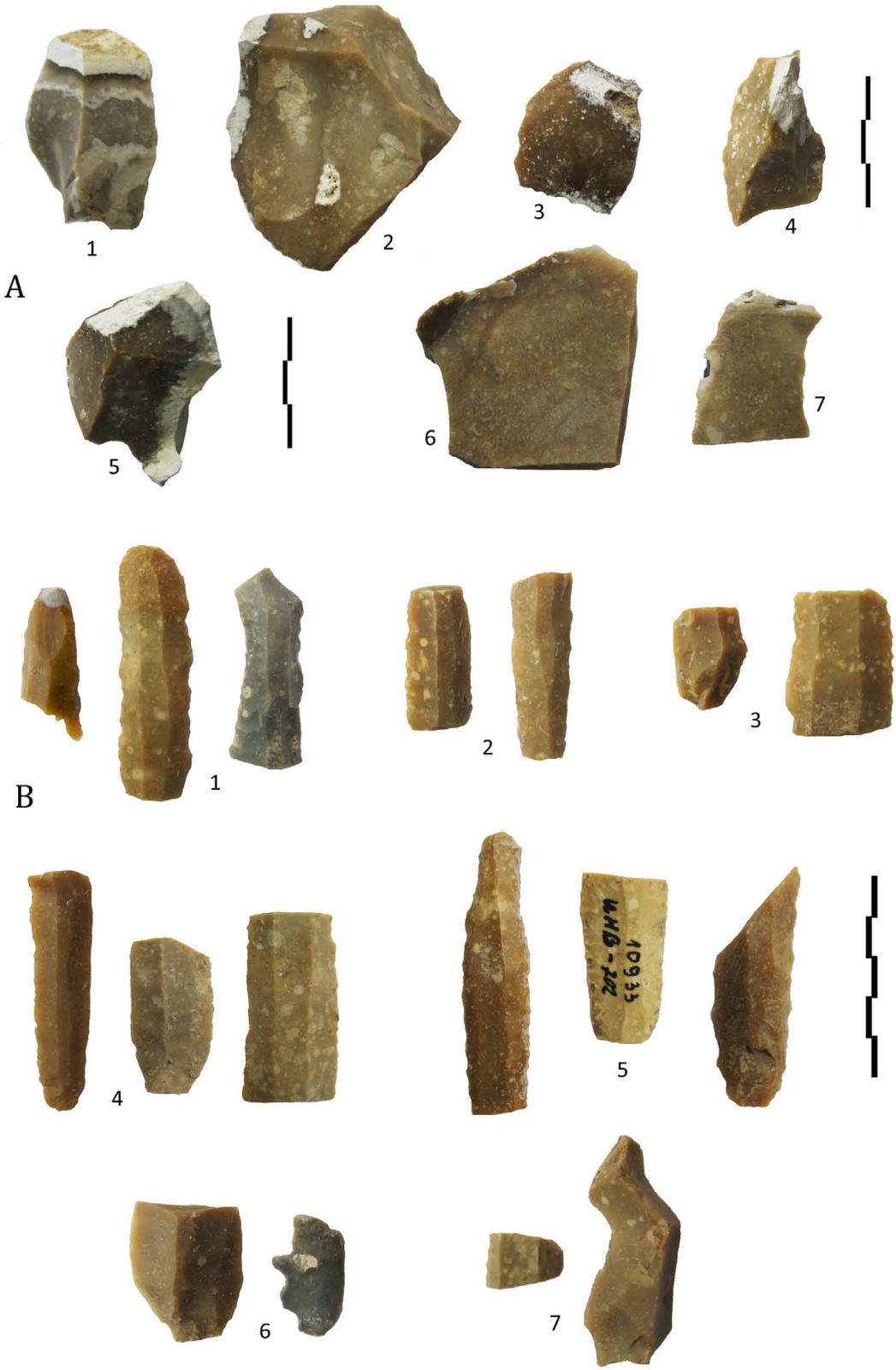


Fig. 7. Raw material samples (A) and archaeological artefacts from Early Neolithic sites in Bulgaria (B) subjected to a combined analytical procedure – micropetrography and geochemistry via LA-ICP-MS. A – 1. Debovo; 2. Zhernov, 3. Mouselievo; 4. Ali Koch Baba Teke; 5. Danube; 6. Gortalovo; 7. Bohot Lake; B – 1. Karanovo; 2. Yabalkovo; 3. Slatina; 4. Kovachevo; 5. Sedlare; 6. Dzhulyunitsa; 7. Ohoden (reproduced fig. 7 from Gurova et al. 2016)

regional Early Neolithic complex in the Balkans (i.e., Balkan flint), reminds us that B. Voytek presumed the Shumen region to be the likely provenance area of this type of flint. Another challenge is that the Early Neolithic site of Varbitsa (Shumen district) produced artefacts similar to Balkan flint formal tools. Geologically, several Upper Cretaceous limestone units contain flint concretions (including the Mezdra siliceous-carbonate Formation). Two new types of flint (Shumen I and II) were distinguished and described. Visually, Shumen I closely resembles Balkan flint, but geological and LA-ICP-MS analyses suggest that they have different petrographic and geochemical profiles (fig. 9).

- Our fourth campaign took place in northwest Bulgaria, which remained largely unexplored in our previous survey (Gurova et al. 2021a–b). Recently, newly discovered archaeological sites have yielded abundant chipped-stone assemblages in a variety of raw materials, including Balkan flint. On the other hand, the archaeological sites are located on Neogene rocks devoid of flints (fig. 10). There is limited use of the local raw materials; none of them resembled Balkan flint, but not surprisingly, a large proportion of the artefacts from the Early Neolithic settlements (particularly Yarlovitsa) originated from Balkan flint sources in the Pleven–Nikopol cluster.

- Our most recent campaign was carried out in 2023 in north-central Bulgaria (Lovech and Veliko Tarnovo districts), which was only partially surveyed in our previous fieldwork in 2011 (Gurova et al. 2024). A new series of 10 raw materials and 15 archaeological samples was collected and subjected to an analytical procedure combining macro- and micropetrography with LA-ICP-MS geochemical analysis. One of the purposes was to collect samples, facilitating our attempt to distinguish between raw materials from two partially overlapping Late Cretaceous formations – Mezdra and Rumyantsevo – containing macroscopically similar flint concretions (ergo similar to Balkan flint). Another goal was to reliably discriminate between the outcrops and the artefacts/assemblages affiliated to them and originating from later prehistory, especially the Chalcolithic and Bronze Age periods. The results showed that samples from the Rumyantsevo limestone formation are very similar to some previously studied Upper Cretaceous flint (Balkan flint) samples from the Mezdra siliceous-carbonate Formation. However, it could be noted that carbonate deposits of the Rumyantsevo limestone Formation have relatively small thickness (only 2–4 m) and restricted local occurrence in comparison to the Mezdra siliceous-carbonate Formation. For now, flint assemblages from the later prehistoric periods (Bronze Age, Early Iron Age) show affinity with the Rumyantsevo Formation.

Meantime, thanks to a grant-aided project of the Archaeological Institute in Sofia, we enlarged our sample corpus with several additional raw materials to be compared with the Balkan flint database and with 77 artefacts from 10 Early Neolithic sites {5 previously studied but now with more representative sampling (Slatina, Kovachevo, Dzhhulyunitsa, Varbitsa and Yabalkovo), three new sites in the Struma Valley (Ilindentsi, Brezhani and Drenkovo) as well as Tell Karanovo and the site of Yarlovitsa in northwestern Bulgaria)} (fig. 11). The analytical procedure involved comparing the new series of artefacts with the Balkan flint raw materials recovered from all survey seasons. Our last results are very informative and, in some respects, unforeseen. They demonstrate a relevant way and opportunity to relate and distinguish between artefacts and raw material outcrops as well as between artefacts themselves and sources themselves, which is a condition for reliable reconstruction of raw material distribution (Gurova et al. 2022b).

All geological samples acquired during the surveys were described macroscopically (colour, size, shape, texture, cortex, etc.). Thin sections were prepared and examined under a standard petrographic microscope. The aim was to describe their microscopic characteristics (mineral-

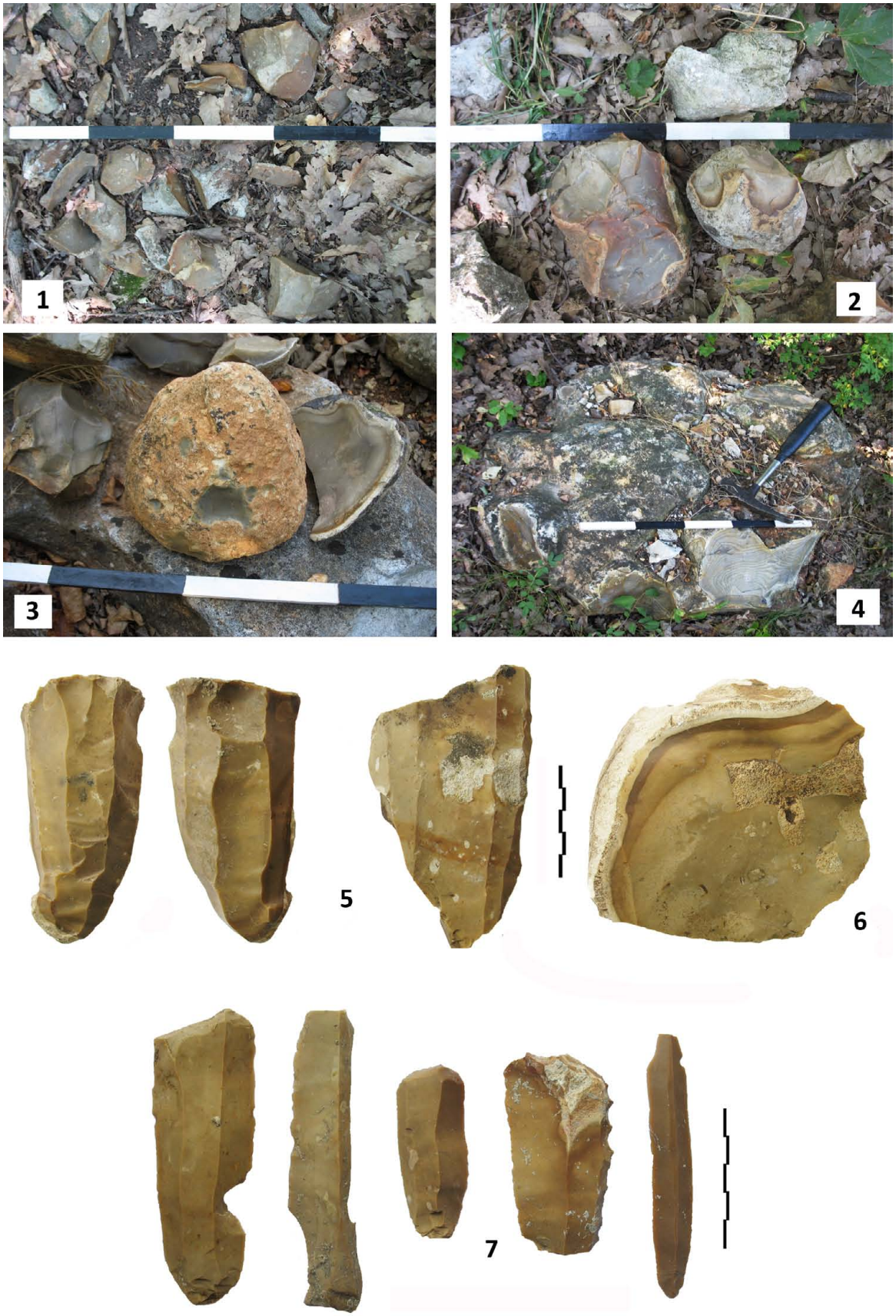


Fig. 8. Ludogorie flint secondary deposits: 1. Kriva reka; 2. Ravno; 3–4. Tetovo. Artefacts of Ravno flints from: 5. Kamenovo; 6. Ravno; 7. Chalcolithic Tell Kosharna (reproduced fig. 6 from Gurova et al. 2025)

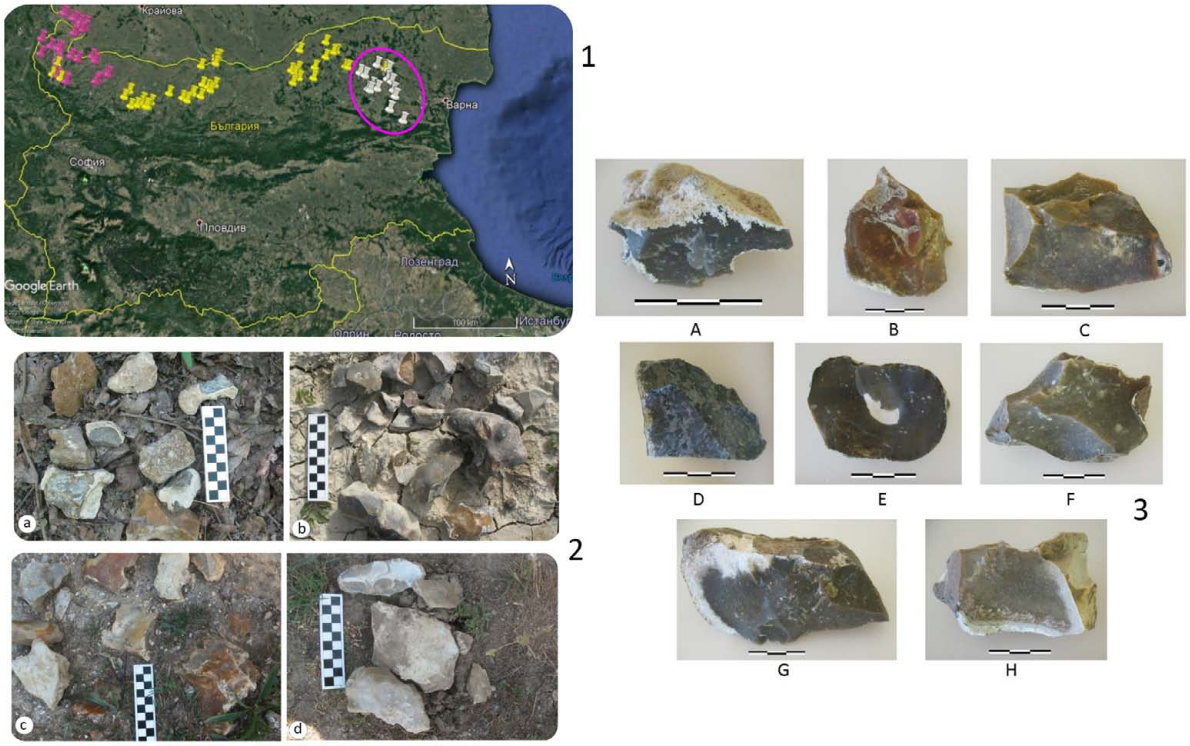


Fig. 9. Shumen cluster of raw materials outcrops marked by a purple ellipse (1). Secondary deposits of flints type Shumen I from the town of Shumen (c, d) and flint type Shumen II from Mogila village (a) and Markovo village (b); 3. Raw material samples subjected to analytical procedure (adapted from figs 6, 8–9 in Gurova et al. 2022a)

ogy, rock texture, limestone relics and fossil assemblages, and relative proportions of siliceous and carbonate components, etc.) to distinguish petrographically the various flint types (fig. 12). Trace element analysis was performed using laser ablation inductively coupled plasma mass spectrometry (LA-ICP-MS), which is particularly suitable for the analysis of archaeological materials, being minimally destructive and requiring little sample preparation. We recorded concentrations of 45 elements. Of these, Al, K, Na, B, Mg, Ca and Fe were found to be the most useful for discriminating between different types of flint. The concentrations of these elements in many of the raw materials analyzed from north-central Bulgaria (our first campaign) overlap with those of most artefacts made of visually distinctive Balkan flint (fig. 13). This integrated laboratory investigation of raw materials and archaeological artefacts was applied to all samples presented in Table 1.

The results of the petrographic and geochemical analyses are presented in detail in the 2022 publication (Gurova et al. 2022b) and summarized in our most recent publication (Gurova et al. 2025). However, their selective synopsis/recalling here is noteworthy because they concern some crucial aspects of Balkan flint from which serious questions and conclusions are derived.

1. The combined petrographic and geochemical analytical results of the artefacts identified two groups of flint: the First group is represented by Balkan flint, with its typical visual appearance – yellowish-brown (occasionally beige or light-grey) groundmass with variable white spots – correlated with outcrops of the Pleven–Nikopol cluster and represented in all Early Neolithic assemblages studied (fig. 14). There is an additional subgroup, identified by

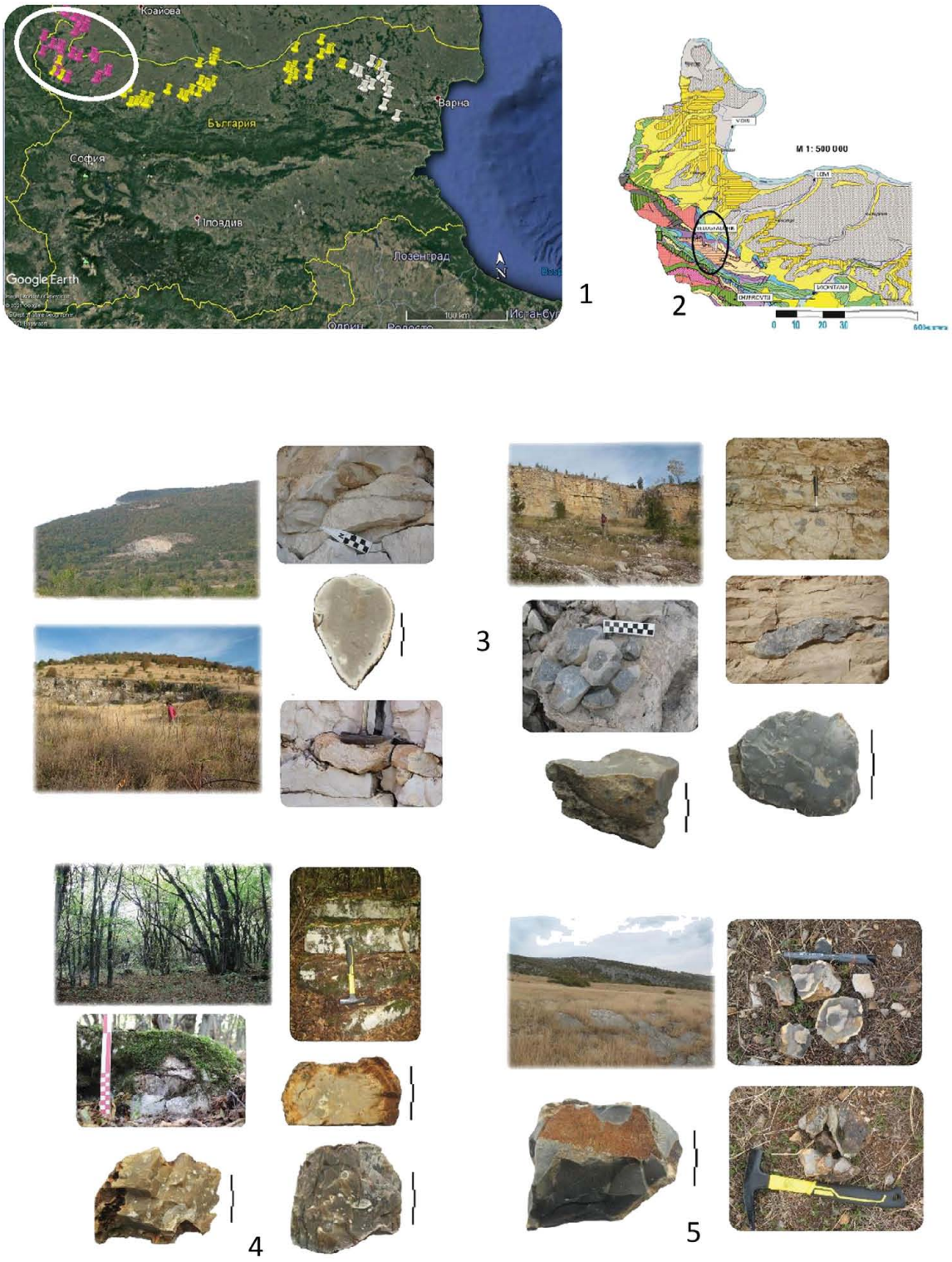


Fig. 10. Flint outcrops in northwest Bulgaria: Map with points of interest as raw material outcrops and archaeological sites during the 2020 survey marked by the white ellipse (1); Geological map and the parcel of West Balkan Carbonate Group (blue coloured layers in the black ellipse (2); Oreshets quarries (3); Raw material outcrops near Granitovo (4); Raw material outcrops near Replyana (5) (collage of figs 4.1; 7–10 from Gurova et al. 2021b)

elevated concentrations of Ca and Mg, which is observed only in artefacts from Dzhulyunitsa and Karanovo; the Second Group consists of dark-grey (to black) white-spotted flint – its petrography and geochemistry show a degree of correlation with newly analyzed raw materials from near Tarnovo and with previously studied raw materials of the Shumen II type, but it is not identical. Some grey-spotted flint artefacts are petrographically similar to flint group II, but their trace element composition resembles that of the Balkan flint raw materials. Currently, the provenance of group II (dark-grey flint) is unknown but may be resolved by further surveys, sampling and analyses;

2. The concentration values of some elements (Na, Al and K) allow distinction of two groups of raw materials (fig. 15) with clear distinction of Shumen I and II types and a smaller portion of Balkan flint falling into group B (among them Mouselievo and Ali Koch Baba Teke (see no. 4 below);

3. The macroscopic similarity of some artefacts from Varbitsa and the raw materials of the Shumen I type to Balkan flint is not reflected in their micropetrography and geochemistry. It follows that a strong visual resemblance alone could be misleading for our attempts to reconstruct the provenance and distribution of Balkan flint-like raw material. This conclusion applies to most of the raw material studies and interpretations of prehistoric assemblages from Bulgaria (cf. my comments on Case study no. 5 – Yabalkovo). Our research has shown that visual interpretation of raw material can be unreliable and should be avoided, as it risks becoming pure speculation;

4. Surprisingly, the flints from some of the main Balkan flint outcrops identified (Ali Koch Baba Teke, Mouselievo 3 and Bohot Lake 1) are not represented among the artefacts analyzed, which is intriguing in light of the discovery of alleged Balkan flint workshops near Nikopol. The existence of Balkan flint outcrops at Ali Koch Baba is incontestable, but their extensive use by Early Neolithic people has yet to be demonstrated. Here, I do expect that the far-fetched interpretations of 'workshop(S)' for Balkan flint at Ali Koch Baba Teke as claimed by Biagi and Starnini (Biagi, Starnini 2010a-b; 2011) and some of their unconditional adherents (Gatsov et al. 2017; Gatsov, Nedelcheva 2019) should hopefully end;

5. GIS modelling helps identify possible pathways for flint distribution between sources and sites of consumption, showing that the distances between them range from 23 to 314 km – assuming direct distribution from the outcrops to the sites. Extrapolation of arbitrary boundaries of raw material distribution (local distribution – over distances of 0 to 20 km; meso-local – 20 to 50 km; regional/extra-local – 50 to 100 km; and supra-regional/long-distance – over 100 km) suggests a procurement strategy based on very few meso-local and regional exchanges, and predominantly on long-distance raw material distribution (Table 2 – taken from Gurova et al. 2022b, 22, Table 2).

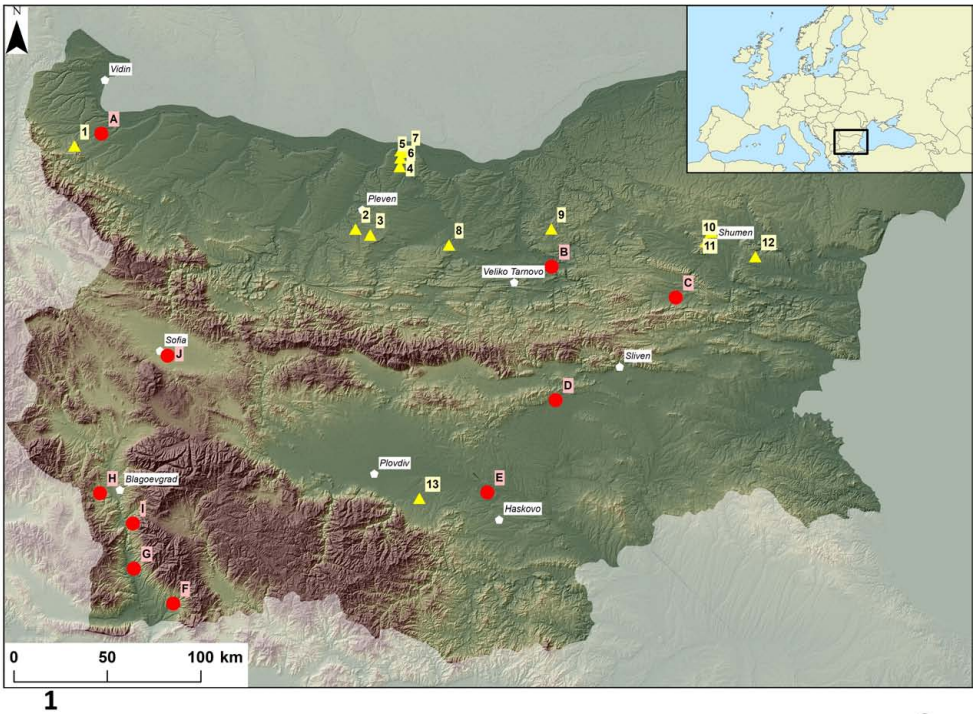
Table 2

Raw material outcrop	Archaeological site	Distance (in km)	Map colour line- *fig.16*
Nikopol cluster (4, 5, 6, 7)	Yarlovitsa (A)	168	Red
	Dzhulyunitsa (B)	102	
	Varbitsa (C)	176	
	Karanovo (D)	165	
	Yabalkovo (E)	199	
	Kovachevo (F)	314	
	Ilindentsi (G)	308	
	Drenkovo (H)	272	
	Brezhani (I)	283	
	Slatina (J)	180	
Gortalovo (2) (Pleven cluster)	Dzhulyunitsa (B)	113	Light green
	Karanovo (D)	153	
Varbovka (8)	Dzhulyunitsa (B)	60	Blue dotted
Shumen I (10)	Varbitsa (C)	39	Green dotted
Shumen II (Markovo) (12)	Dzhulyunitsa (B)	117	Black
	Varbitsa (C)	51	
	Karanovo (D)	149	
Lozen (9)	Dzhulyunitsa (B)	23	Yellow dotted
	Varbitsa (C)	83	
	Karanovo (D)	105	

Table 2. Estimated distances between outcrops and archaeological sites-consumers of raw materials (reproduced Table 2 from Gurova et al. 2022b)

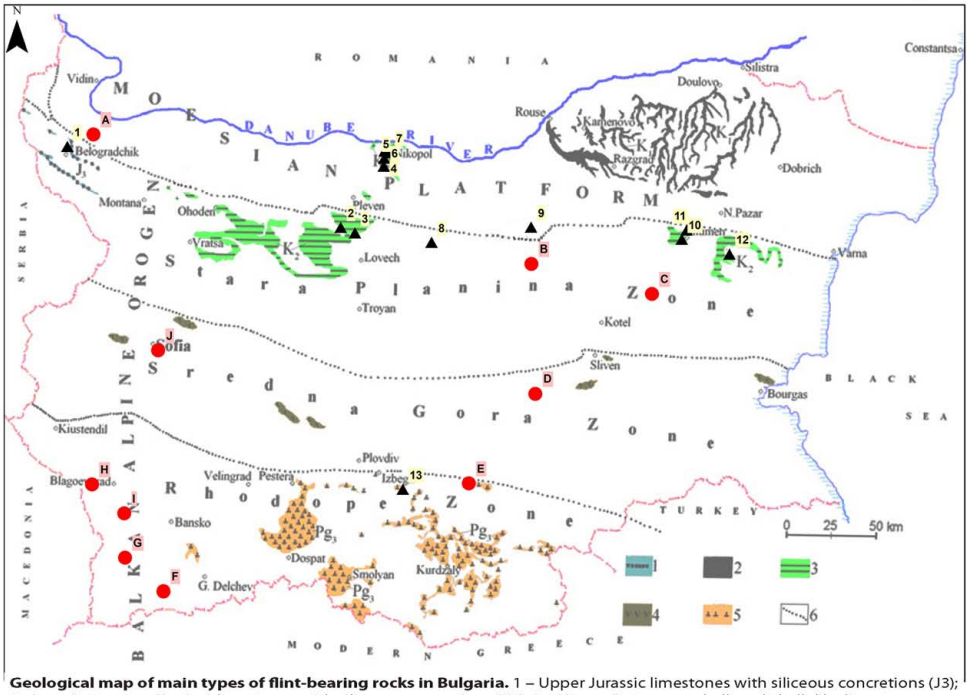
As for the mediating points and inter-site connections, in my personal opinion, as a working hypothesis, the site of Dzhulyunitsa could have mediated the distribution of Pleven–Nikopol Balkan flint to the sites on the Upper Thrace (Karanovo and Yabalkovo); the site of Slatina might have been involved in the southward distribution of Balkan flint to sites in the Middle Struma Valley (Kovachevo, Ilindentsi, Drenkovo and Brezhani). The site of Varbitsa seems suitable as a redistribution point for Shumen I and II flints to the Thracian sites in the Early Neolithic. On the other hand, Dzhulyunitsa and Varbitsa are well situated for the mutual exchange of Balkan flint and Shumen I–II during those periods when their occupations overlapped. The people who travelled between the Balkan flint outcrops and the sites of consumption, whether they were groups from the redistribution/secondary centres of Balkan flint or specialized groups of travelling traders/itinerant knappers, practising down-the-line exchange, remain “beyond the boundaries of empirically-based hypothesis”. Rigorous scientific analyses suggest that one or more sources were used to meet the demands of site consumers (fig. 16).

The Balkan flint issues mentioned above, extrapolated to the Neolithization discourse – arguments and causality, suggest that none of the conventional scenarios and paradigms of the Neolithization of Bulgaria is workable without taking into consideration the Balkan flint outcrops and their accessibility to the first Neolithic settlers. The repetition of the Balkan flint for-



1

2



Geological map of main types of flint-bearing rocks in Bulgaria. 1 – Upper Jurassic limestones with siliceous concretions (J3); 2 - Low Cretaceous (Aptian) limestones with siliceous concretions (K1); 3 – Upper Cretaceous chalk and chalk-like limestones with siliceous concretions (K2); 4 – Upper Cretaceous volcanogenous rocks with chalcedony veins in Sredna Gora Zone; 5 - Oligocene volcanogenous rocks with chalcedony veins in Rhodope Zone (Pg3); 6 – Boundary between tectonic zones.

Fig. 11. 1. Map of Bulgaria with the archaeological sites (red circles) and raw material outcrops (yellow triangles). Sites: A. Yarlovitsa; B. Dzhulyunitsa; C. Varbitsa; D. Karanovo; E. Yabalkovo; F. Kovachevo; G. Ilindentsi; H. Drenkovo; I. Brezhani; J. Slatina; RM outcrops: 1. Granitovo; 2. Gortalovo; 3. Bohot Lake; 4. Mouselievo; 5. Zhernov; 6. Danube; 7. Ali Koch Baba Teke; 8. Varbovka; 9. Lozen; 10. Shumen; 11. Panayot Volov; 12. Markovo; 13. Izbegli (figure by N. Kecheva); 2. Adapted geological map with the archaeological sites (red circles) and raw material outcrops (black triangles), described in the legend of map 1. Geological map (background – according to Nachev 2009, fig. 1; additions by N. Kecheva) (maps reproduced from Gurova et al. 2022b, figs 1–2)

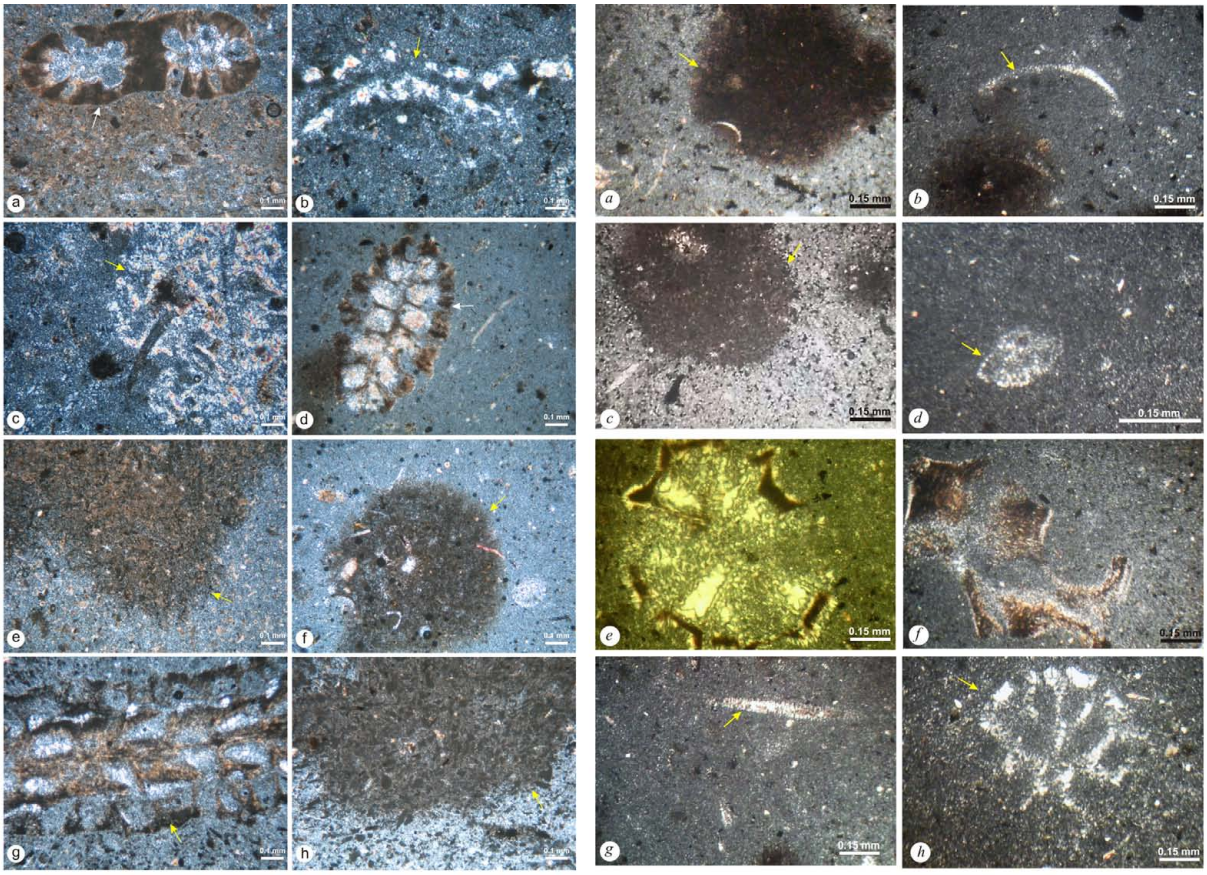


Fig. 12. Thin sections of samples with all photomicrographs in cross-polarized light: 1. Balkan flint from Bulgarian outcrops and archaeological sites: a) raw material, Gortalovo village; b) artefact from Ali Koch Baba Teke; c) artefacts from Sedlare; d) artefacts from Ohoden; e: raw material from Pelishat; f) artefacts from Yabalkovo; g–h) raw material from Bohot lake; 2. Flint group I (Balkan flint) from the Early Neolithic sites: a) Slatina, S21; b) Yabalkovo, S43; c) Yarlovitsa, S31; d) Dzhulyunitsa, S64; e) Kovachevo, S14; f) Slatina, S28; g) Karanovo, S71; h) Karanovo, S76. (collage of fig. 9 in Gurova et al. 2016 and fig. 8 in Gurova et al. 2022b, figures by P. Andreeva)

mal toolkits over a large territory and their co-occurrence with other distinctive socio-cultural traits in the first half of the 6th millennium cal BC implies the existence of a sophisticated exchange network with a high degree of interaction, elements of which are still invisible, but which requires detailed systematic research. Let us see what can be stated in the current stage of knowledge…

The first hypothetical issue concerns the lack of the pre-Karanovo distribution of Balkan flint from north Bulgarian outcrops to the sites of Karanovo I milieu in south Bulgaria. On the other hand, it is possible to envisage some Balkan flint exchange between pre-Karanovo communities around the Dzhulyunitsa site with the eventual pre-Karanovo substratum in Thrace, for which no archaeological evidence is expected.

2.3.3. BALKAN FLINT NETWORK DISTRIBUTION: A MAJOR EXCHANGE SYSTEM

Balkan flint formal tools (mainly retouched blades often with variably fashioned ends and sickle elements) appear in representative series among Early Neolithic assemblages with white-on-red painted decoration, which is the hallmark of the Karanovo I culture in Thrace together with its

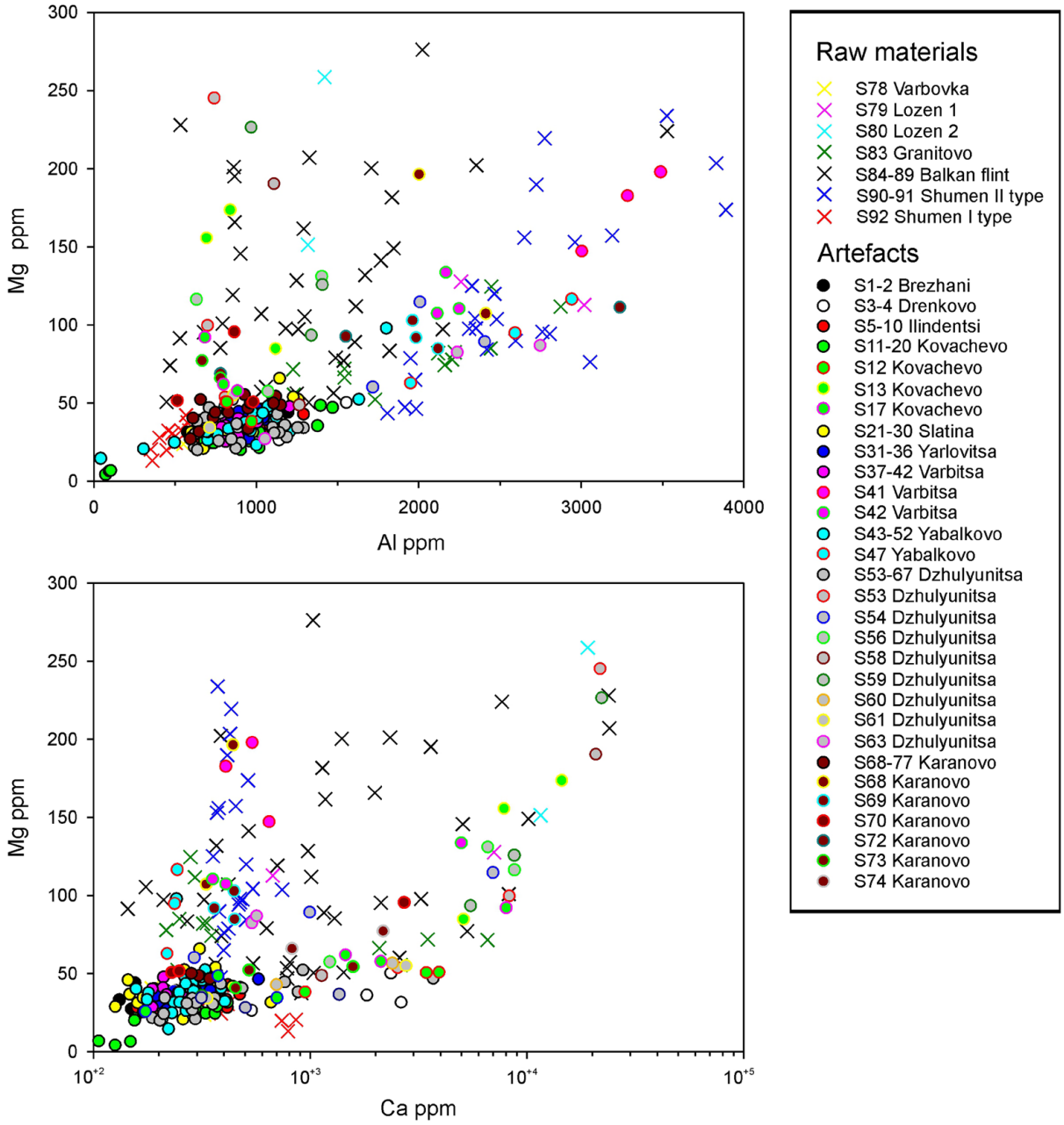


Fig. 13. Trace element content (Al, Mg and Ca) in all analysed artefacts from this study, compared to different flint raw materials (reproduced fig. 13 from Gurova et al. 2022b, figure by E. Stefanova)

south/southwestern variant (including the Sofia plain) and sites in the upper and middle Struma Valley (fig. 17). In this sense, the formal tools made of Balkan flint are and should be treated as cultural marker of the Karanovo I complex as well. They continue to be abundant during the Karanovo II culture and persist in the chrono-cultural Neolithic sequence during Karanovo III and IV as a retardation/reminiscent form. In the latter part of the sequence, they lose their diagnostic character but, given their quality, continue to be reshaped and reused in both utilitarian and possibly symbolic aspects. It should be emphasized that formal toolkits *sensu stricto* are attributable to the Karanovo I–II cultural alliance. Still, Balkan flint as raw material and debitage products have a much broader distribution. They are abundant among the assemblages from north Bulgaria, which is logical and expected due to the location of the outcrops in the Pleven–

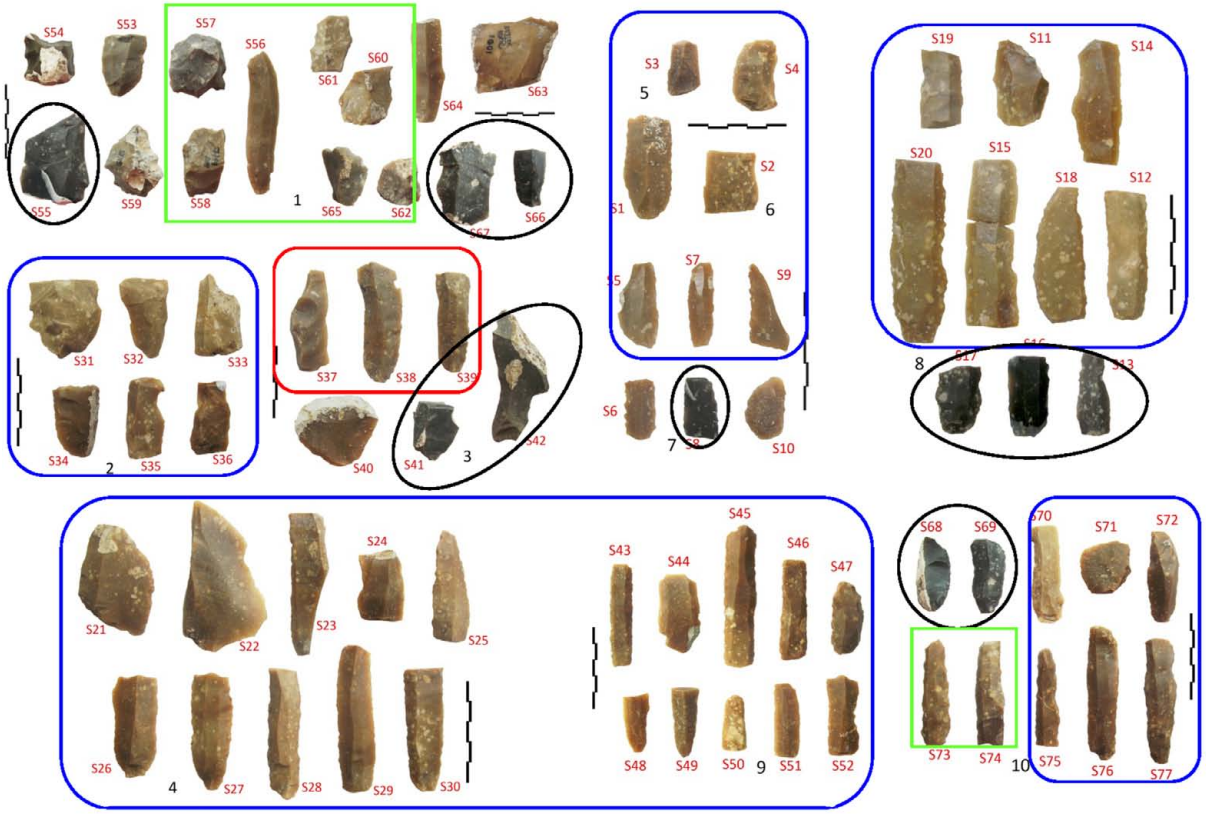


Fig. 14. Archaeological samples analysed and discussed from the following Early Neolithic sites: 1. Dzhulyunitsa; 2. Yarlovitsa; 3. Varbitsa; 4. Slatina; 5. Drenkovo; 6. Brezhani; 7. Ilindentsi; 8. Kovachevo; 9. Yabalkovo; 10. Karanovo. Coloured marks show grouping of the artefacts according to analytical results

Nikopol area and in a small cluster around Shumen, where the Shumen I type of flint originated, which, as mentioned above, is (only!) the macroscopic equivalent of typical Balkan flint.

Early Neolithic sites with Balkan flint artefacts among their chipped-stone assemblages are widely distributed in Southeastern Europe (fig. 18). They occur throughout Bulgaria, as debitage and in smaller quantities as formal tools in Serbia including Vojvodina (Kozłowski 1982; Kozłowski, Kozłowski 1984; Šarić 2003, 2004; Borić 2007; 2008; Bogosavljević-Petrović, Marković 2012; Bogosavljević-Petrović, Starović 2013; Horejs et al. 2022; Brandl et al. 2025; Jovanović 2022), North Macedonia (Димитровска 2013; Biagi, Starnini 2010b; Dimitrovska 2012); southern Romania (Dinan, Nica 1995; Bonsall 2008; Crandell 2008, 2013), and the Carpathian basin (southeast Hungary) (Biagi, Starnini 2010b; 2013).

Of particular interest is the presence of formal tools of Balkan flint among some Early Neolithic assemblages in Turkish Thrace. At Hoca Çeşme, Balkan flint formal tools occur in phase II (Özdoğan 2008, 154; Gatsov 2009, 77–78), and at Aşağı Pınar in layers 6 and 7 (Özdoğan 2011a, fig. 6) (fig. 18.2).

However, the most surprising find of Balkan flint is the formal toolkit repertoire from the site of Uğurlu on the island of Gökçeada (Imbros) (Guilbeau, Erdoğu, 2011; Erdoğu, 2014; 2017; Özbek, Erdoğu 2014). Among the approximately 1000 lithics from phase IV, 11 are Balkan flint formal tools (‘Karanovo blades’) (fig.18.1). Most likely, the formal tools at these sites were imported as finished products of special value.

Recently discovered Early Neolithic sites in the Republic of North Macedonia have produced an impressive series of AMS dates (notably from Vlaho, cf. Naumov, Reingruber 2024),

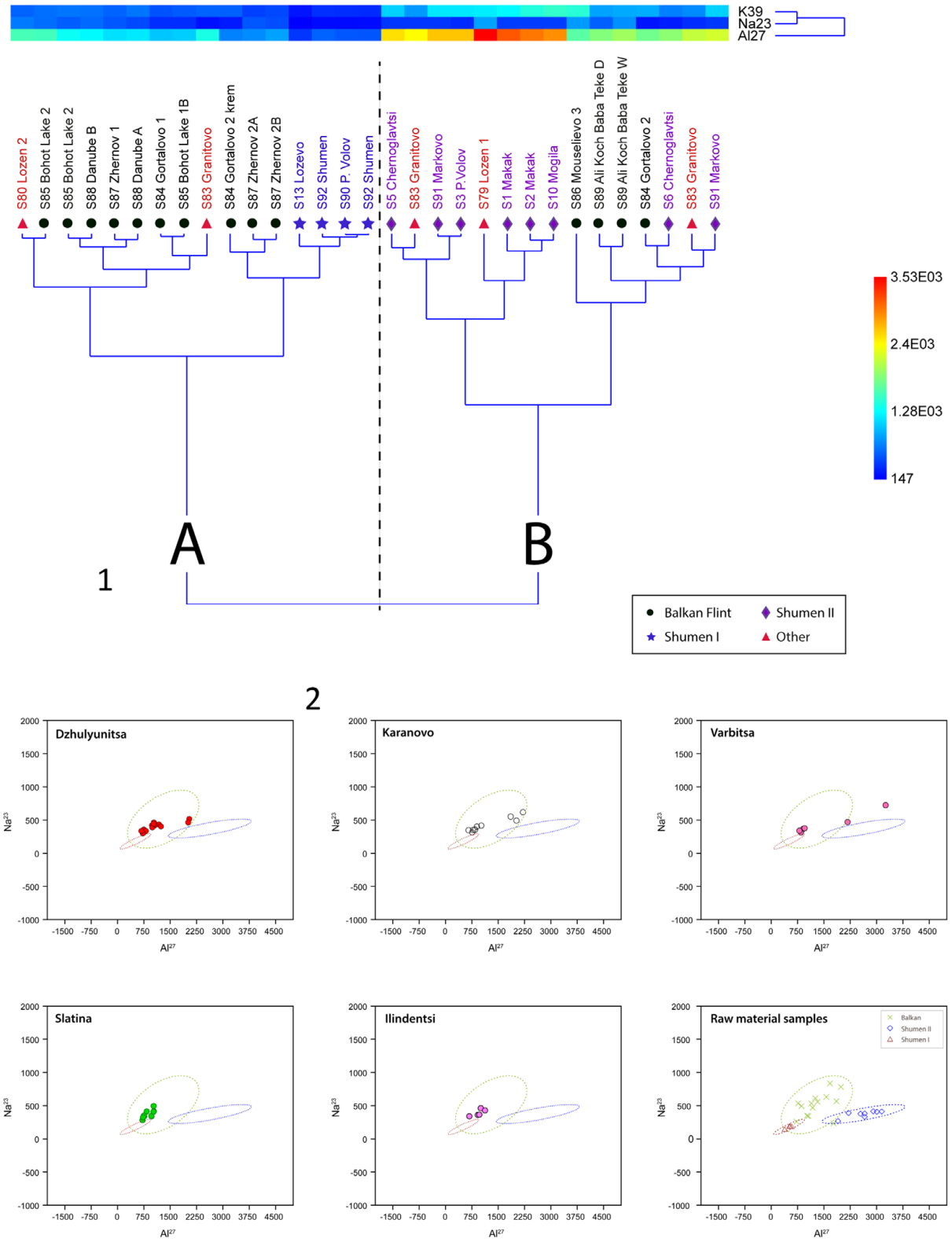


Fig. 15. Clustering of raw material samples (1); Scatter plots of Na/Al for Balkan flint from selected early Neolithic sites displayed against the variation of BF raw material and Shumen types in comparison (collage of figs 10 and 12 from Gurova et al. 2025, figures by C. Bonsall)

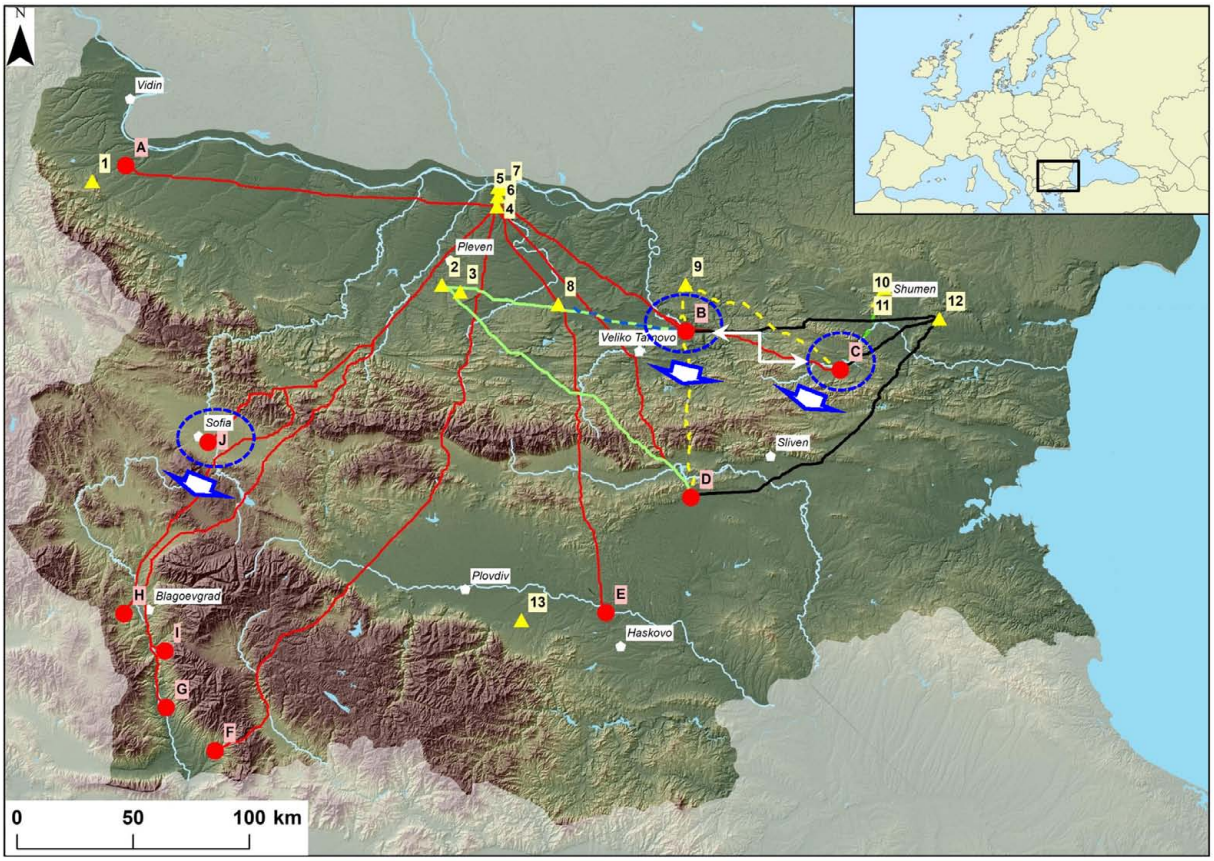


Fig. 16. Map of possible paths between raw material outcrops (yellow triangles) and archaeological sites (red circles): from the Nikopol cluster (4, 5, 6 and 7) to all ten archaeological sites (red line), from Gortalovo (2) to Dzhulyunitsa (B) and Karanovo (D) (light green line), from Varbovka (8) to Dzhulyunitsa (B) (blue dashed line), from Shumen I (10) to Varbitsa (C) (green dashed line), from Shumen II (Markovo) (12) to Dzhulyunitsa (B), Varbitsa (C) and Karanovo (D) (black line), from Lozen (9) to Dzhulyunitsa (B), Varbitsa (C) and Karanovo (D) (yellow dashed line). Blue circles with blue arrows – possible redistribution of RM from site to site; White double arrow – possible inter-site reciprocal RM distribution (reproduced fig. 11 from Gurova et al. 2025 – original map by N. Kecheva with additions by M. Gurova)

suggesting the establishment of Neolithic farming settlements several centuries before 6000 BC. However, there are no suitable published illustrations of the flint artefacts. On the other hand, the data from Govrlevo and Vrbjanska Čuka reveal examples of individual but typical Balkan flint formal tools used as sickle inserts (Mazzucco et al. 2022, 21, fig. 3).

Balkan flint has come to be regarded as a key marker of the spread of the Neolithic across Southeastern Europe, with some authors (e.g., Biagi, Starnini 2013) suggesting that the archaeological distribution reflects the main Neolithization routes. The reality is more complex, as indicated by the dating evidence. To the south of the Balkan Mountain range – in southern Bulgaria, Turkish Thrace and on the island of Gökçeada in the northeast Aegean, the appearance of Balkan flint in Neolithic contexts seems to have been somewhat later than in the Danube catchment, after 6000 cal BC (Table 3). There are no more recent dates that would necessitate revision of the chronology of Balkan flint emergence and spread over a large territory, and its co-occurrence with other distinctive socio-cultural traits in the first half of the 6th millennium cal BC. This implies the existence of a sophisticated exchange network with a high degree of interaction.



Fig. 17. Formal tools of Balkan flint from: 1. Karanovo II; 2. Yabalkovo; 3. Kovachevo; sickle inserts from: 4. Kovachevo; 5. Yabalkovo; visual appearance of Balkan flint formal toolkits from: 6. Yabalkovo; 7. Rakitovo.

Table 3

Site	Phase	Approximate age range (cal BC)
Karanovo (BG)	I.1	5850–5675
Azmak (BG)	I–1	5900–5700
Slatina (BG)		5780–5680
Kovachevo (BG)	Ic–d	<5900
Hoca Çeşme (TR)	II	5890–5700
Aşağı Pınar (TR)	layers 6–7	5750–5600
Uğurlu (Gökçeada, TR)	IV	ca 5880

Table 3. Earliest occurrence of Balkan flint artefacts in Neolithic sites south of the Balkan mountain range. The age ranges shown are based on Bayesian modelling of available ^{14}C dates, allowing for a possible 'old wood effect' in bulk charcoal dates (e.g. Bln-4339, Bln-4336 from Karanovo I.1; Bln-293, Bln-291 from Azmak I-1). Data from: Görsdorf, Boyadžiev 1996; Evin 2002; Görsdorf 2005; Reingruber, Thissen 2005; Higham et al. 2011; Erdoğu 2011) (reproduced Table 1 from Gurova, Bonsall 2014a)

The Balkan flint distribution system was one of two major lithic exchange networks operating in Southeast Europe (together with the Melian obsidian distribution) during the Early Neolithic, which were symptomatic of interaction spheres that probably played a crucial role in the Neolithization of their respective regions. It is noteworthy here that because of the very scarce quantity of obsidian artefacts in Bulgaria and their demonstrable Carpathian origin (Bonsall et al. 2017), the competing (with obsidian) raw material from our lands could be and have undoubtedly been the Balkan flint (fig. 19). To the south of the Balkan flint province, obsidian from outcrops on the island of Melos was traded throughout the Aegean and neighbouring coastal areas of mainland Greece and western Anatolia. Perlès (1990, 2004, Perlès et al. 2011) and Reingruber (2011) have highlighted some of the key features of the Melian obsidian network: (i) the system was already in place well before the Neolithic, although it seems to undergo significant expansion during the Early Neolithic; (ii) obsidian from Melos was transported over distances of up to 300 km, and necessarily involved water transport; and (iii) the obsidian trade probably involved specialist knappers who acquired the material from its sources on Melos and distributed it mainly in the form of blades and bladelets. Beyond the rational questions and possibilities within this obsidian network, a deeper understanding of mobility could be implemented in this exchange/trade with an inevitable trajectory to the complex transformation which took place during the interactions between Mesolithic fisher-traders and the Neolithic farmers (movements and transformations here seen in the sense of Reingruber's understanding (Reingruber 2018).

Did the Balkan flint network share these same characteristics? Material was certainly moved over considerable distances, comparable to (or even greater than) those of the Melian obsidian network; the straight-line distance from Nikopol to the Aegean Island of Gökçeada, for example, is *ca* 400 km. More intriguing and important were itinerant flint knappers involved in the production and distribution of Balkan flint artefacts, or was the movement of raw material and artefacts part and parcel of normal social relationships between households and communities? These questions, however, remain unresolved.

Water transport likely played a lesser role in the Balkan flint network; nevertheless, larger



Fig. 18. Balkan flint at the inter-regional scale: 1. Formal tools from the Early Neolithic site of Uğurlu (Gökçeada) (after Erdoğu 2014, fig. 14); 2. Formal tools from Aşağı Pınar (eastern Thrace)(after Özdoğan 2011b, fig. 6); 3. Balkan flint raw material from Murfatlar and Ovidiu, Romania (after Crandell 2013, fig. 5); 4. Formal tools from Zuniver and Tumba Madzhari (after Димитровска 2013, fig. 22); 5. Balkan flint artefacts from Grivac, Tečić and Vršac–At (Starčevo culture, below) and Belovode (Vinča culture, above) (after Bogosavljević-Petrović, Marković 2012, fig. 6)(reproduced fig. 6 from Gurova, Bonsall 2014a, with authors' permission)

rivers (especially within the Danube catchment) and the Black Sea coast may have been important distribution routes (Начев 2009; Gurova, Bonsall 2014b). Equally important for our understanding of Neolithization, did the first farmers in the Lower Danube catchment discover the north Bulgarian outcrops for themselves, or was there an existing Balkan flint exchange network operating among Late Mesolithic fishing communities along the Bulgarian section of the Lower Danube and the Black Sea coast (Gurova, Bonsall 2014b)? As the authors have observed, the answer to this and other questions regarding the Mesolithic-Neolithic transition in Southeast Europe must await systematic archaeological surveys of the Lower Danube Valley and the submerged Black Sea coastal plain.

One crucial question is which Bulgarian sites were involved in the network and what role they played in intra- and inter-community exchange? This question inevitably raises the next – about the Balkan flint procurement and artefact production workshops. On the Balkan flint outcrops identified, the most promising workshops are:

- Zhernov, south of Nikopol on the River Osam (Gurova, Bonsall 2014a, fig.12) (fig. 20),



Fig. 19. Source area and directions of the Balkan flint distribution (reproduced fig. 16.B from Gurova, Bonsall 2014a)

where abundant flint nodules occur in a secondary position together with artefacts. Evidently, the site functioned as a large workshop, with uncertain dating, but undoubtedly related to the extraction and processing of secondary flint deposits (derived from the Mezdra siliceous-carbonate Formation) at some stage of the Holocene;

- Mouselievo, primary flint deposits are located south of the eponymous village and belong to the Upper Cretaceous Mezdra Formation (Gurova et al. 2016, fig. 3b). Macroscopically, the raw material from Mouselievo corresponds to the Balkan flint type of material. Significantly, at the foot of the hill, a Middle Palaeolithic site and workshop for bifacial leaf points were excavated in the 1970s and 1980s (Sirakova 1990; 2020). Bronze Age workshop Osama (nearby) was also identified and published (Сиракова 2006), but as mentioned above, none of the Early Neolithic artefacts analyzed corresponds analytically to the flint samples from Mouselievo;

- Ali Koch Baba Teke, in the south of Nikopol, has primary deposits of Balkan flint nodules. These occur in chalky limestone, also belonging to the Upper Cretaceous Mezdra For-

mation (Gurova, Bonsall 2014a, fig. 13) (fig. 6.3). Artefacts were also found adjacent to the outcrop; they lack diagnostic cultural characteristics, although the site was published by Biagi and Starnini as a source and workshop(s) of Balkan flint with evidence of Neolithic exploitation (Biagi, Starnini 2010a, 2010b, 2011; see also Gurova 2012a, 37–8)[6]. There are good arguments for excluding the site from the label Neolithic workshop(s) for the reasons mentioned above.

Regarding workshops at some Early Neolithic sites, the only site with a production zone/atelier is Slatina, but only three cores were recorded. Unfortunately, most of the artefacts were heavily affected by heat during the burning of the "big house". The flint assemblages were published in Nikolov's book as short reports written by I. Gatsov (techno-typological description) and N. Skakun (functional analyses of the artefacts) (Гацов 1992b, 99–101; Скакун 1992, 101-107). Gatsov mentions about 285 artefacts suitable for analysis, selected from 3000 "burnt" pieces coming from the workshop area of the burnt "big house". Among the sample studied, there were three cores (maximum length 5.8 cm), one retouched tool, and the rest comprising blades and flakes in an uncertain ratio. Thus, not even the fragmented *chaîne opératoire* of the Balkan flint could be reconstructed based on the heat-altered assemblage.

In such a relatively simple situation, with two Neolithic sites, whose establishment occurred at the very end of the 7th millennium cal BC – Dzhulyunitsa in north-central Bulgaria and Kovachevo in the Middle Struma valley in the southwestern corner of the country, indisputable priority in the process of first adoption and (eventually) developing Balkan flint supply and distribution is more than obviously Dzhulyunitsa with its pre-Karanovo substratum and material culture patterns. Kovachevo, which is (one of) the first 'colonies' of the earliest farmers-migrants from Anatolia (directly or via north Aegean waves of Neolithic dispersal), does not reveal any Balkan flint presence before phases Ic & Id when the site was integrated into the Karanovo I cultural *koiné*. I have already expressed my hypothesis about Dzhulyunitsa's key role in Balkan flint networking with full consciousness of the anticipatory character of my suggestions. The earliest securely dated occurrence of Balkan flint in an Early Neolithic context is at Dzhulyunitsa in northern Bulgaria, where artefacts of Balkan flint occur from the beginning of the occupation sequence before 6000 cal BC.

I accept the fact of the prior date of Dzhulyunitsa's establishment, together with several sites in the cluster of 'monochrome' pottery settlement in the lower Danube course in north-northeast Bulgaria, such as Koprivets, Polyanitsa, Orlovets (see Krauss 2023, fig. 199; Krauss et al. 2017, fig. 4). I cannot approve or reject the probability of either theory of SMA Neolithic spread (in the sense of Krauss et al., ibid.) or the idea of Özdoğan (with its controversial evolution) of northward movement from northwestern Anatolia following the coastal plain and occupying Ludogorie with gradual inland invasion. Thus, Koprivets was settled by the monochrome pottery bearers (Özdoğan 2011a, 26). It should be stressed that both scenarios presume the unavoidable impact of the cooler "8.2 ka event" in the Neolithic spread. I am simply arguing that the Dzhulyunitsa site is more or less equidistant from both the Nikopol and Shumen outcrops (between 60 and 90 km – see fig. 11) and this type of site seems to be (one of) the key sites for Balkan flint blank (mainly blade) manufacture and distribution among the settlements in Bulgaria during a pre-Karanovo I phase of the Neolithic. The hypothesis is based on the assumption that the settlement of Dzhulyunitsa (and other, as yet undiscovered, sites in the vicinity of the

6 More thoughts about the "study trip" of Biagi & Starnini in Bulgaria (in fact illegal geo-archaeological survey, followed by taking the artefacts and repeatedly publishing them with over-fetched interpretation see in Gurova 2012a, 37–38.



Fig. 20. Raw material outcrops and workshop of Zhernov (on the route Pleven and Nikopol): 1. General view of the artificial profile and the Balkan flint concretions (secondary deposits in situ). 2. Artefacts from the workshop

Balkan flint outcrops) was not based on a typical subsistence agricultural economy (reflected in the scarce sickle inserts), but rather craft specializations such as flint knapping. The fact that there is no substantial quantity of cores to indicate active exploitation, and thus the *chaîne opératoire* is incomplete, does not suggest the absence of on-site knapping. As stated by Perlès & Papagiannaki, "Even when in situ production is attested, the *chaînes opératoires* are very incomplete: the flakes corresponding to the cores, or, conversely, the cores corresponding to the flakes are missing from our samples. Inevitably, this raises the question of the representativity of our samples" (Perlès, Papagiannaki 2022, 270).

Once the settlers from Dzhulyunitsa recognized the advantages of these flints for domestic/household needs, they could capitalize on this acquisition by incorporating their products into the network of intra- and inter-regional exchange of goods, exotica, and social messages (cf. Gurova 2012a–b, Gurova, Bonsall 2014a, Gurova et al. 2025). An additional argument could be the analytical results from the Balkan flint artefacts of Dzhulyunitsa and Karanovo, which show that only the assemblages from these two sites (in the current state of research) affiliate to a subgroup of Balkan flint, based on the elevated concentrations of Ca and Mg (*vide supra*).

To conclude: the section above is based on long-term interdisciplinary research on Balkan flint (with outcrops in north-central Bulgaria), emphasizing its emergence and repetition over a large territory, and its co-occurrence with other distinctive socio-cultural traits in the first half of the 6th millennium cal BC. This implies the existence of a sophisticated exchange network with a high degree of interaction, suggesting that none of the conventional scenarios and paradigms of the Neolithization of Bulgaria is viable without taking into consideration the Balkan flint outcrops and their discovery by the first Neolithic settlers or negotiating access to pre-existing Balkan flint exchange networks.

3. REGIONALITY VS UNIFORMITY IN EARLY NEOLITHIC FLINT INDUSTRIES

3.1. THE EARLY NEOLITHIC ASSEMBLAGES OF THE KARANOVO I CULTURAL ALLIANCE

This section includes data derived from 17 Early Neolithic assemblages that have been studied (including four which show Late Neolithic strata) (fig. 1). I have studied them over a long period of time and using different approaches, conceptual premises, and publication strategies. The following site assemblages have been published: Karanovo (Gurova 1997, 2002a); Azmak (partially – Gatsov, Gurova 2001); Yabalkovo (Gurova 2014a, Case study no. 5); and the case studies Slatina, Kovachevo, Rakitovo (Gurova 2011b; 2012b). A representative sample of the sites was used to distinguish the formal tools of Balkan flints and to support the suggestion that flints play a role in the Neolithization debate (Gurova 2008a; 2009; 2018b; Gurova Bonsall 2014a). Many of the studies are included in a short article in the Archaeological Discoveries and Excavations series. Some of the more recent research and from the most important sites is published as case studies here in Part II – Varbitsa, Dzhulyunitsa, Yarlovitsa and Ilindentsi. My observations on all the assemblages studied have helped me to provide an overview of the main characteristics of the flint industry and to define some regularity *vs* singularity/specificity. All the studied sites in south Bulgaria eventually became peripheral parts of the broader Karanovo I culture area. In line with this cultural complex, the dynamic model of cultural processes in Thrace is used (Nikolov 2004). A peculiar cluster of the southwest variant of the Karanovo I culture is the set of sites in the Struma Valley (mainly the middle and, to a lesser extent, the up-

per reaches of the valley) – Kovachevo, Ilindentsi, Brezhani, Drenkovo, Balgarchevo, Dzherman and Negovantsi. Some comments will be offered on the last-mentioned site, compensating for the lack of flints at Galabnik[7]. The other sites in south Bulgaria are geographically closer to the core area of the classical Karanovo I culture – Rakitovo, Kapitan Dimitrievo, and Yabalkovo. Tell Karanovo and Azmak were studied long ago, and my research on them lacked the later crystallized focus and cannot be compared with the more recently studied assemblages. However, they offer perhaps the most representative (at least, the most consistently used as labels for the "macroblade" industry) assemblages of formal tools made of Balkan flint. I found the Tell Kapitan Dimitrievo study to be both informative and insightful. The newly excavated Tell Musovitsa, marked on the map in fig. 1, is a promising site for shedding light on the Early to Late Neolithic transition[8]. The Early Neolithic sites from north Bulgaria – Varbitsa, Dzhulyunitsa and Yarlovitsa are presented in Part II as Case studies (nos 1–3). To further elucidate flint industries as a factor in the socio-cultural processes of the first half of the 6th millennium cal BC, those flint assemblages studied by me are presented here more coherently (with an accent on still unpublished/new assemblages) but tend to be interpreted and commented on in comparison to other Early Neolithic sites studied and published by other scholars.

Let's not forget that Gatsov published the first summary of the flint assemblages from western Bulgaria in 1993. Based on artefacts from seven Early Neolithic sites (Gradeshnitsa, Slatina, Pernik, Galabnik, Sapareva Bania, Balgarchevo and Kovachevo) and four Late Neolithic sites (Strumsko, Sapareva Bania, Damyanitsa and Topolnitsa), Gatsov came to the following conclusions: i) typical of the early assemblages, macroblades (mostly retouched) are made of high-quality yellow flint probably originating in northwest Bulgaria (this is Balkan flint in its true meaning); ii) during the Late Neolithic, raw material and technological degradation occur leading to abandonment of the high-quality flint (explained as "isolation" of people from the outcrops) and the microlithization of the industry is observed (Gatsov 1993, 41). From the instructive drawings, it is possible to identify the series of formal tools (presumably made of Balkan flint) and to follow the typological transformation from retouched blades (in the Early Neolithic) to a series of endscrapers (in Damyanitsa and Topolnitsa in the Late Neolithic). More information on this stage of interpreting the flint assemblages can be found in Gurova 2008a (p. 117).

Much later, based on numerous personally studied flint assemblages, coming from the most important Early Neolithic sites south of the Balkan mountains, such as Tells Karanovo, Azmak and Kapitan Dimitrievo, and the 'flat' sites of Kovachevo, Yabalkovo, Rakitovo and Slatina, I have argued for the recognition of a category of formal tools/toolkits (Gurova 2008a). The term 'formal tools/toolkits' is commonly used in the specialized literature. A definition is provided by Andrefsky, which reflects tools that possess or embody one or more of the following attributes: standardized form, additional effort in manufacturing, potential for resharpening, use of special raw materials, advance preparation, anticipated use and transportability (cf. Andrefsky 1994, 22).

Since then, in my study of other (Early) Neolithic assemblages from different regions, the concept of formal tools has been used as a discriminatory feature within all parameters of analysis and interpretation of the flint assemblages. Thus, this diagnostic feature of the assemblages

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7 After their publication in the 90s, the flint artefacts from Galabnik, Eleshnitsa and Sapareva Bania are, unfortunately, no longer accessible for study.

8 I studied the assemblage from the first season of excavation, but it remains unpublished.

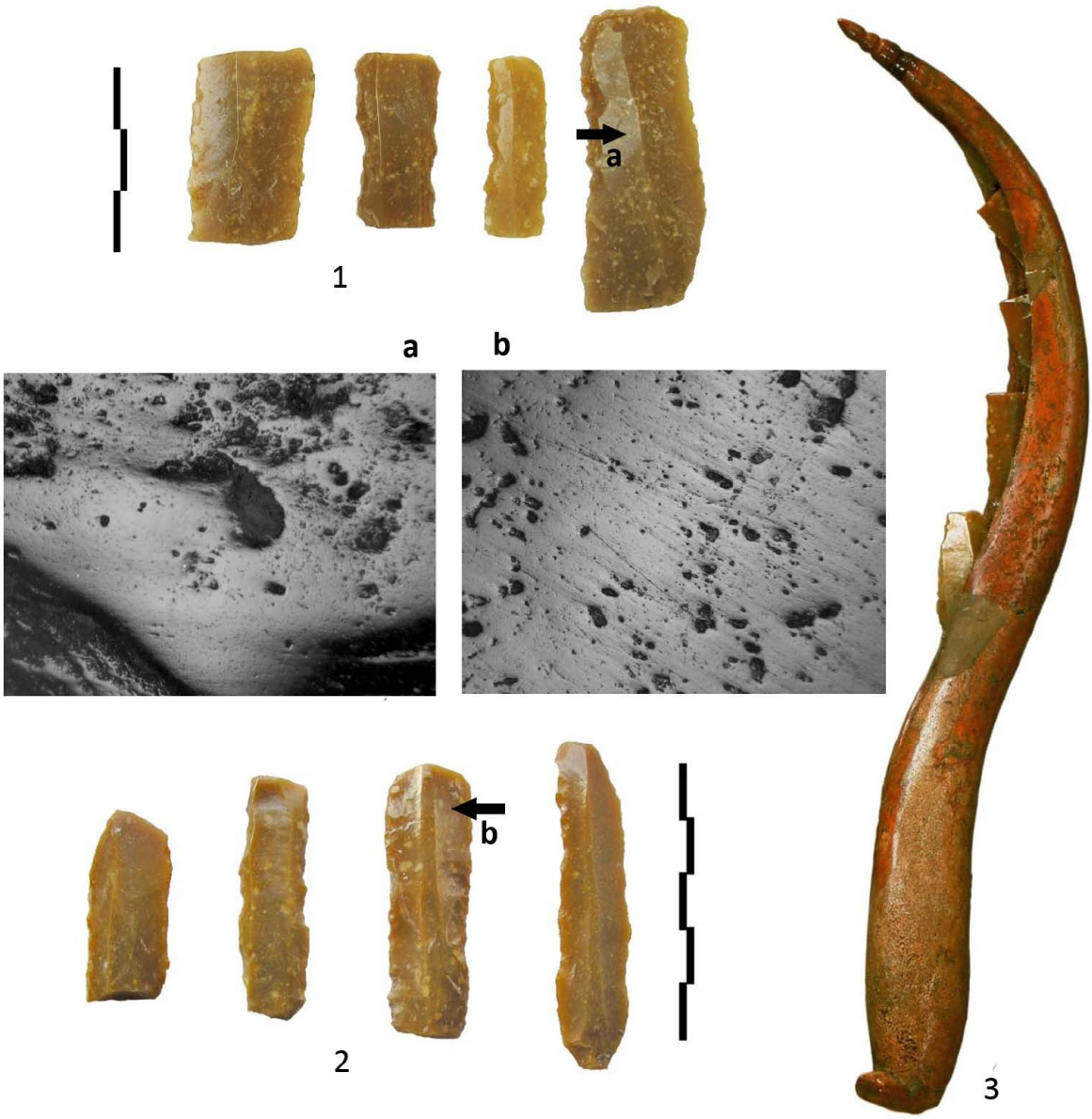


Fig. 21. Formal tools (sickle inserts) from the sites of Yabalkovo (1) and Kovachevo (2); 3 – Karanovo I sickle. Photomicrographs (x100) of typical cereal polish are taken at the points marked by an arrow (reproduced fig. 2 from Gurova 2018b)

serves as a reliable criterion for comparative analysis in both synchronic and diachronic aspects.

The formal tools comprise blades of visually similar yellow-brownish-greyish white-spotted Balkan flint, with continuous (sometimes partial) semi-abrupt to abrupt high retouch along one or both lateral edges, sometimes with pointed or rounded retouched ends, as well as sickle inserts related to the well-known Karanovo type of sickle (figs 17, 21). From a technological perspective, this industry indicates the application of indirect percussion (punch technique). Pressure flaking with an organic stick was used for the characteristic high, steep retouching[9]. It must be emphasized that neither cores nor common debitage linked to their preparation are attested among the assemblages; the *chaîne opératoire* remains fragmented with no possibility for diacritical reconstruction.

9 A representative series of formal tools was co-examined with J. Pelegrin in 2006 in Sophia Antipolis, France.

It is noteworthy that characteristic Early Neolithic Karanovo I and II flint toolkits from Bulgaria are recognized among different sites (cultural groups) of the supra-regional Karanovo I–Starčevo–Criş–Körös cultural technocomplex, as finished tools or simply as artefacts made of the Balkan flint (*vide supra* in paragraph 2.3.3).

The formal tools are a diagnostic feature of the Early Neolithic flint assemblages and a sign of affiliation with the Karanovo I–II cultural *koiné*. They are usually most numerous and representative among the assemblages from Tel Karanovo and Azmak (where the formal tools are dominant), followed by the sites of Yabalkovo, Rakitovo, Slatina, Kovachevo, Ilindentsi and others (Gurova 2008a; 2011a; 2012b; 2014b). It should be emphasized that the formal toolkits are present within Early Neolithic flint assemblages in varying proportions and at different stages of their evolution (well documented within the sites of the Middle Struma Valley). At Tells Azmak and Karanovo, they prevail and are evolved techno-typologically from the beginning of the respective cultural sequences.

As mentioned above, the formal tools are a diagnostic feature and hallmark of the Early Neolithic Karanovo I and II cultures and, as such, they accompany the pottery assemblages with the emblematic for Karanovo I white-on-red painting, illustrated in figures 22–25.

Apart from the formal tools, the Early Neolithic assemblages of all the above-mentioned south Bulgarian sites provide, of course, examples of expedient production of blanks (flakes and blades) and tools made of local, easily accessible raw materials. And while the presence of Balkan flint and the formal tools introduce elements of uniformity/homogeneity into the assemblages, the features of the expedient assemblages introduce specificity and regionality into the Early Neolithic flint industry. The local raw materials in different parts of the country vary (see fig. 11.2). A particularly rich spectrum of raw materials is found in the Rhodope mountains, which were accessible as secondary (placer) deposits in the river valleys.

3.1.1. THE STRUMA VALLEY SITES

The numerous (29) Early Neolithic sites of the Middle and Upper Struma Valley have been in the scholars' focus for decades, thanks to the most solid and provable scenario of an early wave of Anatolian migrants bearing the Neolithic package(s) from the Central Anatolia (Lake district) directly, or occasionally from northwestern Anatolia via Aegean seafaring. Moving northward along the Struma River, then turning east, the farmers reached the Upper Thrace (Nikolov 2017). Wherever the farmers originated, from the north Aegean to Bulgarian territory, their easiest pathway followed the Struma Valley, reaching what is still the earliest-known settlement – Kovachevo. This site is one of the most important Early Neolithic establishments in Bulgaria. As already shown, the beginning of the Kovachevo sequence falls around 6100 cal BC (Lichardus et al. 2006, 85; Lichardus-Itten 2022, 306, Table 18.1). This first occupation represents a local cultural facies with connections to Greek western Macedonia and Ovče polje, preceding the appearance of the Karanovo I cultural features, which start to emerge at Kovachevo in phases Ic and Id (Lichardus-Itten et al. 2002, 128; Grębska-Kulow 2024, 37). In the preceding phases of Kovachevo, no Balkan flint artefacts or formal tools are attested; they appear when the site became part of the southwest variant of the Karanovo I culture, in phases Ic–Id. Kovachevo Ia and Ib precede Karanovo I and represent a colonization event by Anatolian migrants (Lichardus et al. 2006, 86–88).

Thus, the wave of movement of the Kovachevo first farmers was not the origin of the later west-east spread of the bearers of the Karanovo I culture. Additional arguments against the Struma River as (one of) the main corridors linking the north Aegean with the interior of the

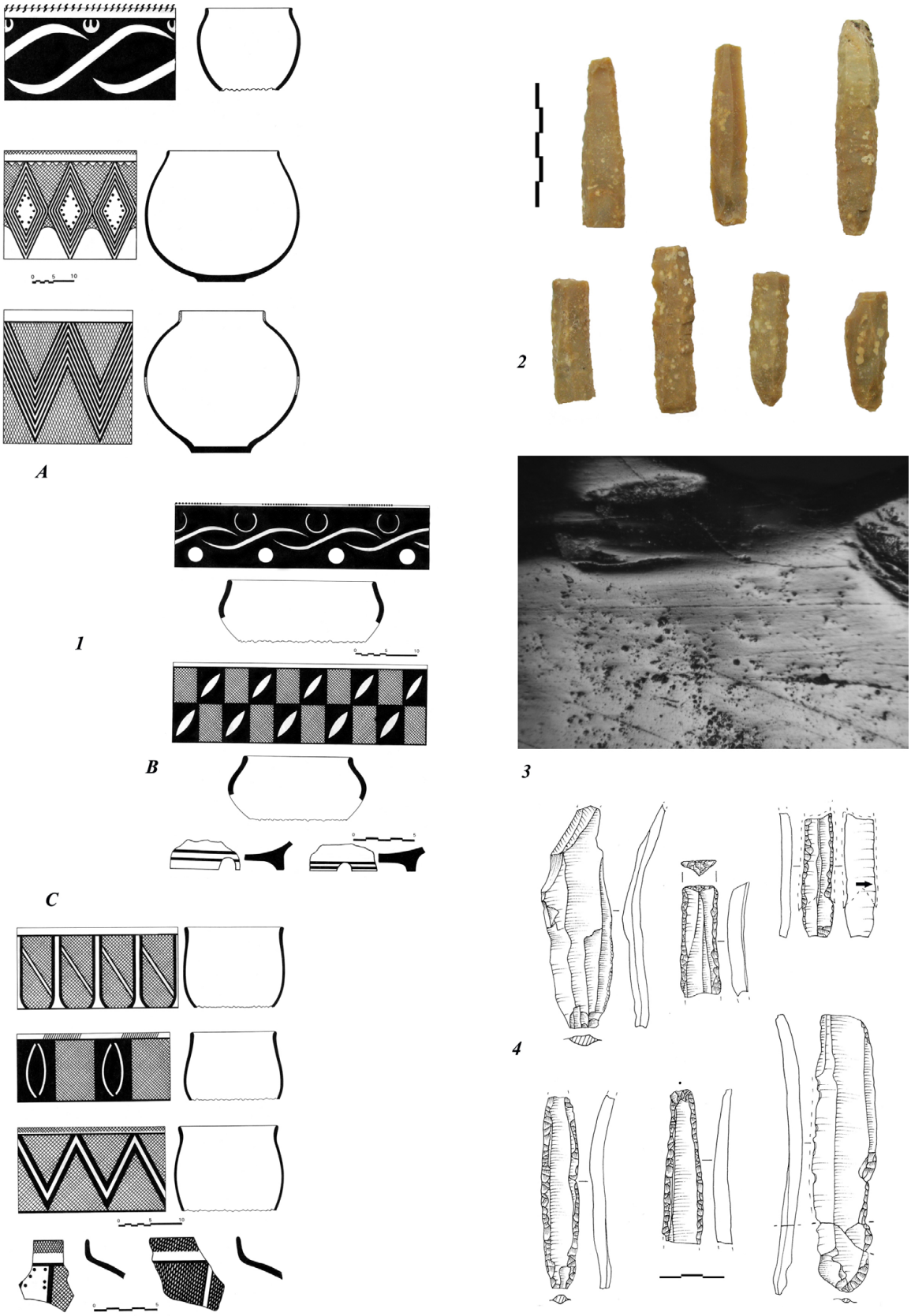


Fig. 22. Slatina: 1 (A–C) white-painted pottery style decoration (according to Николов 1992, figs. 61, 63, 64); 2. Formal flint toolkit; 3. Photomicrograph of the cereal polish (x100), see the arrow on the drawing below; 4. Flint artefacts (blade and tools) (reproduced in colour fig. 3 from Gurova 2012b)

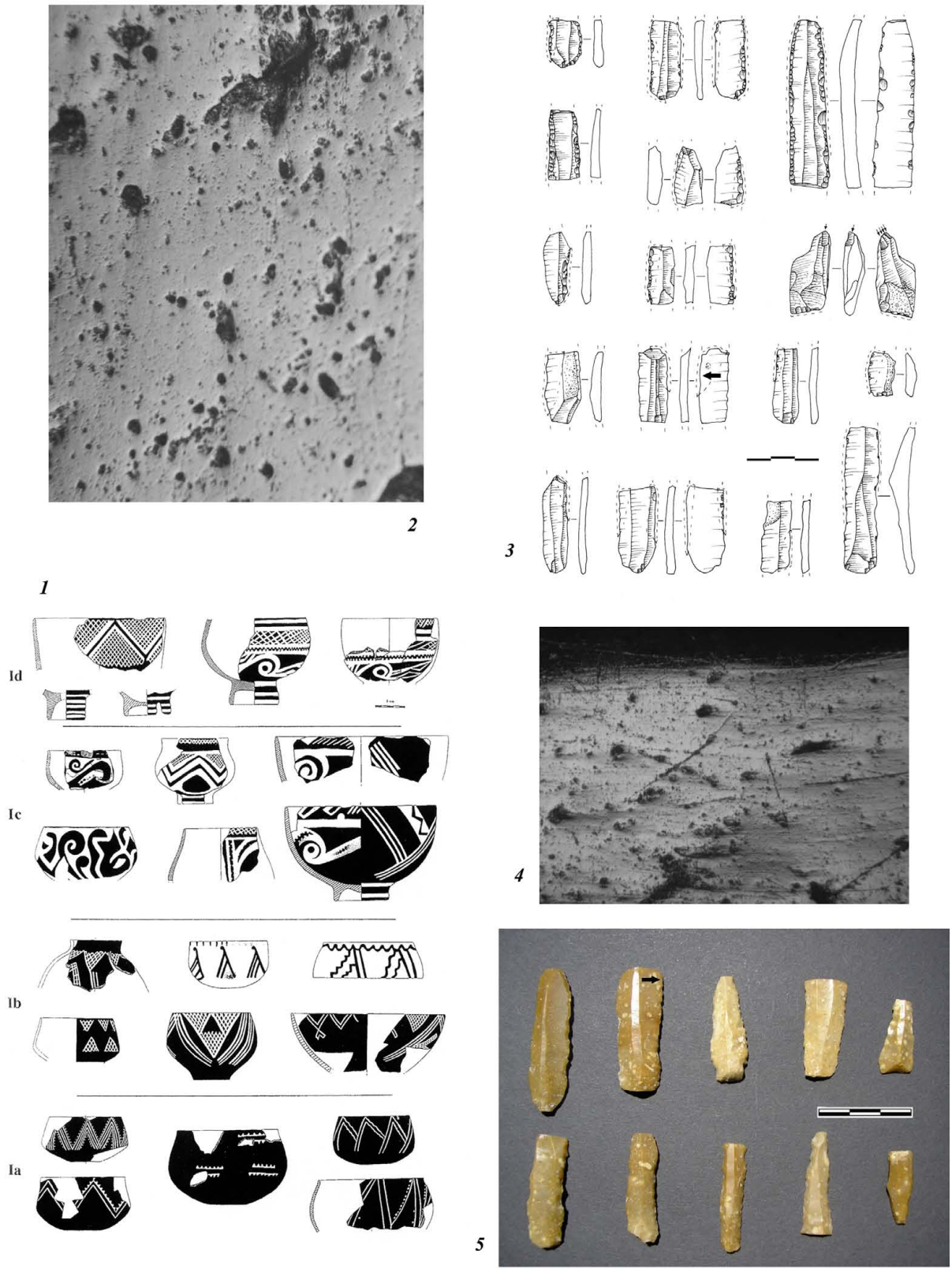


Fig. 23. Kovachevo: 1. White-painted pottery shapes and decoration (according to Demoule, Lichardus-Itten 2001, fig. 7); 2. Photomicrograph of cereal polish (x100), see the arrow in picture 5; 3. Flint artefacts (debitage and tools); 4. Photomicrograph of cereal polish (x100), see the arrow on the photo below; 5. Formal flint toolkit (including sickle inserts) (reproduced in colour fig. 4 from Gurova 2012b)



Fig. 24. Rakitovo: 1. White-painted pottery decoration: A. Rakitovo style; B. mixed style; C. Thracian style (according to Raduncheva et al. 2002, figs 86–88); 2. Formal flint toolkit; 3. Photomicrograph of cereal polish (x100), see the arrow on the drawing below; 4. Flint artefacts (tools) (reproduced in colour fig. 5 from Gurova 2012b)

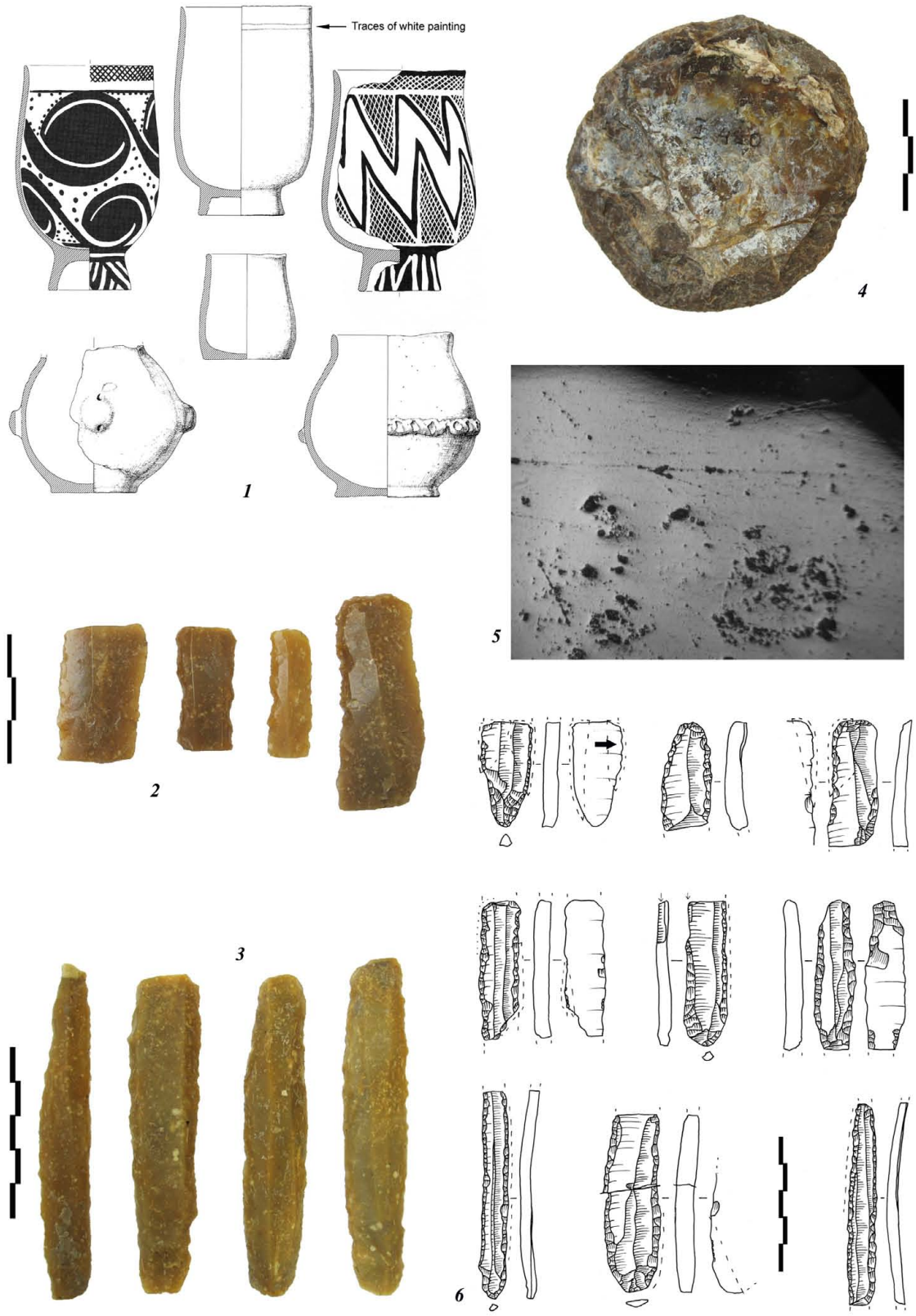


Fig. 25. Yabalkovo: 1. Pottery shapes and white-painted decoration (according to Leshtakov et al. 2007, fig. 10, scale 1:4); 2–3. Formal flint toolkit (2 – sickle inserts); 4. Flint hammerstone resharpened in 'discoid' form; 5. Photomicrograph of cereal polish (x100), see the arrow on the drawing below; 6. Flint artefacts (tools) (reproduced in colour fig. 6 from Gurova 2012b)

Balkan Peninsula were presented in a recent publication offering rich evidence of Neolithic sites in the Struma valley subjected to a regional diachronic and synchronic analysis in the context of supra-regional contacts of Early Neolithic Middle Struma settlements. The authors conclude that the "mountain passes channelled the contacts while the watercourse of the Struma functioned as a barrier to movements rather than as a highway" (Grębska-Kulow, Zidarov 2021, 1012). *Ergo*, an impediment arises in the axiomatic view of Struma theory proponents that Neolithization began via the Struma pathway, followed by an eastern movement into Thrace. However, this hypothesis is still officially dominant.

The Balkan flint formal toolkit and blades appear in Kovachevo as a novelty, together with the Karanovo I pottery decoration system (Gurova 2011b; 2012b) (figs 23, 26–27). Balkan flint artefacts represent ca 5% of the entire chipped-stone assemblages from the site[10], but that does not mean they are negligible – first because they occur at a later stage in the sequence and second, because they are very representative by themselves, combining the best examples of typological variety and sickle-insert repertoire. Here, it is worth noting that early in the site's habitation, the raw materials were primarily based on the geological diversity in the Rhodope volcanic zone. A large portion of the artefacts is made of a dark grey to black variety of atypical flint (chert?) from the western Rhodopes, investigated in the past by M. Pawlikowski in the context of open-air Late Palaeolithic sites in the region[11]. One of the best manifestations of this raw material is the series of more than 100 micropierces/borers showing a broader range of morphometric characteristics, with short to medium tips (3–9 mm) not always clearly separated by the body, fashioned by semi-steep to abrupt lateral retouch (fig. 28). The functional predestination and efficacy of such microborers (reproduced experimentally) were tested in a drilling experiment with fascinating results (Gurova et al. 2013). It is questionable if the purpose of this remarkable toolkit was to be involved in the craftsmanship on the site, because no significant quantity of perforated personal ornaments was discovered *in situ*.

At Ilindentsi (northwest of Kovachevo), another smaller series of micropiercers/borers was recorded *(vide infra)*. Again, the evidence of adornment from the site was too scarce to correspond to the potential of the toolkit. On the other hand, far to the north of both sites in the Upper Struma Valley is the intriguing site of Galabnik, where an incomparable series of bead necklaces[12] with a reconstructed combined length of 14 m (!) was found (Pavúk, Bakamska 2021). X-ray analysis revealed the mineral composition of the beads as marble, limestone schists, serpentinite and nephrite (jadeite?), whose origin remains unknown (Костов, Бакъмска 2004) (fig. 29). The most remarkable feature is that the perforations consistently have a diameter of 1.2 mm, which is challenging to reproduce in experimental work. Here is the place to note, assuming the existence of workshops for micropiercers/borers at both Kovachevo and Ilindentsi, although their respective *chaînes opératoires* remain incomplete, that their products were made for export to another site, such as Galabnik, where no toolkit is recorded. Regardless, a remarkable amount of personal ornaments was present. There is an apparent discrepancy between the production area/workshop and the final product – an all-too-common occurrence in the archaeological archive of Bulgarian prehistory. A typical case study of a workshop of micro-

10 The chipped stone industry from Kovachevo remains unpublished. I was allowed to present some aspects of the typological repertoire in the context of specialized research. I respect these restrictions here as well.

11 His research, unfortunately, remained unpublished.

12 The site was excavated by M. Chahadzhiev. Information about the necklace and permission to photograph it was provided by A. Bakamska.



Fig. 26. Artefacts and Balkan flint formal tools from Kovachevo



Fig. 27. Artefacts and Balkan flint formal tools from Kovachevo (3 – sickle inserts)

piercers/borers, associated with onside cockle shell beads, comes from Franchthi cave (Argolid, Greece), where the toolkit shows evident standardization in form and technique in support of the hypothesis of craft production of beads, going even beyond the needs of the local community (Perlès 2023). In our case of the above-mentioned discrepancy, two explanations are possible: i) very active contact and exchange between inhabitants of the Struma valley sites in both directions – export of drilling toolkits northward and southward import (from an unknown centre) of Balkan flint blades and formal tools; ii) the micropiercers/borers are just a fragment of an apprenticeship process which corresponds to their heterogeneity and lack of metrical, technical and functional standardization.

Among the cluster of Early Neolithic sites in the Middle Struma Valley, the site of Ilindentsi (on the left side of the River) represents an interesting case study of a chipped-stone assemblage. The site sequence belongs to the second half of the Early Neolithic, synchronous with Kovachevo Ic–Id (Grębska-Kulow 2017, 250; 2024) and was plausibly founded by people from Kovachevo during its Ic phase (Grębska-Kulow 2024, 39). The close similarity with Kovachevo is well demonstrated by the chipped-stone assemblage in raw material variety as well as in the typological repertoire, including micropiercers and a small series of artefacts (mainly formal tools) of Balkan flint (fig. 30). The assemblage is presented in detail in Part II of the book (Case study no. 4).

Furthermore, to the north is the Brezhani site at an elevation of 650 m above sea level. The village was established (like Ilindentsi) ca 5900 cal BC and shows clear elements of the Karanovo I culture, as well as contacts with the Galabnik group (Гребска-Кулов и др. in press;

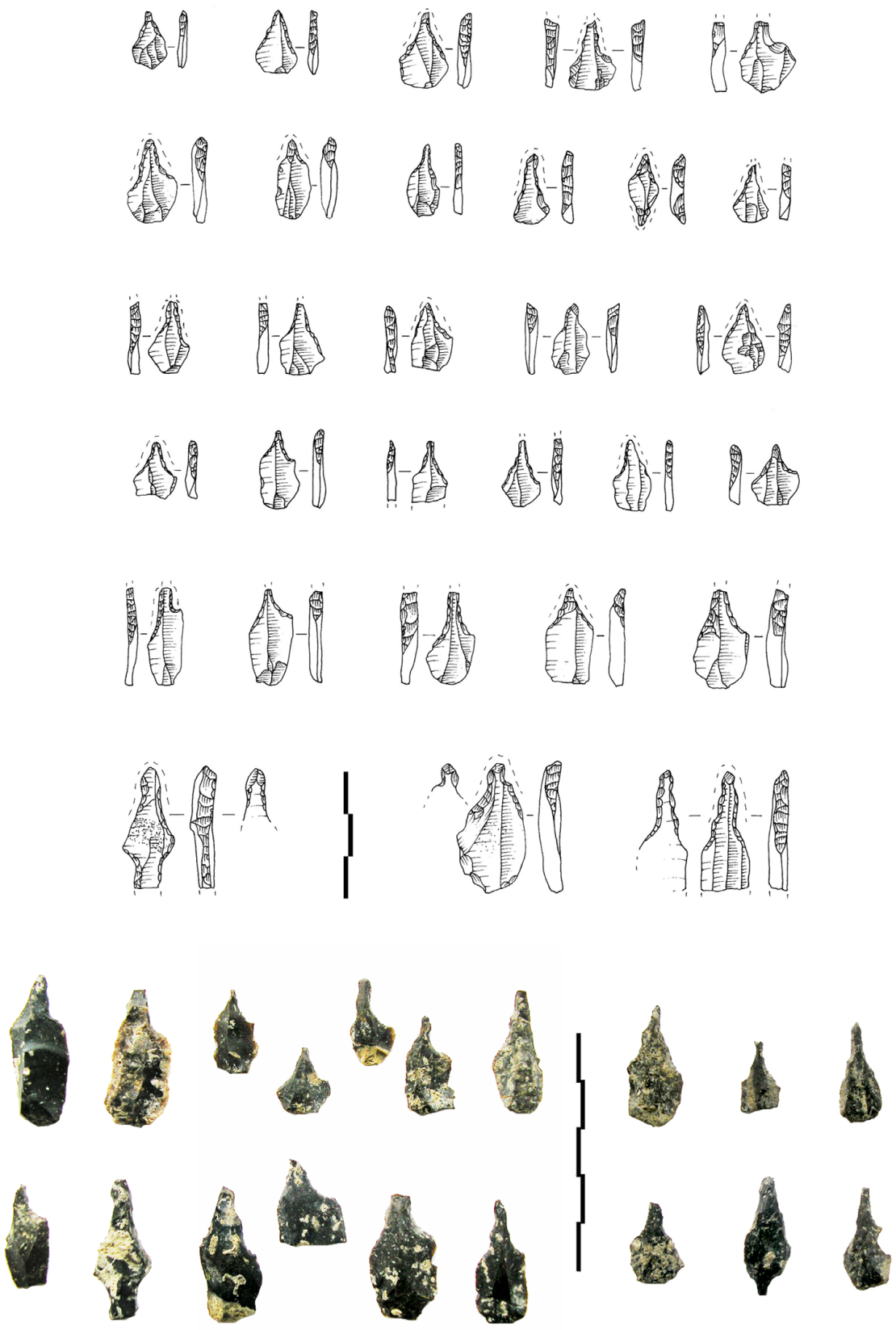


Fig. 28. Kovachevo – micropiercers/borers



Fig. 29. The necklace(s) from Galabnik

Grębska-Kulow 2017, 253; 2024, 39). The flint assemblage from the site is very scarce, comprising 10 pieces, four collected during a previous survey in 2009 and six during the excavation in 2023. Most of the artefacts are visually of Balkan flint, and four of these are formal tools (fig. 31).

Northwest of Brezhani is the site of Drenkovo, with a very early date of establishment, dating back to the final two centuries of the 7th millennium BC. A small-scale trench excavation in 2003 revealed pottery similar to that of Kovachevo Ia and Ib, with close parallels to Anzabegovo (Grębska-Kulow 2017, 253–254; 2024, 40). The excavator did not see any indication of Karanovo I cultural elements. However, among the ten flint artefacts, there are three of Balkan flint, which were certainly imported to the site. It should be emphasized here that the sites of Brezhani and Drenkovo are included in our multidisciplinary research on Balkan flint and have confirmed the affiliation of their artefact inventories with north Bulgarian sources of Balkan flint (Gurova et al. 2022b) (see fig. 14.5–6).

The last site in the Middle Struma valley – Balgarchevo – emerged in the Early Neolithic and shows an apparently continuous sequence till the late Chalcolithic, followed by discontinuous habitation phases in the LBA and Antiquity (Pernicheva et al. 2011). The Early Neolithic at Balgarchevo does not exhibit features characteristic of the typical Karanovo I culture, but instead shows close parallels with sites in North Macedonia. These features in the pottery assemblage are attributed to the emergence of a new Starčevo population at the end of the Early Neolithic (Grębska-Kulow 2024, 41). I was provided with the flint collection from Balgar-

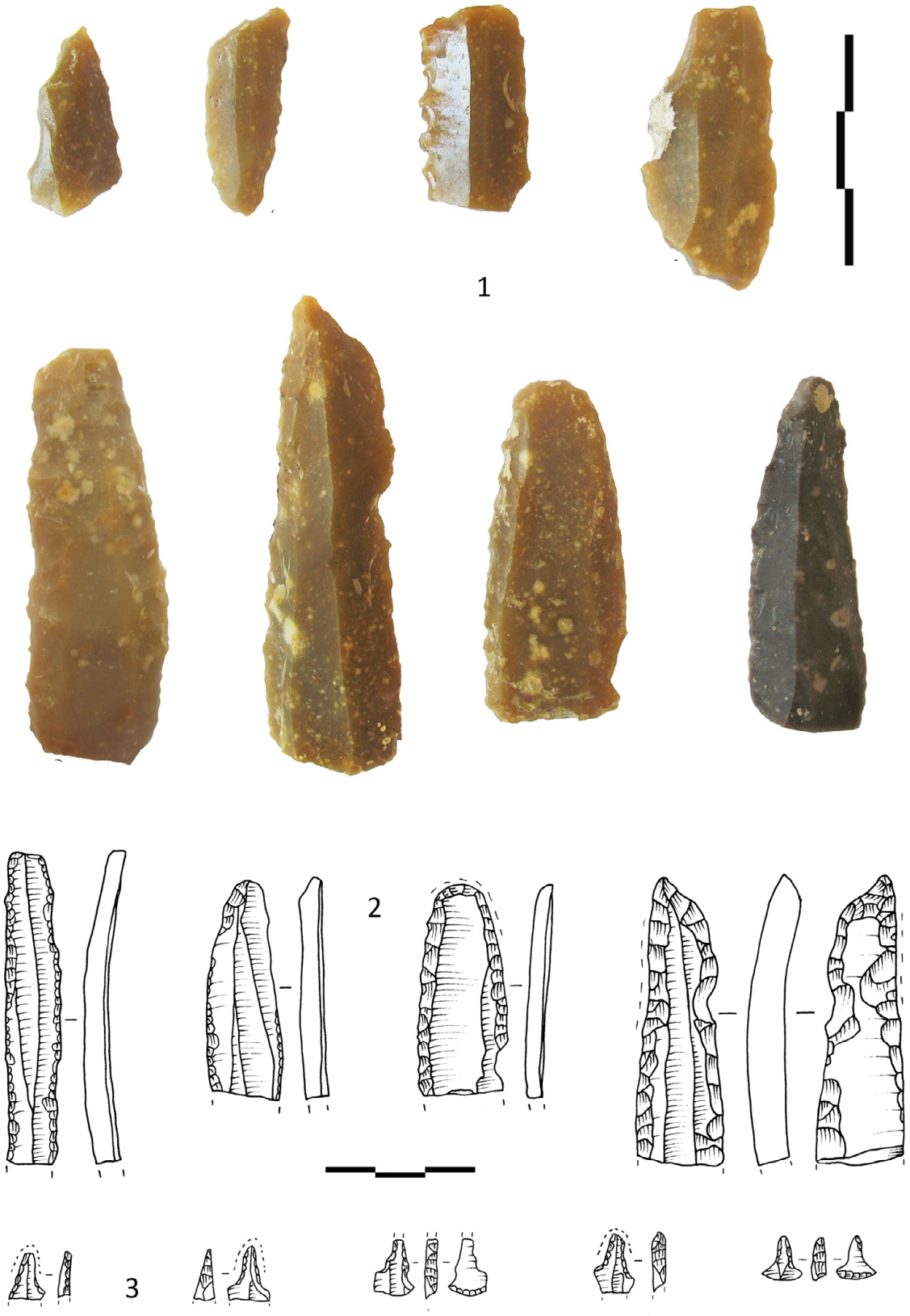


Fig. 30. Ilindentsi: Balkan flint tools (1) and example of the typological repertoire (2)

chevo, which lacked a clear distinction between Early and Late Neolithic assemblages[13]. There was a difference in how the post-Early Neolithic strata of the site and their synchronization with Karanovo periodization were treated by L. Pernicheva and V. Nikolov (Николов 1998, 301, contra Perničeva 2002, 301). Part of the assemblage (40 artefacts) has been studied and published by Gatsov, and they all were attributed to the Early Neolithic (?) (Gatsov 1993, 32–33). The assemblage I worked on contained 69 artefacts, of which 22 were tools. Retouched blades are most common, followed by endscrapers and single examples of a splintered piece, a truncation, a perforator and an atypical segment (fig. 32). Despite the mixed character of the assemblage there are three Balkan flint formal tools (fig. 32.5–7) which can be attributed to the Early Neolithic, but equally could be reminiscent forms of the diagnostic Karanovo I tools among the Late Neolithic assemblage. The endscrapers, as a series, at least suggest the Starčevo influence (for the characteristics of Starčevo assemblages, see the Discussion section in Case study no. 3).

Among those specialists with the longest and most profitable research on the Middle Struma Valley sites, M. Grębska-Kulow has provided the most instructive information and insights on the Middle Struma cluster. She distinguishes four stages in the Neolithization of the region, which can be summarized as follows:

- Stage 1 (6200–6000 cal BC) – establishment of Kovachevo Ia and Drenkovo I with connections to northern Greece, Thessaly and Pelagonia;

- Stage 2 (6000–5900 cal BC) – appearance of farming settlements in the Upper Struma belonging to the Galabnik and Nevestino groups, contemporaneous with the Kovachevo Ib period);

- Stage 3 (5900–5700 cal BC) – more intensive contacts along the Struma Valley; establishment of Brezhani and Ilindentsi; Kovachevo Ic and contacts to the east – to the Mesta, Maritsa and Karanovo I culture;

- Stage 4 (5500–5450 cal BC) – appearance of new settlements with different cultural features: Drenkovo II, Kalimantsi, Pokrovnik – founded by people from Starčevo cultural communities (Grębska-Kulow 2024, 41–42).

In her interpretation, the River loses its “pathway” role in favour of the mountain passes, which became the main communication and control points. During the long Early Neolithic period in the region, many multidirectional movements were carried out alongside the traditionally assumed (and overestimated) north-south axis. Of particular interest is the supposition that local Mesolithic groups interacted with the new farming communities during the period between the first migrant wave to northern Greece and the next one, leading to the foundation of Kovachevo (ibid., 44). In this respect, it should be recalled that the most numerous series of Early Neolithic geometric microliths (10 items) comes from Kovachevo, compared to nine from Ohoden, five from Yabalkovo and three from Dzhulyunitsa (fig. 33).

The site of Dzherman in the upper Struma Valley was excavated as part of the rescue infrastructure project of the “Struma” highway. Thanks to the interdisciplinary studies carried out on-site and subsequently on the finds, a range of interesting information was gained, from geomorphology to the exotic obsidian blade (Иванов и др. 2016). The site was subjected to severe geomorphological impact during and after the cooling event at the end of the 7th millennium cal BC. Due to massive mud and stone flows from the surrounding hills, all Early Neolithic features were found translocated, often redeposited in negative features/pits. The pottery exhibits poor

13 Publication of the results is awaiting for finalization of the volume 2 of the Balgarchevo series.

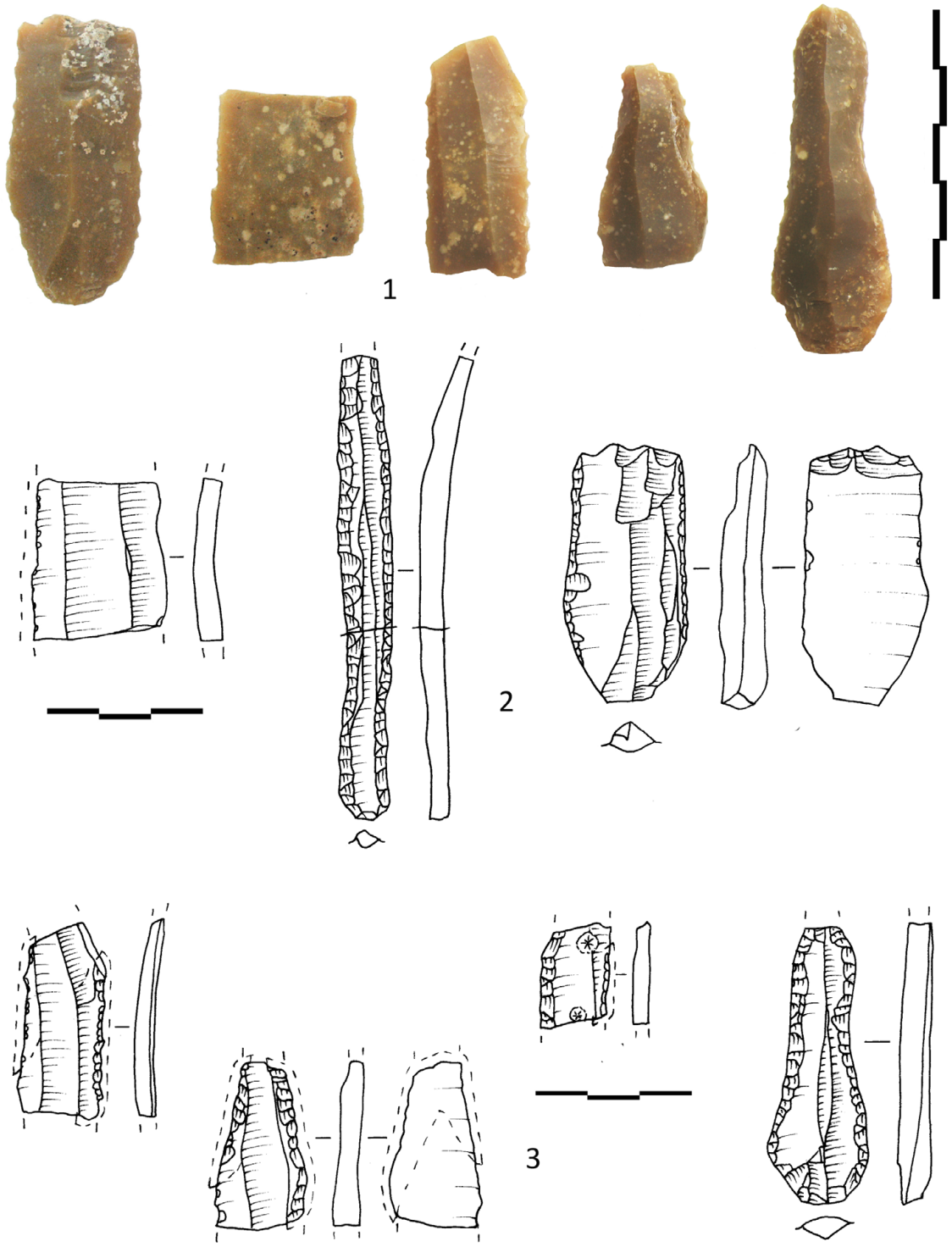


Fig. 31. Brezhani – Balkan flint tools: from the new excavations (1, 3), from the surveys in 2009 (2)

preservation without clear parallels with the Middle Struma assemblages. Unfortunately, AMS dating was unsuccessful. As for the chipped-stone assemblages, they were not numerous, but intriguing. Among the raw materials, quartzite is noticeable (and easily accessible within the gravel deposits along the Struma River and its tributaries, as well as a jasper variety from the Rhodopes, and a smaller quantity of recognizable Balkan flint (fig. 34.3–5). The chipped-stone assemblage contains four categories of artefacts: 21 flint (*sensu lato*) artefacts, one obsidian

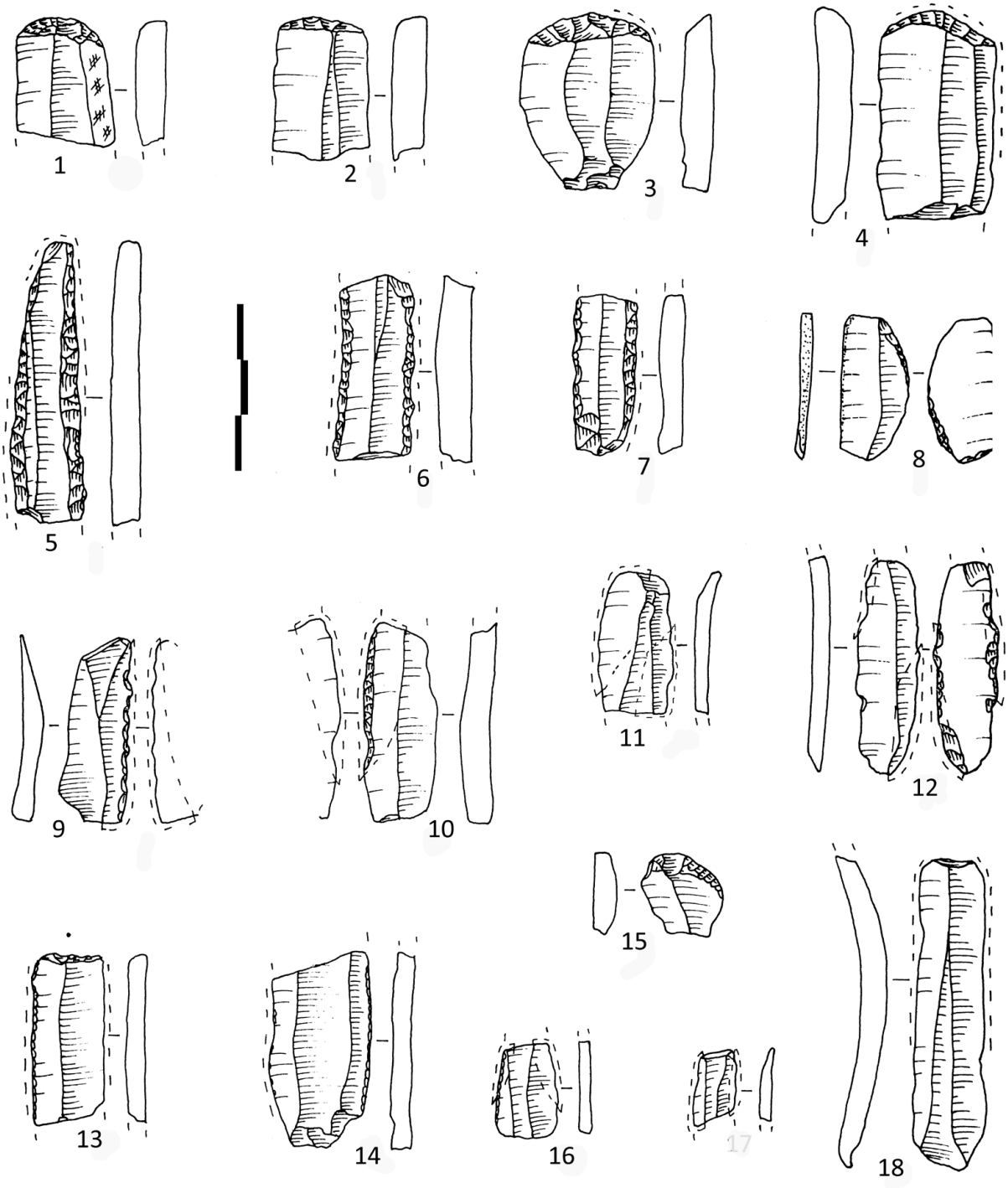


Fig. 32. Balgarchevo – flint artefacts

blade, artefacts of quartzite and coarse-grained rocks obtained from river gravels. Among the flint artefacts are six typological tools (retouched blades and flakes and one endscraper), 11 blades, two flakes, one fragment and one retouched flake/spall (fig. 34.1). Eleven artefacts (two of which are retouched plus nine virgin blades) are made of Balkan flint. There are 29 quartzite debitage products (small flakes) (fig. 34.5) and three quartzite hammerstones (fig. 35.1–3). A third group consists of four rocks (from river gravels) used on the convex surfaces for different functions (fig. 35.4). Apart from the primary function of the hammerstone in the

knapping process, very often (as in the concrete case) they are reused as pestles/broyons, involved in household activities such as food production (cereal grinding), mineral crushing, or even polishing (Hamon 2014; Vučković, 2019). The presence of hammerstones corresponds to the very high concentration of grinding stones on the site, the study of which has not been completed. Undoubtedly, the most exotic and rare artefact is the mid-fragment of an obsidian blade with matte utilization retouch and microwear traces – matte lateral bands with fine striations and microchipping, suggesting plant cutting, possibly cereal harvesting (figs 34.2, 36). Portable XRF analysis identifies the source as the Carpathian 1 (Cejkov-Viničky) source area in Slovakia (Bonsall et al. 2017, Table 2). The obsidian blade from Dzherman is significant in its own right, given the scarcity of obsidian artefacts from Bulgaria, and also because it is currently the southernmost point (considering Bulgaria and Serbia) of Carpathian obsidian occurrence. Its Carpathian *vs* Melian provenance is significant and may mark the northern frontier of the broader Aegean obsidian network. A deeper look into the dataset of the latter is needed to confirm/deny this supposition.

The last two sites in the Upper Struma valley to mention here are Galabnik and the nearby tell settlement of Negovantsi. As mentioned above, the flint assemblage from Galabnik was briefly published by Gatsov (1993). Sixty-three artefacts from three phases are attributed to the Early Neolithic sequence (17 typological tools and 46 blades, mostly fragmented). The tool repertoire consists of retouched blades – 14, perforators on blades – two; backed blade – one; truncation – one. The blades are defined as massive with irregular, marginal, and high retouch. The raw material is exclusively a waxy-yellow, high-quality flint (Gatsov 1993, 30). From the description and the 13 drawings (Plate 1), it seems that a hallmark of the assemblage is a representative series of formal tools of Balkan flint. Galabnik is very important in the Early Neolithic sequence in Bulgaria (giving its name to the specific western pottery style group) and offering very early dates for its establishment, 6070/50–5910/20 cal BC (Thissen, Reingruber 2017, 138) and 6031,5 cal BC (Krauss 2023, 242, table 7).

I studied a small assemblage of flint artefacts discovered at the Negovantsi site during the trench excavations in 1996 (Zidarov, Bakamska, in press). The pottery typochronology from Negovantsi shows parallels with Galabnik, both in its first phase and in the later stages of the extended Starčevo tradition (ibid., 18). The flint assemblage comprises 21 artefacts: eight typological tools (seven retouched blades and one atypical endscraper), 12 debitage products (four blades, four flakes, four fragments) and a single-platform flake core with two adjacent removal/debitage surfaces (figs 37–38). Twelve artefacts are made of Balkan flint – all tools among which is one retouched blade belonging to the formal tools category, three blades, and one indeterminate fragment (fig. 37.2). Among the raw materials, apart from Balkan flint and quartzite, there are two raw material varieties with unknown origins (the core is made of one of them). It is noticeable that the only core is the product of opportunistic production using (local, regional?) raw materials, while the Balkan flint *chaîne opératoir*e remains allochthonous/introduced. The proximity of Negovantsi to the Slatina site, where the only securely identified flint production workshop is located, makes it possible to envisage export from the workshop to neighbouring sites with subsequent involvement in the north-to-south Balkan flint provisioning network, which reached the southernmost Middle Struma Valley Early Neolithic sites.

To sum up, the Struma Valley assemblages demonstrate common features from Kovachevo to Negovantsi – namely the presence of Balkan flint artefacts and formal toolkits (typically retouched blades and sickle inserts). Chronologically, at Kovachevo this process starts in phase Ic (ca 5900 cal BC – Stage 3 according to Grębska-Kulow 2024 (*vide supra*), while in the northern

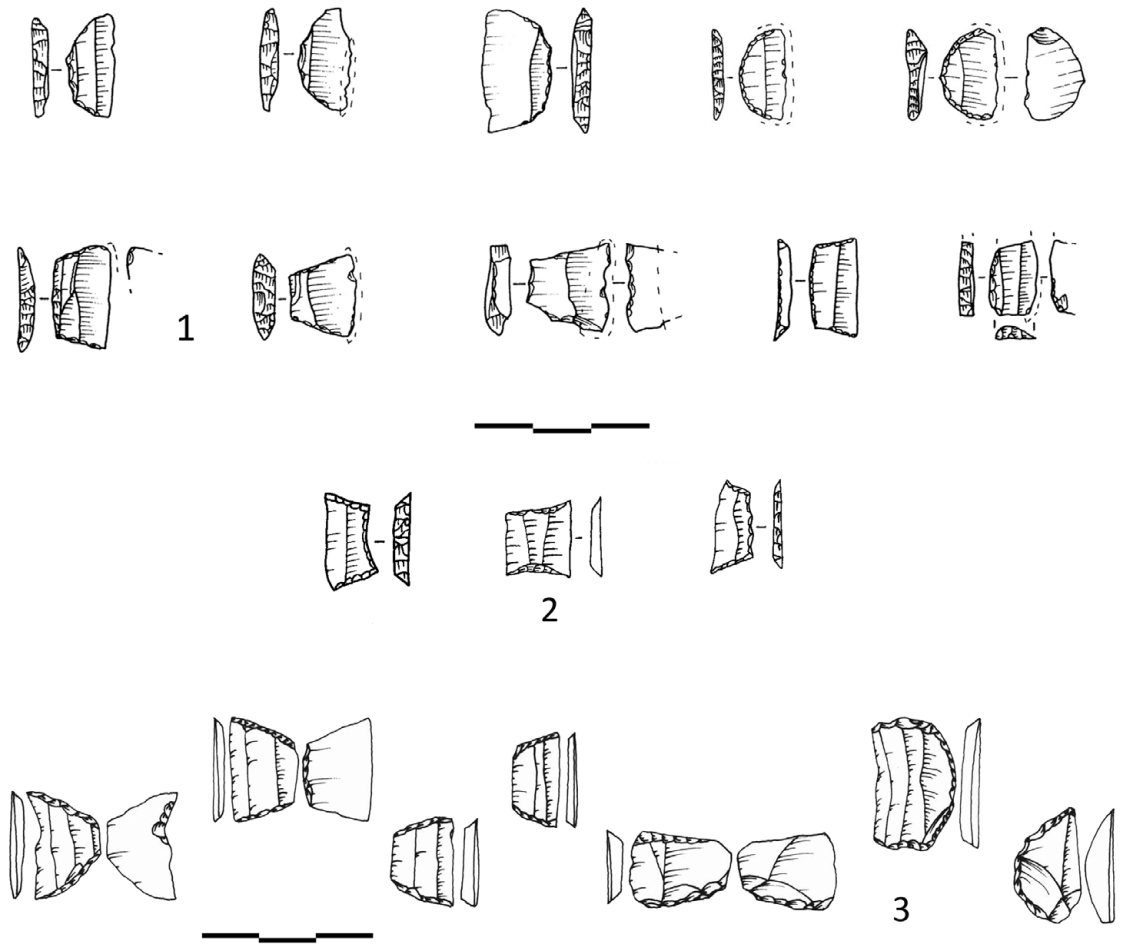


Fig. 33. Geometric microliths from: 1. Kovachevo; 2. Dzhulyunitsa; 3. Ohoden (3 – after Zlateva-Uzunova, 2009, fig. LIII, 1–7)

part (Galabnik and Negovantsi) approximately a century earlier, which corresponds to the presumption (and seemingly the unique practical possibility) that the Balkan flint 'package' was introduced from the north (via or bypassing the Slatina workshop). *If* and *when* Balkan flint -like sources are discovered in North Macedonia, then other distribution scenarios will be possible. Apart from the Balkan flint acquired here through supra-regional distribution (over 100 km), local and regional network-operated provisioning of raw materials from the Rhodopes, quartzite was available along the entire river course as gravels/placer deposits. A peculiar techno-cultural facies is represented by the abundance of micropiercers/borers (at Kovachevo and Ilindentsi), suggesting predetermined production of toolkits for specialized craftsmanship related to personal adornments.

From a subsistence economy perspective, developed agricultural practices are confirmed by the presence of sickle inserts, particularly at Kovachevo and Ilindentsi. It is notable that from the earliest phase at Kovachevo, there are sickle elements with diagonal polish, indicating the use of the Karanovo type of sickle before its appearance in the eponymous tell in Thrace, as noticed years ago (Gurova 2012b). The presence of geometric microliths in the earlier strata of Kovachevo suggests a pre-Neolithic substratum marginally introduced into the adoption of the Neolithic lifestyle. This statement accords with Grębska-Kulow 2024 (*vide supra*), and contra R. Krauss, who postulates that ... "If a pre-Neolithic population had lived within the region, then



Fig. 34. Artefacts (1) and present raw materials from Dzherman: obsidian (2); Balkan flint (3); jasper (4) and quartzite (5)

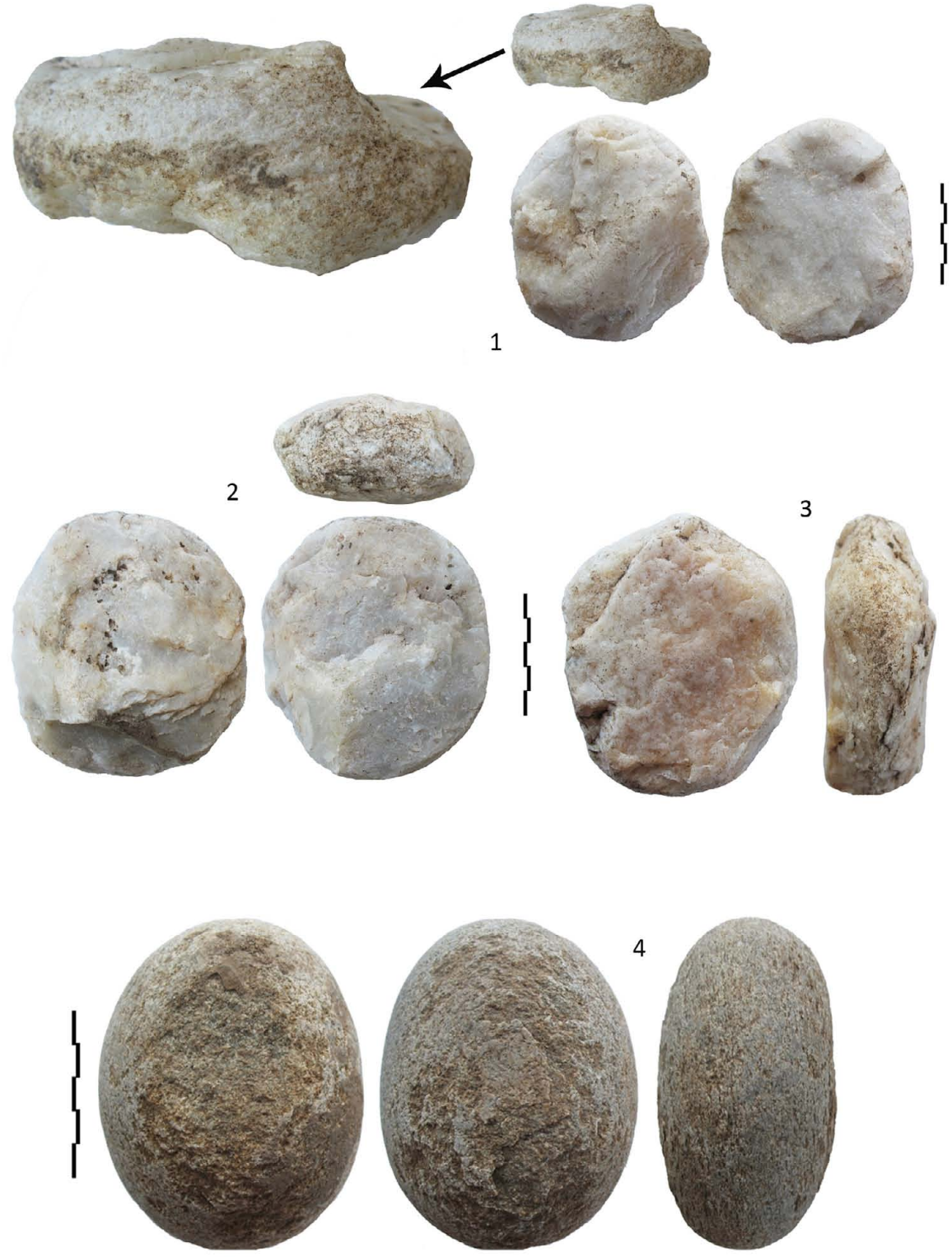


Fig. 35. Dzherman quartzite (1–3) and coarse rock hammerstone/grinder (4)

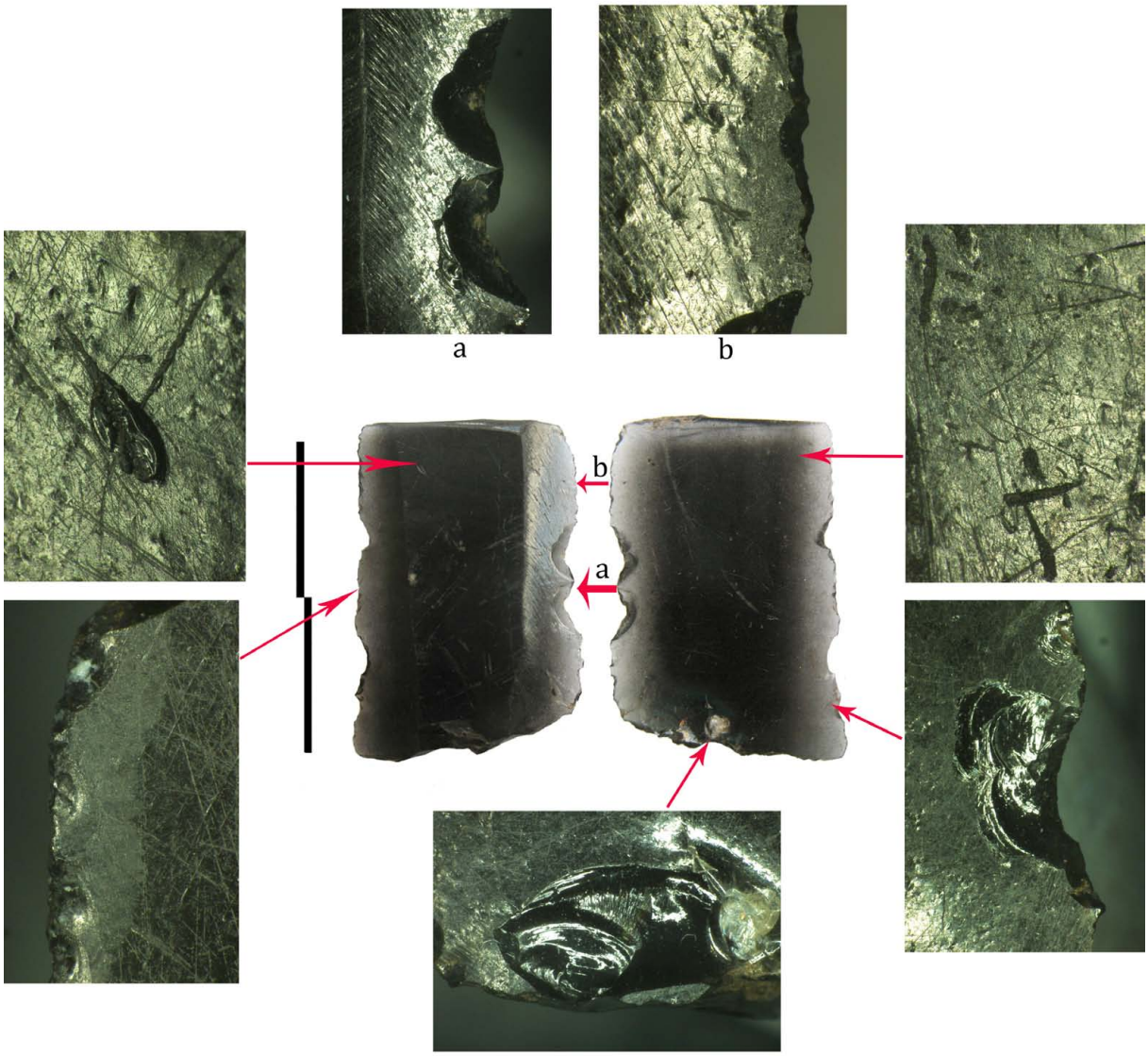


Fig. 36. Dzherman – obsidian blade with photomicrographs (x20, x80) of the used edges and of the significant surface wear (reproduced fig. 17 from Bonsall et al. 2017)

this played no demonstrable part within the transmission of Neolithic cultural elements into the Balkans. Only groups already fully versed in the Neolithic economic model and accompanying their herd animals can plausibly be considered to have been agents in the Neolithization of the Struma Valley"(Krauss 2023, 97). Whether the first farmers came from the Lake District via direct maritime seafaring [as in the case of Greece – see Lichardus-Itten 2022 and Perlès 2005] or via northwest Anatolia is still difficult to say.

3.1.2. THE SOFIA PLAIN AND UPPER THRACE

There are no objections against the fact (even in controversial scenarios) that the archaeological evidence suggests a secondary Neolithization of Thrace. "It is quite possible that the broad floodplain of the Maritsa may conceal even earlier Neolithic settlements beneath its sediment deposits. Nevertheless, according to the current state of research, Thrace is depicted as a zone of secondary Neolithization, while regions such as the Struma Valley and northern Bulgaria show



Fig. 37. Negovantsi: artefacts (1) and Balkan flint blades and tools (2)

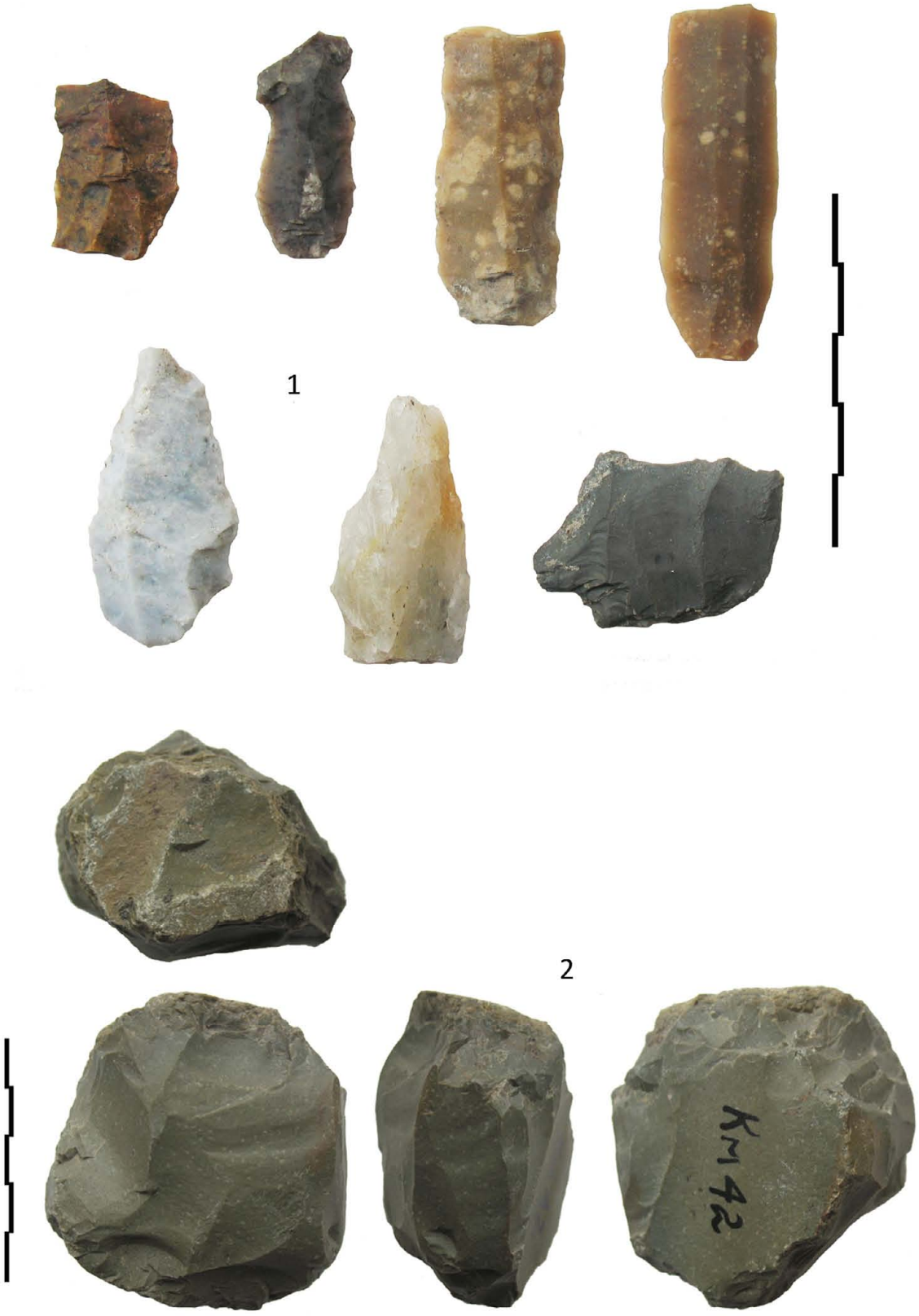


Fig. 38. Negovantsi: raw material variety (1) and single-platform flake core (2)

earlier Neolithic settlement, despite being geographically further afield. As a result, the question as to the identity of the carriers of the Neolithization process into Thrace remains difficult" (Krauss 2023, 130–132). This statement aligns well with my ideas of pre-Karanovo contacts between north Bulgarian sites, which transferred to Thrace or at least mediated the provisioning of Thracian sites with Balkan flint and its products.

As for the flint assemblages, Slatina and Rakitovo were partially studied and published by Gatsov (Гацов 1992; Радунчева и др. 2002). Yabalkovo has been studied and published by R. Zlateva-Uzunova (Zlateva-Uzunova 2014; Златева-Узунова 2025). All three sites were also studied by me (Yabalkovo, as selected material) and were presented and commented on in some of my previous publications (Gurova 2012b; 2014a; Gurova, Bonsall, 2014a). Yabalkovo is presented here in Part II as Case study no. 5. The assemblages from Karanovo and Azmak were studied by the team of Gatsov and Gurova, with subsequent publications. What is worth recalling here is that these sites provide one of the most representative examples of formal toolkits – in both quantitative and qualitative senses (figs 17; 22–27; 39–40). In retrospect, the first highlights of the Balkan flint formal tools led Gatsov to promote the term 'Karanovo blades', embracing abruptly-retouched blades, based on the 'macroblade' technology. Gatsov defines the Karanovo and Azmak area as the "centre" of this 'macroblade' production (Gatsov 1995, 157; 2009). Thus, he started to promote the so-called 'Karanovo blades' as a counterpoint to the overall variability of the northwest Anatolian techno-typological complex. From a techno-typological viewpoint, given the representativeness in terms of both quality and quantity of this tool category, referring to them as Azmak tools/blades would be more appropriate. The term Karanovo blade, as such, refers to the eponymous site and/or to some of the distinguished Karanovo cultures, and there are too many, at least two for the Early Neolithic; however, this label does not seem unequivocal. It should be remembered that these Balkan flint formal tools survive a retardation and reappear under a reminiscent form until Karanovo III–IV and IV at Tell Karanovo itself and in almost all sites with Late Neolithic strata. Although his approach was restricted to a relatively small area of the Early Neolithic cultural background, Gatsov's general observations nevertheless provided a basis for further interpretation. The Balkan flint formal tool distinction that I made represents the next step in the conceptual interpretation of the Neolithic flint inventories. It is worth recalling that for the origin of both yellow and greyish white-spotted flints, which are the most numerous among the flint assemblages of Tells Karanovo and Azmak, a locality near the St. Iliya Hills in Thrace was proposed as the source area (Gatsov, Kurčatov 1997). This geologically unproven supposition was not supported by specialized analysis. In light of recent interdisciplinary research on Balkan flint, this repeatedly quoted assumption could be considered as firmly disproved. The fact that in both tells (as well as at Rakitovo and Yabalkovo) the Balkan flint formal toolkits appear in a perfectly evolved form – without a preceding stage of the *chaîne opératoire* and as relatively narrow, abruptly-retouched blades, evidently subjected to multiple resharpenings/rejuvenations with both utilitarian and stylistic intentions. This suggests that at some stage in the site's functioning, a shortage of blanks (hence Balkan flint as raw material) occurred, leading to further overuse of the tools, including some cases of secondary debitage of Balkan flint blanks. This brings us back to the Balkan flint networks.

In the interdisciplinary research on Balkan flint, the archaeological samples from Slatina, Yabalkovo, and Karanovo have contributed much to the scientifically-based and analytically proven links between these sites in the invisible yet incontestable networks connecting the Thracian site consumers with the Balkan flint source areas, with a potential mediating role for



Fig. 39. Artefacts, Balkan flint blades and formal tools from Rakitovo (1) and Slatina (2)

some nearby settlements in north Bulgaria. Here (once again) the particularity of the Balkan flint variant represented only in Dzhulyunitsa and Karanovo should be stressed (see Gurova et al. 2022b, 18, and above – in section 2.3.2).

It has already been stated that there are only two sites that can be accepted as workshops – Zhernov, on secondary Balkan flint deposits concerned with primary procurement of Balkan flint nodules, with an unclear but envisageable spectrum of activity and distribution (fig. 20) and Slatina, a settlement with an atelier for flint production as household activity (Гацов 1992b;

Николов 1992; Скакун 1992). At Slatina, some of the largest blades of Balkan flint are recorded (see fig. 39.2). Other sites with noticeably large blades potentially suitable for fashioning into formal tools occur at Dzhulyunitsa and Yarlovitsa (Case studies nos 2–3). Unfortunately, research on the Big Slatina house has been completed with no possibility for further work due to the drastic heat impacts on a significant portion of the flint assemblages.

How do the observations on the flint assemblages and the Balkan flint distribution scenarios correspond to the chronological evidence? Let us recall the dates published by R. Krauss for his zone 4 of the regional Neolithic dispersal (Krauss 2023, 242, Table 7):

Azmak (charcoal) – 7303 BP, CalPal (source), 2sigma 6172 cal BC

Karanovo (charcoal) – 7130 BP, CalPal (source), 2sigma 6028.5 cal BC

Slatina (charcoal) – 6970 BP, CalPal (source), 2sigma 5857.5 cal BC

Yabalkovo (bone) – 7040 BP, CalPal (source), 2sigma 5916.5 cal BC

The late dating of Slatina, confirmed by the most recently published dates (Николов, Такорова 2021), is surprising. A date for the Slatina workshop 100–200 years earlier would better fit the processes of supplying and distributing Balkan flint to the site, as well as further redistribution by travelling knappers to the consumer sites along the Struma Valley and across the Upper Thrace to the east. However, there is a lack of concordance between our preferred hypothesis and the archaeological evidence!

Ultimately, the typical characteristics of the assemblages are the presence of representative series of Balkan flint formal tools (most abundant at Azmak, followed by Karanovo and Yabalkovo) as well as their excessive use and transformation. All sites are characterized by opportunistic production, based on other locally and regionally available raw materials used in the debitage production (mainly flakes and fragments). Unsurprisingly, these sites reveal a completely evolved sickle of Karanovo type with remarkably intensively used, resharpened, reversed and reused sickle inserts based mainly on retouched blades, but with a strong element of unretouched blade fragments used for this purpose (figs 17, 21).

To summarize this brief section, I would like to turn to an original "post-processual" interpretation of the Early Neolithic macroblades and their circulation, offered by T. Tsonev: "... the social model of tell settlements also influenced the composition and the raw material distribution of flint assemblages... Thracian tells relied on powerful metaphors that underpin much larger and more distant exchange mechanisms with flint raw materials" (Tsonev 2004, 261).

3.2. EARLY NEOLITHIC SITES IN NORTHERN BULGARIA

I think it is logical to start this paragraph by recalling the scenarios presented by Krauss et al. (2017) regarding Neolithization via the Sub-Mediterranean-Aegean biogeographic zone during the 8.2 ka event. It covers the northern and northwestern edge of the Aegean, including Thessaly, Greek Macedonia and Greek Thrace, and extends further into the Balkans, but only along the valleys of the Vardar (Axios), Struma (Strymon) and Mesta (Nestos) rivers (Krauss et al. 2017, 1). At the end of the first wave of Neolithization, "before moving further to the north along the north-south oriented river systems of the Central Balkans, the Neolithic economy based on agriculture and stockbreeding would first have to be adapted to the relatively harsh winters in the Balkans. Consequently, it would have been possible to apply the new Neolithic lifestyle in the neighbouring areas of Thrace, Wallachia, Dobrudzha, and the Carpathian Basin only after a certain period of adaptation. Available ^{14}C data show that the adaptation period was identical to the time span of the Rapid Climate Change (RCC) event (6550–6050 cal BC) as defined

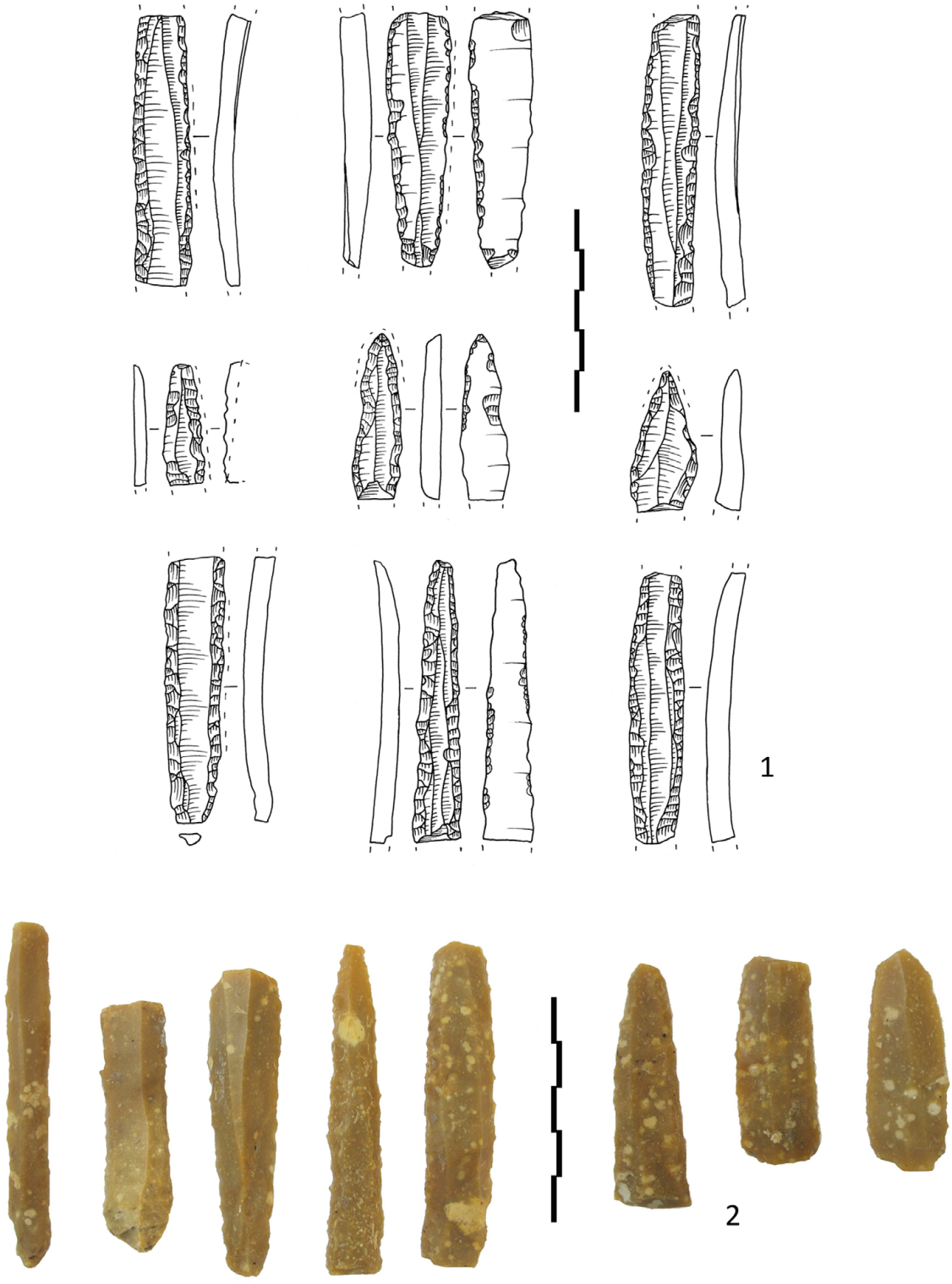


Fig. 40. Balkan flint formal tools from Yabalkovo

in previous studies" (Krauss et al. 2017, 1). As shown on the maps illustrating this dispersal (Krauss et al. 2017, fig. 4; Krauss 2023, 84, fig. 3), the northern areas of this second wave led to the establishment of the Proto-Starčevo complex in the central Balkans and the pre-Karanovo I complex (Dzhulyunitsa/Koprivets) in northern Bulgaria. Krauss places the site of Dzhulyunitsa at the centre of this pre-Karanovo enclave/cluster, affirming that "...the Early Neolithic settle-

ment of Dzhulyunitsa is currently proving to be a key site in determining the characteristics of the earliest Neolithic within the Balkans" (Krauss 2023, 141). This site is of great importance in my quasi-intuitive (in the past) and better argued (now) thoughts and hypotheses about the supply and distribution of Balkan flint as a developed and efficiently functioning raw material network in the Balkans (at least!). Dzhulyunitsa, with sufficient background information, a detailed study, results, comments, and discussion, is presented in Part II as Case study no. 2. In this part, I will share my comments on sites belonging to the same early Neolithization stage, such as Koprivets and Orlovets.

Ovcharovo–Gorata is not included in my comparative perspective because I judged it from different sources with no clear chrono-cultural context for the flint assemblages and a very different approach to its research and interpretation: N. Van Binh's description and instructive drawing in R. Krauss publications (Krauss 2014; 2023) and, on the other hand, the research on the same assemblages by Skakun et al. (Скакун и др. 2018), which do not correspond to my scientific approach either in techno-typological or functional aspects. The impression I gained from these different sources is that the Ovcharovo assemblages resemble those from Late Neolithic Usoe (I)[14] as published by Gatsov and Skakun (Скакун 1994; Gatsov 1990). Both sites are located in Dobrudzha (Ludogorie), with various Lower and Upper Cretaceous flint deposits, and no specific research has been conducted on the raw materials. The observation on the typological repertoire presented suggests that a large proportion of the tools are small endscrapers made on fragmented blades, but mainly on flakes, abrupt truncations and less frequently retouched blades (it is however essential to know from which type of flint they were made – Balkan, Shumen I and II types, or Ludogorie types of flint?!)

The possibility that the Ovcharovo culture could be plausibly established as a 'reneolithization' process by migrating groups from the Karanovo II chrono-cultural background (cf. Todorova, Vajsov 1993, 118–120) seems unlikely based on a comparison of the flint assemblages.

It is worth noting that we are now in the area of Dzhulyunitsa–Koprivets, where the earliest pre-Karanovo Neolithic manifestations are found – both in pottery and flint assemblages.

It sounds strange to articulate it directly, but outside the Karanovo I–II cultural milieu (which is in fact a unique *milieu favourable* for the complete and evolved occurrence of the Early Neolithic formal toolkits) are the sites in northern Bulgaria, some of which have strata denominated as a "monochrome" phase of the Neolithic (a topic inherently related to an ongoing debate which is beyond the scope of the present study). According to the updated version of the ^{14}C database, the following sites in north Bulgaria belong to the Early Neolithic (or possess EN strata) – Ohoden, Dzhulyunitsa, Koprivets, Ovcharovo–Gorata, and Samovodene (lower horizon A) (Marinova, Krauss 2014; Thissen, Reingruber 2017; Kraus 2023). Unfortunately, none of these sites can be shown to be substantially earlier than Karanovo I. There is a remarkable discrepancy in the arguments for the "monochrome" pottery on the sites, and two examples will be listed: Ohoden has been interpreted as belonging to the Proto-Starčevo culture or Western Balkan cultural zone (Ганецовски 2009, 2018); On the other hand, at Dzhulyunitsa, convincing parallels for assemblages from western Anatolia, the Aegean and the Marmara Sea are attested (Еленски 2006; Elenski 2008; Krauss et al. 2014; Kraus 2024), assigning the site to the eastern Balkan cultural zone.

Whatever cultural affiliations can be listed, it is a fact that a cultural group with similar ce-

14 The site appears differently named (Usoe and Usoe I) in various publications, including in those commented on here.

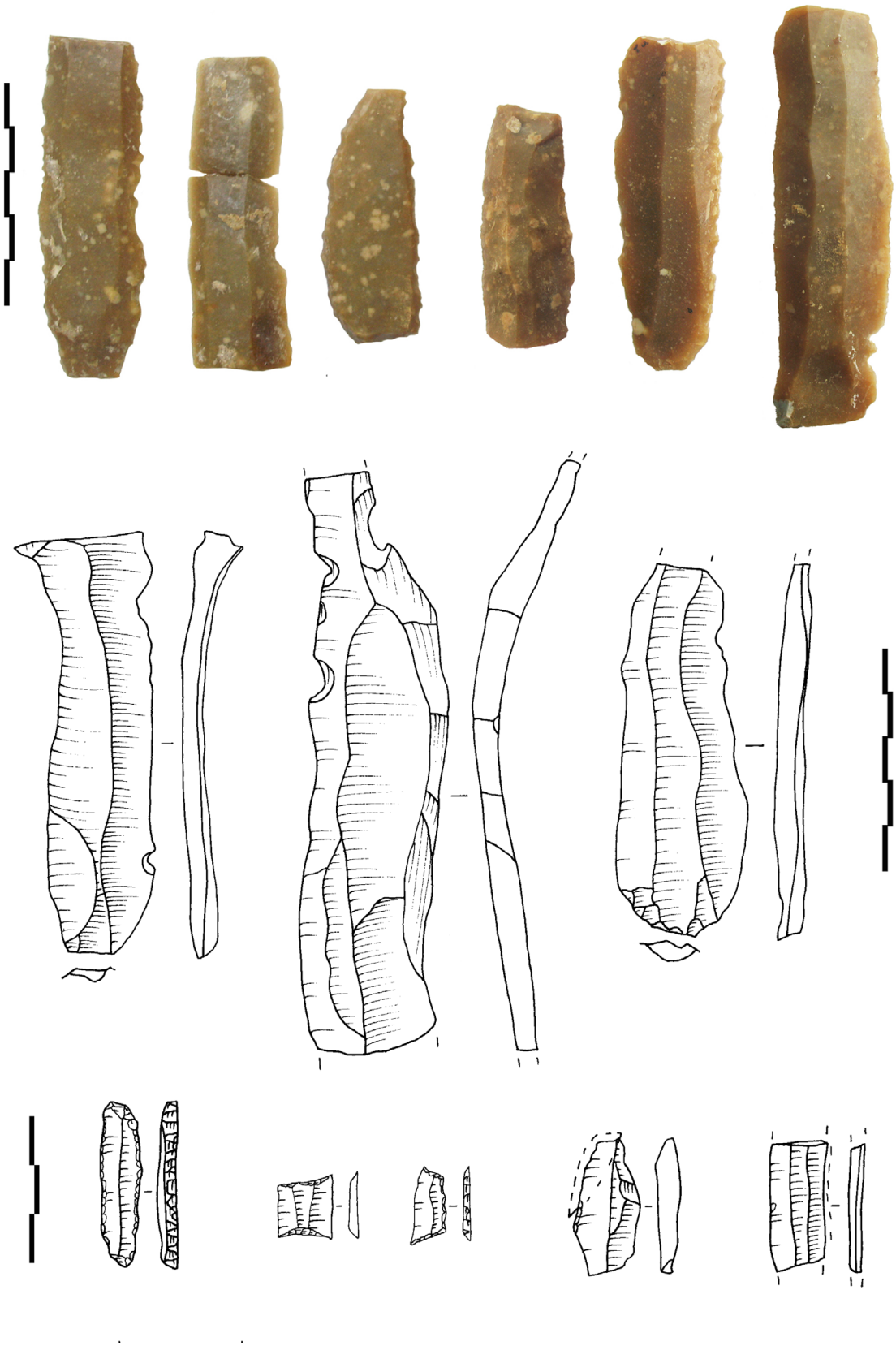


Fig. 41. Dzhulyunitsa: artefacts and Balkan flint tools and blades

ramic features could be established, including the early pottery assemblages from Koprivets, Pomoshtitsa, Orlovets and Polianitsa–Platoto (Krauss et al. ibid., 58). What is known about the flint assemblages from these sites and what cultural affiliations they reveal, and how much the flint assemblages from Ohoden and Dzhulyunitsa differ, based on the substantially different affiliation zone to which they belong?

As a working hypothesis in the past (based on my pilot study), it was tentatively suggested that Dzhulyunitsa acted as a "... potential centre for Balkan flint blank (mainly blade) manufacture and distribution among the settlements in Bulgaria at a pre-Karanovo I phase of the Neolithic (Gurova, Bonsall 2014b, 123)[15]. Actually, the full publication is available in this volume and I can say there are sufficiently serious arguments to sustain, rather than deny my hypothesis (fig. 41). The Case study no. 2 on Dzhulyuinitsa reveals a very intriguing assemblage with an abundance of Balkan flint products and, in a smaller but still representative portion, dark grey white-spotted flint. To recall that this type of flint (visually resembling a dark grey version of Balkan flint, but differing from the beige-greyish colouristic variants of the Balkan flint) is also present in other Early Neolithic assemblages with Balkan flint formal tools, such as Varbitsa, Karanovo and Kovachevo (cf. Gurova et al. 2022b, 23). Despite some resemblance of this flint to raw material from the Kovachevo Formation and Shumen II type, its specific provenance can be considered as still unknown (ibid., 24). The evidence from Dzhulyunitsa indicates on-site knapping and recognizable blade production based on both flint types. The typological spectrum is dominated by retouched blades followed by retouched flakes, endscrapers and splintered pieces; three trapezes are also recorded. Based on the tool repertoire, the Dzhulyunitsa assemblages show sufficiently close parallels with the Ohoden assemblage.

According to the detailed publication of the Ohoden assemblage, there was an *in situ* functioning *chaîne opératoire* based on the supply of local raw materials, as well as evidence of another production using imported cores or blanks. Within 11 distinct types of raw materials, two types theoretically could correspond to Balkan flint: beige-wax to yellow with whitish spots (respectively BG.Oh.F5 and BG.Oh.F6), which are mainly represented by tools and blades and originate from the Razgrad region in Dobrudzha (Zlateva-Uzunova 2009, 72). Flakes dominate the assemblage, but blades (up to 7.5 cm long) are also present. Precisely half of the 60 cores are described as nodules with test flaking. The tool repertoire includes retouched blades, endscrapers, retouched flakes, denticulates, truncations, perforators, and a series of geometric microliths (7 trapezes and two segments) (Zlateva-Uzunova 2009). Examination of a part of the assemblage by the present author confirmed the presence of Balkan flint artefacts within the collection, and this was further demonstrated by analysis of two flint samples from the site (Gurova et al. 2016, fig. 7) (fig. 7.7).

The Early Neolithic assemblage from Gradeshnitsa with prevailing endscrapers and a series of retouched blades (Gatsov 1993, Table 8, Pl. VII–VIII) shows an apparent similarity to the Ohoden assemblage, where the retouched blades are followed by a solid series of endscrapers. The site of Koprivets is commonly characterized as displaying an archaic and amorphous flake-oriented industry with a sparse tool repertoire mainly on flakes, as illustrated by the brief comparative analysis between Koprivets and Ohoden (Zlateva-Uzunova 2009, 74). I. Gatsov pointed out the striking difference between the Koprivets assemblages and those from the Upper Thrace and Sofia plain, both in techno-typological and raw material characteristics. Koprivets is based on multidirectional core exploitation mainly for flakes and irregular blades.

15 This hypothesis was not shared by the paper's co-author C. Bonsall.

Gatsov identified some parallels between this assemblage and the industry from Hoca Çeşme, primarily based on their amorphous character (Gatsov 2009, 121). This conclusion goes in accordance with M. Özdoğan's opinion of similarity in pottery assemblages between both sites, *ergo*, suggesting migration groups' itinerary from Hoca Çeşme northward via Maritsa, Tundzha and Sazlyika River Valleys and through Stara Planina passes to northeastern Bulgaria (Özdoğan 1997; 1999, see also Boyadzhiev 2006, 9 for this Neolithization pathway). It is a case of tracing parallels based on a lack of diagnostic features, i.e., on the amorphous character of the assemblages, which, I think, is less gnoseologically valuable and approvable than to base the analogy on the shared diagnostic features.

T. Tsonev emphasized the same difference compared to Thracian Early Neolithic assemblages. His focus mainly on debitage technology and the number and variety of cores in Koprivets (especially microcores and single-platform cores for small blades) led him to argue for a (virtual!) microlithic aspect of the industry. Looking for parallels, based on features such as the irregularity of blanks and occasional retouch, he drew comparisons with Lepenski Vir I and Romanian assemblages belonging to the Starčevo–Criş complex (Tsonev 2000, 33). Reingruber interprets this fact as a clear indication that Koprivets is comparable to the Mesolithic from Lepenski Vir (Reingruber 2017, 101). This clearly far-fetched assumption (though attractive and convenient!) is based on Tsonev's suggestion that the group of small cores must be connected with microlith (*sensu stricto*) production. We should also consider the uncertainties surrounding the security of the association between the architectural remains and the lithic assemblage assigned to the Lepenski Vir I phase (Borić 1999, 53).

My personal visual impression of the Koprivets assemblage is based on a brief examination of a small number of artefacts after the study done by R. Zlateva. I was impressed by the dominance of flakes, mostly dark grey. A year later, during the field survey for mapping flint outcrops in the Russe region, we located near the site low-quality, silicified Aptian limestones from the Upper Cretaceous Kovachevo geological formation, which appeared to have been used for mass production on the site (Гюрова и др. 2013). It is worth noting that recent fieldwork on the site (Вайсов, Попов 2014) has revealed an abandoned flint assemblage (debitage), indicating a local flint workshop with sporadic visually distinct Balkan flint artefacts.

Small assemblages from the Early Neolithic site of Plochite (near Dzhulyunitsa) and Orlovets were studied by Tsonev and Gurova, and the results were later incorporated in the text published by Станев (2008, 78–80). The Plochite inventory is dominated by flakes, with a small series of exhausted cores, relatively short and not numerous blades and only seven typological tools, most of which are on blades (Gurova 2018b, fig. 7). Tsonev reported two blades with polish (Цонев 2007, 38). On the other hand, use-wear analysis by the present author (MG) identified three sickle inserts (Станев 2008, 80, fig. 69) (Gurova 2018b, fig.7.1 – middle row).

The assemblages from Orlovets (with no clear stratigraphic distinction between early and late phases of the Neolithic) are certainly quite elaborate from a techno-typological perspective. This was emphasized by Tsonev, who pointed out the differences between the expedient flake-based industry of Koprivets and the blade-oriented production (using the punch removal technique) at Orlovets. The blades are regular and medium to large; the tools consist of two endscrapers and a multiple burin on truncation (Цонев 2007, 41–2; Tsonev 2000, 33, fig. 2.2). My interpretation of the tools differs slightly – I would argue for truncated blades instead of endscrapers. Still, the general impression is that the small tool repertoire from Orlovets is noticeably different from other sites belonging to the regional Neolithic (Gurova 2018b, fig.7.2).

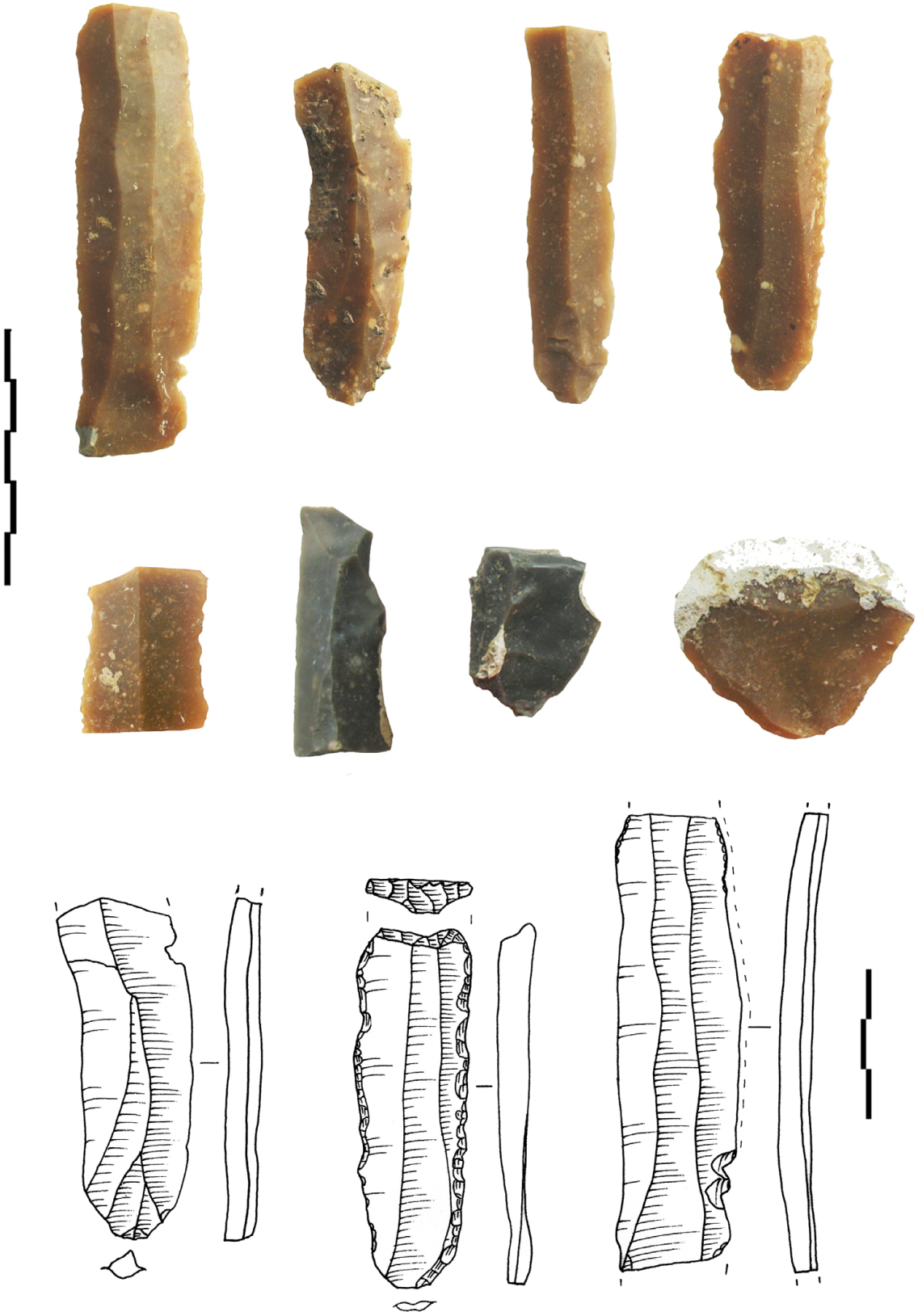


Fig. 42. Varbitsa: artefacts of Balkan flint and dark-grey white-spotted flint



Fig. 43. Yarlovitsa: reused core of Balkan flint (1); Balkan flint blades (2); artefacts (3)

Beyond the cluster with the earliest Neolithic sites, Varbitsa and Yarlovitsa remain; both revealing very interesting flint assemblages, first published here in Part II as Case studies nos 1 & 3.

The Early Neolithic site of Varbitsa (Shumen district) exhibits a thick cultural layer with finer stratigraphic subdivisions. The earliest pottery exhibits an affiliation with early Koprivets. At the same time, the subsequent layers have ceramics belonging to the Ovcharovo culture and could be contemporaneous with Karanovo II and II–III in Thrace (Венелинова и др. 2018). The only published (from a series) date falls to 5799 cal BC[16] (Krauss 2023, 244 Table 7). What should be stressed here is the appearance of Balkan flint formal tools with proven attribution of the raw material to Balkan flint from Pleven–Nikopol cluster (Gurova et al. 2022b, 19) (fig. 42). This site is promising as a missing 'link' between the rare Early Neolithic sites in northeast Bulgaria and the flint assemblages in the southern part of the country, belonging to Karanovo I and II cultures.

The site of Yarlovitsa in northwest Bulgaria surprisingly offers a very rich (dominating) Balkan flint presence in the raw material spectrum. It is the site with the most distinct Balkan flint component (Balkan flint formal tools – retouched blades and sickle inserts) and most evident remains of Balkan flint core exploitation and reuse (fig. 43). The site is attributed to stage II of the Starčevo culture, which gave me more motivation and reason to compare its flint assemblage with what is traditionally and conventionally (BUT should not be axiomatically) considered as a typical Starčevo industry (see the Discussion section in Case study no. 3). The site, located in the northwest corner of the country, became important, at the very least, as a (re)distribution centre of Balkan flint raw materials and by-products. In comparison with Dzhulyunitsa and Varbitsa, the Yarlovitsa assemblage contains many more sickle inserts in the toolkit, indicating agricultural practices and an unexpectedly small number of tools for animal product processing.

To sum up the evidence from the sites in northern Bulgaria: i) apart from the scarce numbers from Varbitsa and even fewer from Dzhulyunitsa, Yarlovitsa and (ultimately Ohoden) the occurrence of Balkan flint formal tools is less well attested among these assemblages in comparison with the assemblages from the Karanovo I–II cultural milieu; ii) there are sites with evidence of a *chaîne opératoire* based on local raw material supply and flake production (Koprivets, Ohoden) and an incomplete *chaîne opératoire* of Balkan flint at Dzhulyunitsa and Yarlovitsa (in the former – accompanied by dark-grey white-spotted flint production); iii) Balkan flint products in general are primarily attested in the Yarlovitsa, Dzhulyunitsa, Varbitsa and, potentially, Ohoden (?) assemblages with the proviso that for Varbitsa Balkan flint and Balkan flint-like artefacts (those made of Shumen I flint) coexist; iv) Balkan flint outcrops *sensu stricto* (Pleven–Nikopol cluster) and *sensu lato* (Shumen I type of flint from Shumen) were nearer to Ohoden and Varbitsa, but Dzhulyunitsa and particularly Yarlovitsa demonstrate an abundance of Balkan flint as a result of regional and superregional distribution (as measured from Nikopol cluster – see Table 2 and fig. 16); iv) as for the subsistence activities, studies at Dzhulyunitsa, Varbitsa and Yarlovitsa have revealed (contrary to my observations in 2018, based on pilot studies of Varbitsa and Dzhulyunitsa) sickle inserts of Balkan flint (i.e. formal tools) which are contextually presented in each of the case studies. Dzhulyunitsa shows a prevalence of implements used in animal product processing; at Varbitsa, the ratio of animal products to cereals is more-or-less equal, whereas at Yarlovitsa, agricultural activity prevails noticeably.

16 ^{14}C Age BP – 6895, bone of ovis/capra, source in the cited book, 2sigma 5799 cal BC.

4. LATE NEOLITHIC ASSEMBLAGES

4.1. GENERAL BACKGROUND NOTES

The Early Neolithic life-ways, including the important role of Balkan flint in subsistence and household activities, as well as in resource distribution networks and the exchange of social messages and symbols, gradually changed in the second half of the 6th millennium BC with the onset of the Late Neolithic. This was part of a general, significant shift in material culture and social organization. There are changes in site location (topography), settlement patterns, building strategy and architecture, as well as in the characteristics of pottery assemblages (Николов 1998; Тодорова, Вайсов 2003; Nikolov 2004). The significance of the different features and multi-faceted progressive changes between the Early and Late Neolithic cultures has led some scholars to distinguish the so-called 'Early' and 'Late Neolithic' cultural blocks with additional subdivisions. In Thrace, a discontinuity between these two blocks is affirmed; the relocation of the population from tells to the plateaus is explained by climatic change with increasing humidity (Тодорова, Вайсов 1993, 125).

The research on the Neolithic in a diachronic perspective in southwest Bulgaria is presented by M. Grębska-Kulow, who identified a well-defined transformation occurring during the Late Neolithic in the Middle Struma Valley. She identified a cultural group with a short time span (the Balgarchevo II–Dolna Ribnitsa ceramic complex) corresponding to the transition between the Early and the Late Neolithic on a regional scale. As for the Late Neolithic, "several new phenomena" are identified with the following features: i) an increase in the number of settlements across the entire region as the new sites are single-layer and short-term; ii) the shift to higher locations and terraces led to considerable change in the size and location of the settlements, some of which became very large (Grębska-Kulow 2017, 260).

On the other hand, a continuous development with smooth transformations in post-Early Neolithic Thrace was proposed by V. Nikolov based on a meticulous analysis of pottery shapes, style and decoration (Николов 1998). The hallmark of the Late Neolithic ceramic complex – black burnished pots – appears in the Karanovo III period, followed by the gradual evolution and increasing spatial distribution of this ceramic style during the successive Late Neolithic periods. This pottery embodies the dichotomy of retaining key features of its Anatolian roots whilst incorporating elements of local diversification and variation, maintained through a continuous process of interaction (Николов 1998, 222).

More recently published is research devoted to a more in-depth examination of the transition from the Early to the Late Neolithic in Upper Thrace (Boyadzhev 2022). The author highlights some significant changes during the Late Neolithic (second half of the 6th millennium cal BC) such as a doubling in the number and character of settlements with different landscape settings (on previously uninhabited large flat terrain, with dispersal plans, "often consisting of dug-in features interpreted in some cases as pit-dwellings and in others as ritual pit complexes" (ibid., 45). Contrasting (semi)subterranean dwellings with the concept of the ritual pit field, the author argues that these sites are long-lasting (not seasonal), typical of, and existing only during the Late Neolithic. Arguments for the transformation are evident in the faunal assemblages, as reflected in the increasing importance of cattle over caprines and the rise of hunting during the Late Neolithic. The most noticeable changes in the pottery are smoother in the northwest part and more abrupt in the western part of Upper Thrace (ibid., 55). The reason for the large-scale transformation processes is looked for in the Holocene climatic fluctuations and unavoidable impact of the series of RCC between 5800 and 5100 cal BC (ibid., 53), the mechanism of

the transformative process is presumed as diffusion (demic or endemic) from an unidentified area, but involving "people with a similar culture, economy, and belief system that quickly and peacefully interacted and mixed with the local ones" (ibid., 55).

Further afield, around the same time (*ca* 5500 BC), all sites in the Iron Gates area are abandoned for more than a millennium. The Starčevo groups were gradually replaced by Middle/Late Vinča groups, characterised by dark-burnished ware, which emerged around 5400 BC. The fully developed agricultural and stock-breeding economy that characterized Vinča ignored riverine resources and established new settlements (Borić 2011, 183).

Similar site abandonments are documented in central-west Anatolia around 5700 cal BC (Çilingiroğlu 2011, 75). Generalizing the changes in the pottery style in the Balkan-Anatolian *koiné* in the second half of the 6th millennium BC, Özdoğan noticed that the black-burnished ceramic (sporadically appearing in Anatolia and the Balkans during the first half of 6th millennium BC) became dominant in the Balkans in the mid-6th millennium (with the stage of Vinča A and Karanovo III) and "reflects all over the Balkans a certain measure of concordance, and local variations in pottery styles can be better defined than in previous periods" (Özdoğan 2017, 24).

4.2. TRANSITION AND TRANSFORMATION IN NEOLITHIC FLINT INDUSTRIES

4.2.1. TECHNO-TYPOLOGICAL CHANGES

As mentioned above, Gatsov (1993) presented evolutionary changes in the Neolithic flint industries from western Bulgaria, highlighting technological degradation during the Late Neolithic. What is important, too, is that endscrapers became the dominant typological group in Late Neolithic assemblages (Gatsov 1993, 51). The endscraper prevalence is best represented in the assemblages from Topolnitsa and Damyanitsa. Further consideration of the transformation of flint assemblages in post-Early Neolithic times was provided by the current author with additional data, new ideas and overviews based on a diachronic comparative analysis of flint assemblages from many different types of Neolithic settlements (Gurova 2002a–b; 2004a; 2005b; 2010; 2011a; 2014b; 2017a–b; 2018b; 2023).

In general, the argument for a significant transformation is supported by: i) the increasing role of local raw materials (expedient industry) and limited demand for Balkan flint, *ergo* – a decline of the Balkan flint distribution system; ii) a decrease in ordinary blade production (in number and dimension of the blades) and consistent prevalence of flake debitage with subsequent transformation into tools on flakes (mainly endscrapers, followed by retouched flakes); iii) an increased diversity of endscrapers both in typological and morphometric parameters, but with noticeable reduction in length and increasing shape variation; iv) evident microlithization, represented by small and microcores for blades (bladelets) and two categories of retouched artefact: very small (micro)endscrapers on flakes (typically semicircular in shape) and geometric microliths *sensu stricto* (trapezes, crescents/segments and rare atypical shapes); v) persistence of rare but recognizable Balkan flint formal tools, representing a retardation/reminiscent element of the flint industry. All these features are well illustrated at the site of Harmanli (see fig. 44).

Only two tell sites (Karanovo and Kapitan Dimitrievo) offer the possibility of studying flint assemblages in a direct diachronic perspective across different environmental settings. During the Early Neolithic Karanovo I–II periods at the eponymous tell site, a clear orientation toward the production of medium to big blades ('macroblades') from Balkan flint occurs, which were subsequently transformed into diagnostic formal tools with evidence (in some cases) of multi-

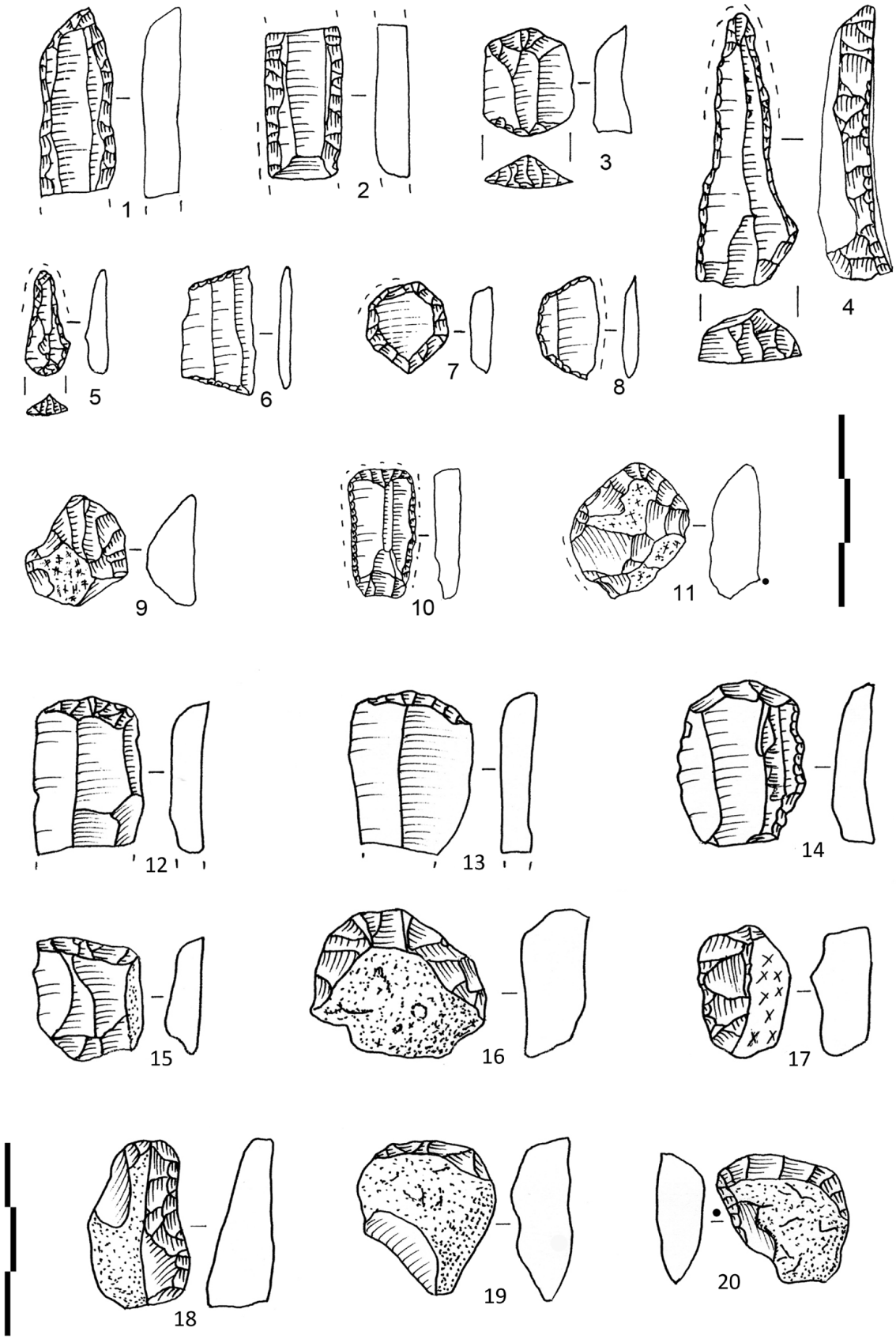


Fig. 44. Late Neolithic site of Harmanli – typological tools

ple rejuvenation. It is unclear where precisely the manufacture of formal tools took place – on site or in specialized workshops. In the Late Neolithic, sporadically in Karanovo III and mainly in the Karanovo III–IV and IV periods, changes occurred in the technology and morphometric parameters of the lithics; medium to big blades decrease in number, some tendency towards microlithization occurred, attested by the appearance of small cores for blades (bladelets) and three geometric microliths (2 trapezes in Karanovo III–IV and a segment in Karanovo IV) (fig. 45). Typological 'evolution' is expressed in the progressive decrease of formal tools, which survived as reminiscent forms until the Karanovo III–IV period. In contrast, there was a progressive increase in the frequency of endscrapers, which appeared during the Karanovo IV period and reached their developed stage in the later Chalcolithic Karanovo V and VI periods (Gurova 2002a, 2004b, 2005b). These developments in the flint assemblages (which are conservative rather than very flexible and easily changeable) are smooth and gradual. In this respect, they are in accordance with the gradual but smooth transformative changes in the pottery style (Николов 1998 – *vide supra).*

The assemblages from Tell Kapitan Dimitrievo are interesting because they reveal the recognition of a particular final phase of the Late Neolithic. My observations regarding the typological spectrum (which is not abundant or rich) allowed me to conclude that the development of Kapitan Dimitrievo shows closer affiliations, both diachronically and typologically, with the materials from Thrace rather than with the western Bulgarian model of Neolithic development, marked by perceptible technological degradation (Гюрова 2001, 40).

The aforementioned changes are evident in all Late Neolithic flint assemblages to varying degrees, due to the differing settlement patterns and social structures that existed at the time. The changes are smooth with clear evidence for continuity in the characteristic traits between the Early and Late Neolithic assemblages on tell sites, where the continuity of life is inherent and coherent *per se*. In contrast, among strictly Late Neolithic assemblages from flat or 'thin layer' newly established settlements, the industry can be mixed. Still, it is dominated by the Late Neolithic diagnostic features as described above. In the second category are the flint assemblages from sites such as Balgarchevo[17], Apriltsi, Ezero[18], Sarnevo, Harmanli, Sozopol, Tash Bair, Usoe, and Brankovtsi, with the most important examples presented briefly below.

The site of Apriltsi is located in western Thrace, northwest of Kapitan Dimitrievo. The site time span starts with Karanovo III and continues with a gradual transformation into Karanovo IV. According to the excavator, it belongs to an ethno-cultural group that "settled into the area at the time of the transition between the Early and Late Neolithic (Boyadzhiev, Slavchev 2011, 38). The settlement patterns suggest this is the earliest settlement in Thrace with semi-subterranean dwellings (ibid., 37). The flint assemblage is very scarce – 7 artefacts, some of which, fortunately, have diagnostic features (Terziiska-Ignatova, Gurova 2011). Five of the artefacts are made of Balkan flint, and three of them (at least) represent Balkan flint formal tools diagnostic for the Early Neolithic assemblages (fig. 46.1–3). These artefacts do not reveal any of the features diagnostic of the Late Neolithic industry. Their incorporation into the functioning of the Late Neolithic settlement can be explained by their import from the areas surrounding

17 The site of Balgarchevo is important for demonstrating the transformation between Early and Late Neolithic in the Middle Struma valley *(vide supra).* The small assemblage studied by the author was not stratigraphically distinct, which diminishes its significance. Further precision of the artefacts' context (in publication) will hopefully reinforce my preliminary observations which were presented in the previous paragraph 3.1.1.

18 The small assemblage from Dryanovo Tell (Dryanova mogila) near Ezero is briefly presented in Сотиров и др. (2010) and presented here with a small series of geometric microliths.

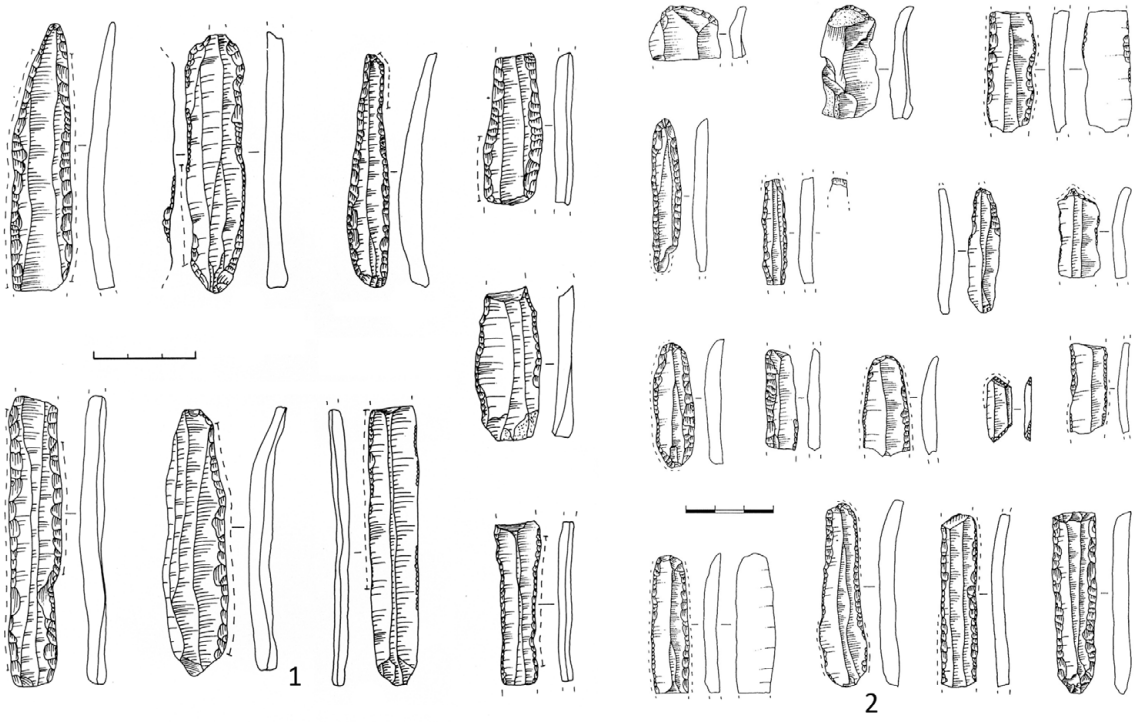


Fig. 45. Tell Karanovo artefacts from: Karanovo periods II and II–III (1); period III–IV (2)

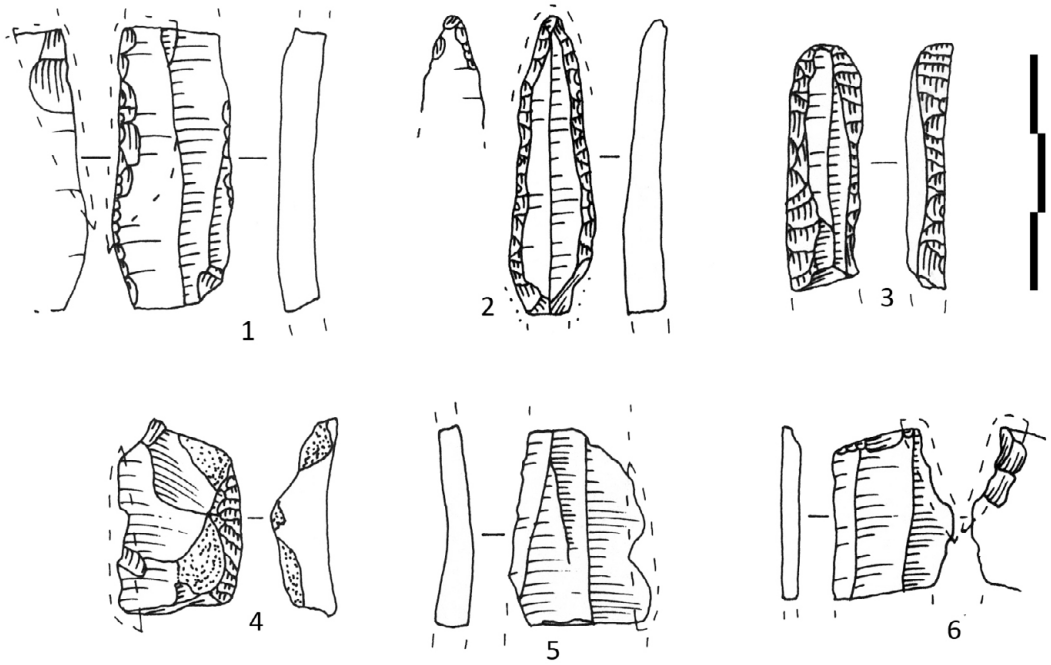


Fig. 46. Artefacts from the Late Neolithic site of Apriltsi

Early Neolithic sites, such as Kapitan Dimitrievo and Rakitovo. The statement that the changes between the Early and Late Neolithic in the western part of Thrace are 'more abrupt' cannot be confirmed by the case study of the Apriltsi flint assemblage.

The site of Sarnevo, interpreted as a "pit-field", was part of a recently published large-scale rescue excavation (Bacvarov et al. 2017), where a prehistoric stratum belonging to the Karanovo III–IV period in Thrace was uncovered. The flint assemblages were studied and published by the author (Gurova 2017a). My assessment of the assemblages is based on a detailed study and subsequent comparative analysis, yielding very intriguing observations. Due to the site's unique character ("pit-field") and the intriguing repertoire of flint assemblages, an updated version is presented here as Case study no. 7 in Part II. In general, endscrapers prevail (most of them with Late Neolithic characteristics) (*vide supra*), followed by retouched blades and flakes, and there are 15 geometric microliths. Within the tool repertoire there is, however, clear evidence of Early Neolithic formal tools (fig. 47). Their occurrence within the particular "pit-field" structure could refer to a documented but unexcavated Early Neolithic tell nearby, from where these attractive artefacts could have been taken and reused by the creators and consumers of the ritual practices that were performed at Sarnevo according to the discoverers (Bacvarov et al. 2017, 237).

The site of Harmanli belongs to the Karanovo IV period (Бъчваров и др. 2005; Bacvarov et al. 2010) and has a rich flint assemblage (more than 1400 pieces) that is very important for characterizing the Late Neolithic flint industry (Gurova 2010) (fig. 44). This is the reason why the assemblage is presented here as Case study no 6 in Part II. The typological repertoire exhibits well-defined characteristics of a Late Neolithic assemblage, including the prevalence of small endscrapers (including those on flakes), a high frequency of retouched blades, and three geometric microliths: a trapeze, a crescent, and a pentagonal tool. Several artefacts of the Early Neolithic formal tool category are present. Their presence, given the existence of an Early Neolithic layer on the site, could be interpreted as the reuse of formal tools found in the surroundings.

Interesting case studies of the Late Neolithic industry relate to two sites on the south Black Sea coast – Budzhaka (Sozopol) and Akladi Cheiri (Chernomorets), approximately 10 km apart. The first is not published, but in 2023, during a small-scale rescue excavation in Sozopol (on the borders of the Ancient Apolonia Acropolis complex), redeposited remains of the Late Neolithic site (supposedly from the Budzhaka site) were found (Панайотова, Девлова 2024). The flint assemblage (61 artefacts) was provided to me for study. Apart from dominating debitage products (27 flakes, 7 blades and 11 fragments), 8 typological tools and 2 small bladelet cores are recorded. The poor repertoire includes small endscrapers on flakes (4), a splintered piece, a combined tool – endscraper/truncation, a retouched flake and a backed tool (unfinished segment?) (fig. 48.1). Among the raw materials macroscopically recognized yellow and greyish versions of Balkan flint are recorded, as well as the dark grey white spotted flint with uncertain provenance and a flint variety with unknown origin (fig. 48.2).

Northwest of Sozopol, near Chernomorets, is the multilayered site of Akladi Cheiri, which reveals structures (mainly pits) from the Late Neolithic, Chalcolithic, and EBA periods (Leshtakov et al. 2020). Very rich flint assemblages are found, and fortunately, they have been published (Zlateva-Uzunova 2020). Noticeable are the diagnostic features of the late Neolithic industry: striking dominance of small endscrapers (294 – most on flakes), small size cores on "concretions" (presumably small nodules – MG) for bladelets and flakes and respresentative series of geometric microliths variety (two trapezes, three triangles and 24 segments) (Zlateva-Uzunova



Fig. 47. Late Neolithic site of Sarnevo: Balkan flint artefacts and formal tools (1) and geometric microliths (2)

2020, 126–127; Table 8, fig. 2). Just a general notes on Black Sea chipped-stone assemblages – one of the standard features for them in a broader chronological time span (from Dikilitash to the Early Bronze Age site of Ropotmo) is the fact that small size flint (or fine crystalline rocks) nodules are usually knapped using the splintered technique (see, for ex. Dimitrov et al. 2024).

A site of interest in many respects is Tell Provadia, the first inhabitants of which have been identified as originating from Thrace, bearing cultural features characteristic of the Late Neolithic Karanovo III–IV period (Николов 2009). Particularly intriguing is how the flint assemblages of this migrating population changed after adapting to the new environmental and cul-

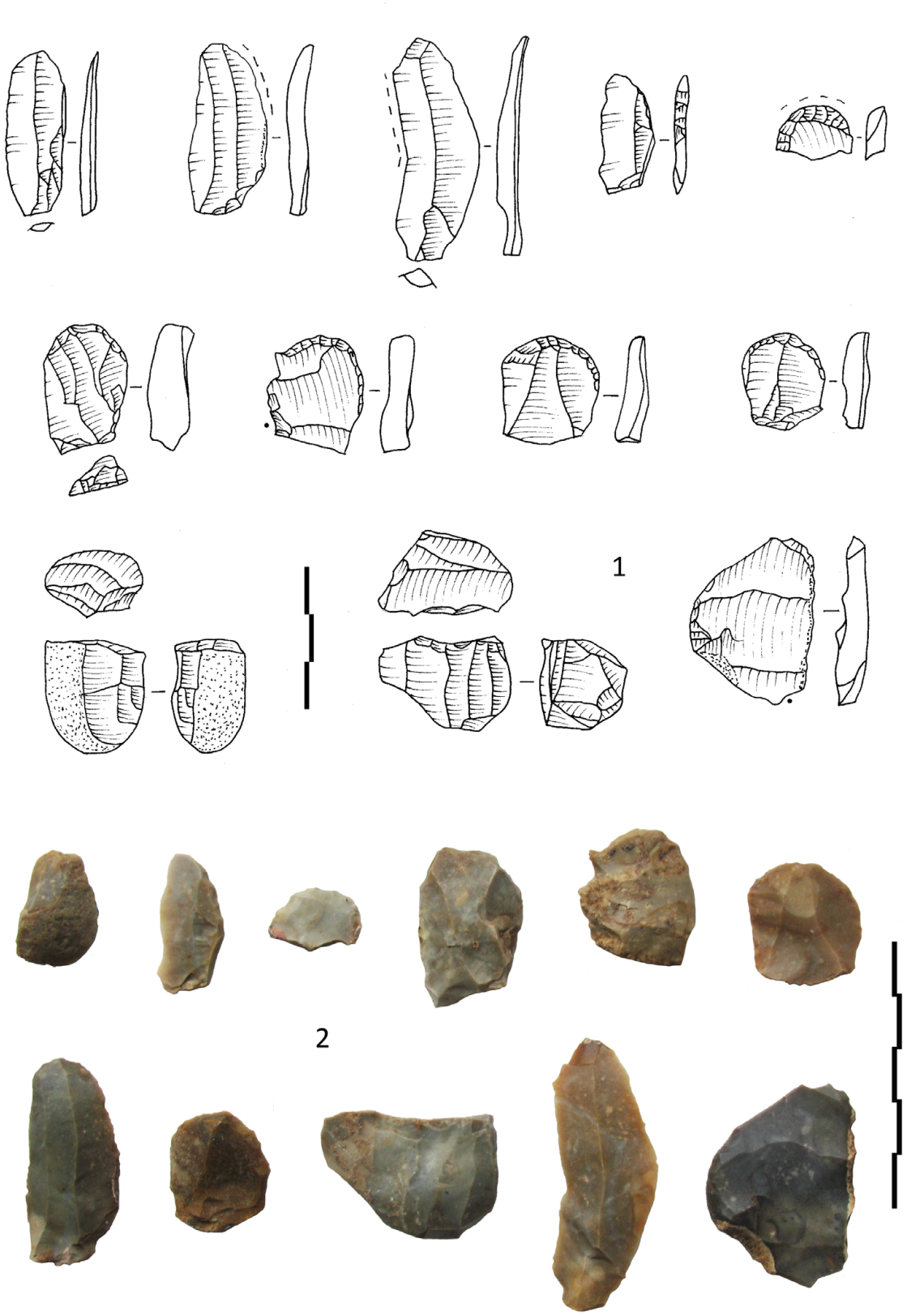


Fig. 48. Sozopol: artefacts (1) and raw material variety (2)

tural conditions. The question remains open because only two assemblages (from the central trench and dwelling 4) have been published. Flake-based production is attested by the presence of flake cores and small cores used for blades and bladelets. Tools are limited in number, with a small repertoire that consists of endscrapers on shortened blades and retouched blades (Анастасова 2009a–b). A further diachronic and comparative analysis of flint assemblages from the Late Neolithic and Chalcolithic layers of the tell will undoubtedly contribute to the problem of continuity and adaptation of the Late Neolithic lifestyle. Another aspect of interest is the discovery of 4 sickles (with antler handles and partially preserved flint elements). This intriguing 'sickle hoard' was presented and compared with the well-preserved sickles from Tell Karanovo in a previous publication (Gurova 2016a) and will be discussed further below.

The Usoe site should be highlighted as a typical example of a Late Neolithic flint assemblage north of the Balkan Mountains. The assemblage was studied and published by both Gatsov and Skakun (Скакун 1994; Gatsov 1990). The site is considered part of the Vinča-type cultural complex. It could be synchronous with Kaloyanovets (Karanovo IV) in Thrace (Тодорова, Вайсов 1993, 98, табл. 10). The flint assemblage is very large (more than 20,000 artefacts) with a marked prevalence of flakes and a rich repertoire of endscrapers (including regular, fan-like and semicircular forms), which are the predominant typological category (representing more than half of all tools). In addition, there are retouched blades and flakes, perforators/borers, notches and several geometric microliths. The particular features of this assemblage, along with the striking dominance of endscrapers, prompted Tsonev to conduct a special study that included assemblages from north-central Bulgaria. In this study, Tsonev noted the similarity between the Usoe assemblage and the Late Neolithic stratum at Kachitsa (Цонев 2007, 65).

It is worth noting the Late Neolithic assemblage from the culturally multi-sequenced microregion of Tash Bair (near the village of Novgrad, Ruse district). The last collaborative investigation in the region (which dates back to 1959) resulted in a Bulgarian-German research project with extensive surveys in 2018 and 2019, followed by trench excavations in 2019 and a complete publication of this fruitful collaboration (Vagalinski et al. 2023). A long chronocultural sequence is recorded in different *loci* of the research area, spanning from the Late Neolithic to the Early Medieval Ages. The flint assemblages were provided to me for study and were published (Gurova 2023). The flint collection comprises two main components: assemblages from surveys and those from excavations, with a noticeable quantitative predominance of prospection artefacts (1171) over those from excavations (255). Relevant to the concrete case is the assemblage from Site 1 (identified and documented during the surveys), the artefacts from which can be attributed to the Late Neolithic. The typological repertoire reveals a dominance of endscrapers on flakes (32), followed by retouched blades (21) and 10 more tool categories with a small number of pieces each (ibid., 442) (fig. 49.1, 3). A similar prevalence of endscrapers on flakes is recorded among the assemblages from the trench excavations (fig. 49.2). As for the raw materials – macroscopically recognizable are Ludogorie flints (Ravno and Kriva reka varieties), black low-quality flint from Aptian limestone sequence, Balkan flint with its yellow, and beige-greyish white spotted variants and some unknown infrequent flints (ibid., 434–435, for the flint varieties see Andreeva et al. 2014; Gurova et al. 2025) (fig. 49.3). It is noteworthy that the Ludogorie flint types are not recorded among the Late Neolithic assemblages – but are found among artefacts of morphometric and typological features of the Chalcolithic industry.

The last site to be mentioned here – Brankovtsi – is located in the northwestern part of the country, near the Early Neolithic site of Yarlovitsa. There are several reasons I have chosen to present it as Case study no. 8 in Part II: i) the closeness to Yarlovitsa offers the opportunity for

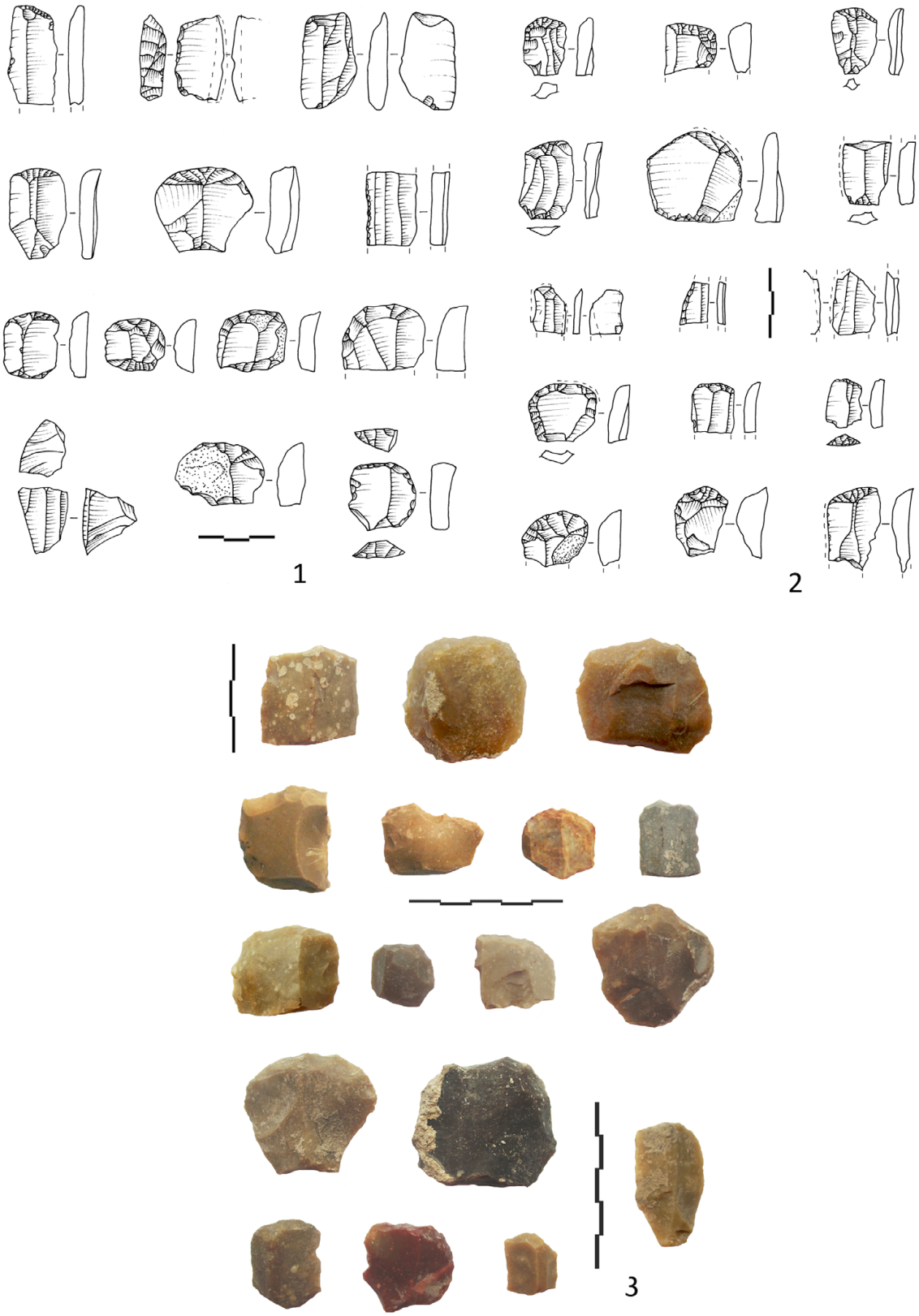


Fig. 49. Late Neolithic assemblages from Tash Bair: from the surveys (1, 3); from the excavations (2)



Fig. 50. Late Neolithic site of Brankovtsi: raw material variety (1) and artefacts (2)

an instructive multifaceted comparative analysis in a diachronic perspective (*vide infra* in the next section); ii) the site possesses detailed spatial records of all finds, which is a rare case in our archaeological practice; iii) the site has ^{14}C dates, *ergo* – does not rely on relative chronology; iii) the site (as Yarlovitsa) offers an opportunity to confront Balkan flint (as long-distance import material) and its by-products (blades and tools) to the debitage and rare tools made of local flint from the deposits of the West Balkan Carbonate Group (see Gurova et al. 2021b). The site reveals an interesting typological repertoire, characterised by small endscrapers on flakes, which dominate the small number of tools (fig. 50).

As far as the geometric microliths *sensu stricto* are concerned, they appear in different Late Neolithic contexts as follows: Tell settlements – Karanovo (Gurova 2002a; 2005b), Drama–Gerena (Lichardus et al. 2000); multilayered pit site Acladi Cheiri (Zlateva-Uzunova 2020); flat sites – Harmanli (Gurova 2010), Usoe (Скакун 1994; cemetery – Durankulak (Hamangia culture phases I–II) (Gurova 2002b; Sirakov 2002), and the so-called pit field/complexes – Sarnevo (Gurova 2017a–b); Lyubimets–Dana bunar 2 (Анастасова 2012; Anastassova 2009) and Hadzhidimitrovo (Петрова и др. 2024). The Late Neolithic microliths are the most numerous and typologically variable among all Holocene geometric microliths from Bulgaria; however, trapezes predominate (fig. 51). Late Neolithic assemblages with microliths are intrinsic to the radical changes in material culture that occurred after 5500 BC. The microlithization of the flint industry is just one aspect of this transition. Thus, they could be considered one of the peculiar and even diagnostic features of the transformation of the Late Neolithic flint industry. Microlithization is a phenomenon provoked either by an adaptive strategy to altered environmental circumstances, by the establishment of new communities with different ancestral traditions and latent technological and craft apprenticeships, or by a combination of factors. Thus, they could be considered one of the peculiar and even diagnostic features of the transformation of the Late Neolithic flint industry. More details about geometric microliths from the Neolithic period, presented in their comparative and diachronic perspectives, are provided in Gurova (2017a). There is, however, a consideration that should be taken seriously in the context of the Holocene manifestation of geometric microliths. Although they are most numerous in Late Neolithic assemblages, their temporal and spatial distribution is erratic, which cannot be overlooked. Still, it is a fact that this random presence/absence can only be partially attributed to the excavation techniques (some of which did not permit the recovery of microliths).

4.2.2. CHANGES IN RAW MATERIAL SUPPLY AND USE

Apart from the techno-typological split of the flint industry, another question that requires further investigation concerns the shift in the procurement and distribution of raw material (notably Balkan flint), which occurred at the beginning of the second half of the 6th millennium BC. After playing a fundamentally important role in the Neolithization process and having a wide distribution in the Early Neolithic of Southeast Europe, Balkan flint use and significance declined after the Early Neolithic, most likely during the Karanovo III or III–IV period (Gurova 2011b).

Regarding the apparent and gradual decrease in Balkan flint circulation and use during the Late Neolithic, several interpretive trajectories are related to broader cultural changes, including the contentious issue of demographic growth. This is presumed for the Struma Valley region (Grębska-Kulow 2017), but the abandonment of multilayered sites in northern Bulgaria also occurs (Reingruber 2017, 107). So, there should be no natural constraint on access to Balkan flint sources in the Late Neolithic. Still, it seems that the profound transformation in settlement

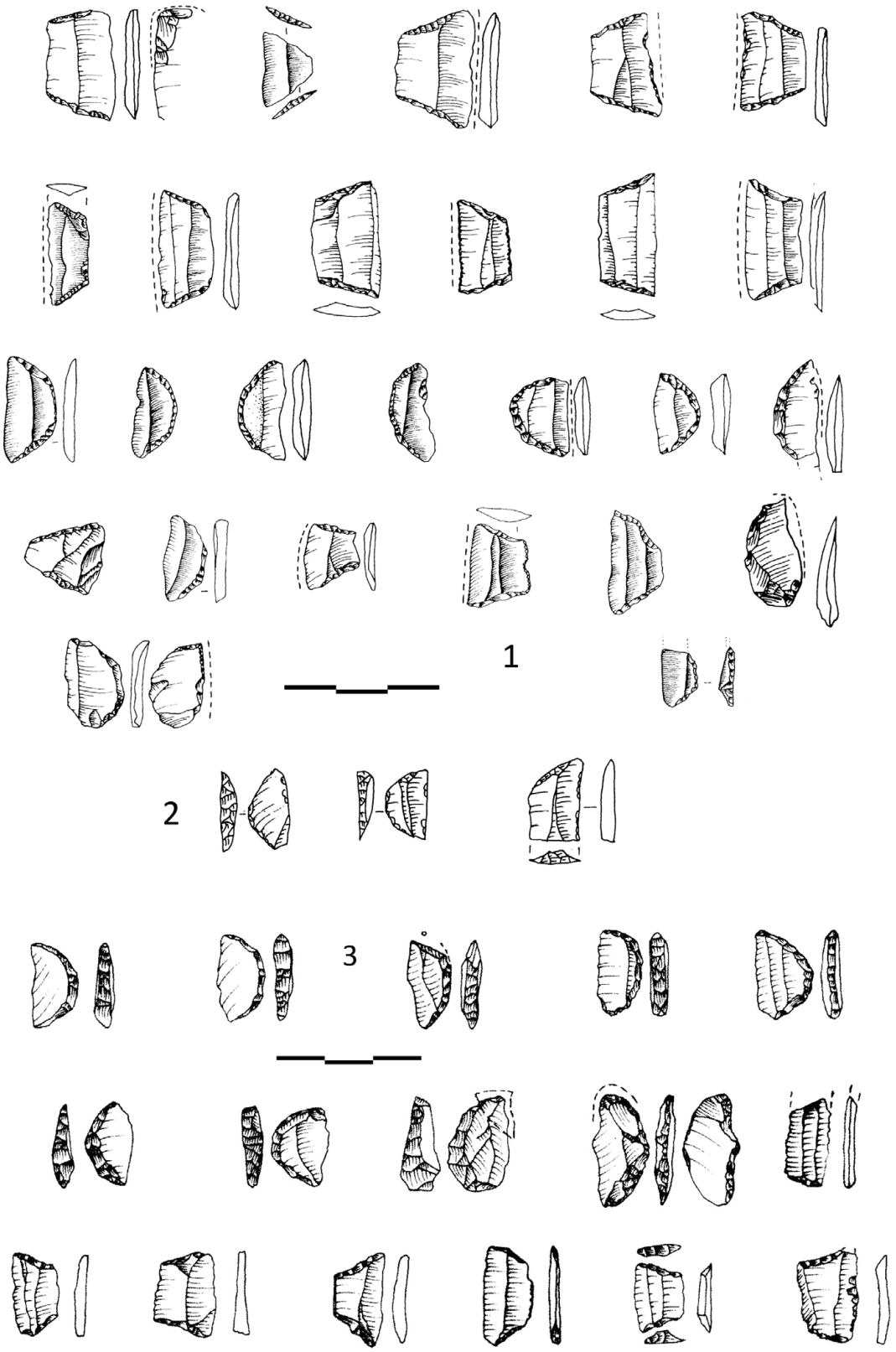


Fig. 51. Late Neolithic geometric microliths from: 1. Drama-Gerena (rearranged/adapted from Lichardus et al. 2000, 4); 2. Ezero (Dryanova mogila) (drawings by M. Gurova); 3. Lyubimets–Dana bunar 2 (rearranged after Anastassova 2012, 21, fig. 2) (reproduced fig. 3 from Gurova 2017b)

patterns and social structures led to a new decision-making strategy and to the degradation/abandonment of traditional networks – first the Balkan flint one, but also the long-distance import (random but existing in the Early Neolithic) of obsidian artefacts.

Most Late Neolithic flint assemblages show variability in the raw materials used for debitage and tool production. The raw materials are mainly local, coming from secondary placer deposits of siliceous rocks. The needs of the numerous Neolithic sites in Upper Thrace were met by easily accessible raw materials within the Maritsa River catchment (containing alluvial-colluvial sediments), rich in re-deposited materials from Palaeogenic flint rock masses that are widely distributed in the Plovdiv district and the Eastern Rhodopes. More information on the Early *vs* Late Neolithic raw materials will be presented in the following sections.

PART II – CASE STUDIES

INTRODUCTION

The overview presented in Part I is based on a synthesis of more than forty Neolithic sites – which differ in several aspects: i) the type and duration of investigation – prospections, regular excavations, or rescue excavations; ii) the character of the stratigraphic sequence – multilayer (tells) *vs* single-layer (flat) sites; iii) settlements *vs* so-called pit-fields/sites; iv) the chrono-cultural background – Early Neolithic and Late Neolithic sites. My intention was to combine examples of the various 'types' of sites to compare their particularities and common features. Taking into consideration various arguments, characteristics, and site patterns, I have attempted to create a balanced, if not optimal, site sampling (fig. 52). An additional, but important argument in case study selection lies in the fact that some emblematic sites were studied and published long ago, when the conceptual, interpretative and technical meanings of the research were different. Last, but not least from the point of view of the raw material/Balkan flint perspective is the focus on the sites in north Bulgaria and those belonging to the beginning of the Neolithic sequence – the strategic placement of Varbitsa, Dzhulyunitsa, and Yarlovitsa is ideal because their locations in the northeastern, central, and northwestern sectors of the regional Neolithic *oikoumene*, respectively, provide an excellent basis for a broad comparative analysis of regional cultural trends and developments.

The Struma River Valley, as the most likely corridor for the first Neolithic migration groups, is represented by the site of Ilindentsi, which postdates Kovachevo but is sufficiently close to it and with similar regional characteristics. The Thracian Early Neolithic (Karanovo I–II) periods in the famous eponymous Tell and the broadly accepted chrono-cultural complex of the Karanovo I and II cultures are shown by the representative selective assemblage from the Yabalkovo site. Late Neolithic sites are presented by three examples: a typical site of the Karanovo IV period in Thrace – the site of Harmanli; one example from the fully published pit-field/site of Sarnevo, belonging to the Karanovo III–IV period, closer to Karanovo Tell; and finally, the recently discovered site of Brankovtsi in northwestern Bulgaria, closer to the Early Neolithic site of Yarlovitsa and offering an opportunity to compare diachronically both sites in raw material and typological perspectives.

Three of the sites used as case studies are already published: Yabalkovo, Harmanli and Sarnevo (Gurova 2010; 2014a; 2017a). However, their inclusion among the case studies is unavoidable, and all three include essential updates. The other case studies represent the first publication of the results of my research there, and I hope their interpretation and inclusion in the vital Neolithization debate will be instructive.

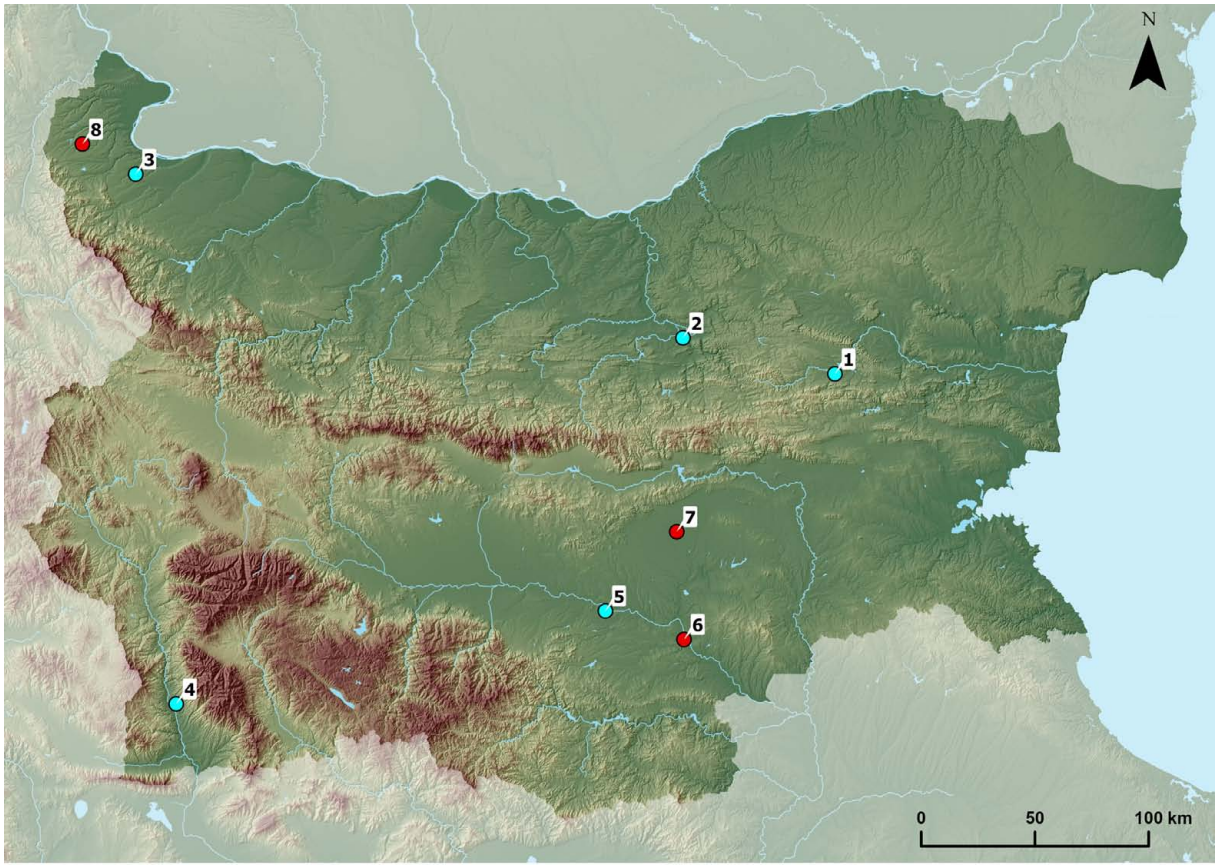


Fig. 52. Map of Bulgaria with locations of the sites presented as case studies: 1. Varbitsa; 2. Dzhulyunitsa; 3. Yarlovitsa; 4. Ilindentsi; 5. Yabalkovo; 6. Harmanli; 7. Sarnevo; 8. Brankovtsi. ***Legend:*** *cyan circle – Early Neolithic; red circle – Late Neolithic (figure by N. Kecheva)*

1. EARLY NEOLITHIC

1.1. CASE STUDY NO. 1: FLINT ASSEMBLAGE FROM VARBITSA

Introduction

Excavations at the Varbitsa site, conducted in two small surface trenches over two seasons (2015 and 2017), revealed an impressive array of finds. These allowed the excavators to perform comparative analyses with contemporaneous sites in north-central and northeastern Bulgaria and Thrace, focusing exclusively on ceramic production and pottery (Венелинова, Григоров 2017, 2019). The site is intriguing and important for its representative Neolithic sequence, including the Karanovo I to Karanovo III cultures, according to V. Nikolov's periodization (Николов 1998; Nikolov 2004, 14–17; 2017). The ^{14}C dates for the entire sequence corroborate the periodization of the cultural and stratigraphic strata presented by the excavators[1]. Therefore, Varbitsa cannot be overlooked as an important point in the debate on Neolithization, both regionally and supra-regionally. A significant contribution to the general representation of the site is offered by the analysis of its flint assemblage, which is still available in the form of short reports in the series Archaeological Discoveries and Excavations (Венелинова и др. 2018; Григоров и др. 2016) and as mentioned in specialized archaeometric studies on the flint raw material in north Bulgaria (Gurova et al. 2022a–b).

The flint assemblage comprises 108 artefacts, most of which have individual identification numbers. Contextually, the following grouping of the artefacts can be made:

- from the surface – 20 ex.;
- from trench 2 – 9 ex.;
- from trench 1 – 79 ex.

The general structure of the assemblage in terms of the techno-typological differentiation is presented in Table 4.

Table 4

Context	Tools	Blades	Flakes	Fragments	Cores	Total
Surface	9	6	1	3	1	**20**
Trench 2	1	1	6	1		**9**
Trench 1	22	19	24	14		**79**
Layers I–III/ *K III*	12	10	15	8		45
Layers IV–VI/ *K II-III*	4	3	3	1		11
Layers VII–X/ *K II*	4	4	2	2		12
Layers XI–XV/ *K I*	2	2	4	3		11
Total	**32**	**26**	**31**	**18**	**1**	**108**

Table 4. General structure of the assemblage by techno-typological categories and context

1 Until now, only one date (5799 cal BC) from the earliest layer has been published by R. Krauss and is mentioned here in Part I, section 1 (Krauss 2023, 238, Table 5).

The stratigraphic layers distinguished by the excavators are referred to the Neolithic cultures in northeastern Bulgaria and then to the conventional updated version of the Karanovo chrono-cultural periodization (Николов 1998, Nikolov 2004, *vide supra*). Such contextual incorporation at regional and supra-regional scales is reasonable and beneficial, allowing deeper and broader comparative analysis of the material culture features, and, thus, more reliable interpretative discourse and issues.

The assemblage is analysed and presented through the lens of: i) available raw materials; ii) techno-typological characteristics of the artefacts; iii) functional connotation, based on the use-wear analysis of selected samples.

My study suggests there are no significant differences within the flints assemblages of the presented Neolithic sequence in any of the gnoseological aspects of the research – no evidence and arguments for intra-cultural differentiation are recorded. The assemblage as a whole reveals features characteristic of the Early Neolithic flint industry (including the transition to the Late Neolithic?). Still, it does not contain any diagnostic features of the Late Neolithic industries that would be theoretically expected in the Karanovo II–III layers, particularly in the Karanovo III period. On the other hand, there is a small series of unstratified (and *a posteriori* intrusive) artefacts with unambiguously Chalcolithic parameters which cannot be related to any known context in the site vicinity. Taking into consideration the aforementioned reasoning, the assemblage is presented not according to the layers listed in Table 1, but rather in two general groups: artefacts without context and artefacts from explored and distinct layers, with a focus on their specific and diagnostic features in raw material, morpho-technological, and typological aspects.

Raw materials: characteristics and procurement strategies (figs 53–56)

The assemblage contains two primary and macroscopically recognizable groups of flint: Ludogorie flint (Ravno type) (figs 53.A1–2; 55) and flint visually identical or very similar to the Balkan flint provenanced to north-central Bulgaria (Gurova 2012a; Gurova et al. 2016) (figs 53.A4–5, B3–4; 54). As usual in all studied Early Neolithic sites, typical Balkan flint (yellow-brownish-beige with white spots) appears alongside its grey variant (grey to dark grey white-spotted flint) (Gurova et al. 2022b, figs 3–4) (figs 53, 56). There are artefacts of flint with an unidentified but supposed local origin.

Until recently, the publication of C. Nachev (2009) was the primary source of systematized and practically useful information on the geological aspects of flint, which is frequently found in prehistoric and protohistoric chipped-stone assemblages. This work is based on personal research and previous extensive studies by the geologist I. Nachev and the archaeologist K. Kanchev.

C. Nachev argues that the first Neolithic migrant communities in northeastern Bulgaria came from the west along the Danube and subsequently started to use and distribute high-quality Ludogorie flints within Neolithic communities (Начев 2009, 11–12).

The second major type of flint in north Bulgaria, termed “Moesian” by C. Nachev, has several principal outcrop clusters: Vratsa–Montana, Pleven–Nikopol and Shumen–Provadia. Due to its poorer knapping (mechanical) properties, the Moesian flint attained a more restricted distribution – as a local raw material (Начев 2009, 14).

As mentioned in Part I, my research into the role and importance of flint as a raw material and its derivative assemblages in the Neolithization process led to systematic, intensive, long-lasting, multidisciplinary and innovative research on Balkan flint. The provenance, supply

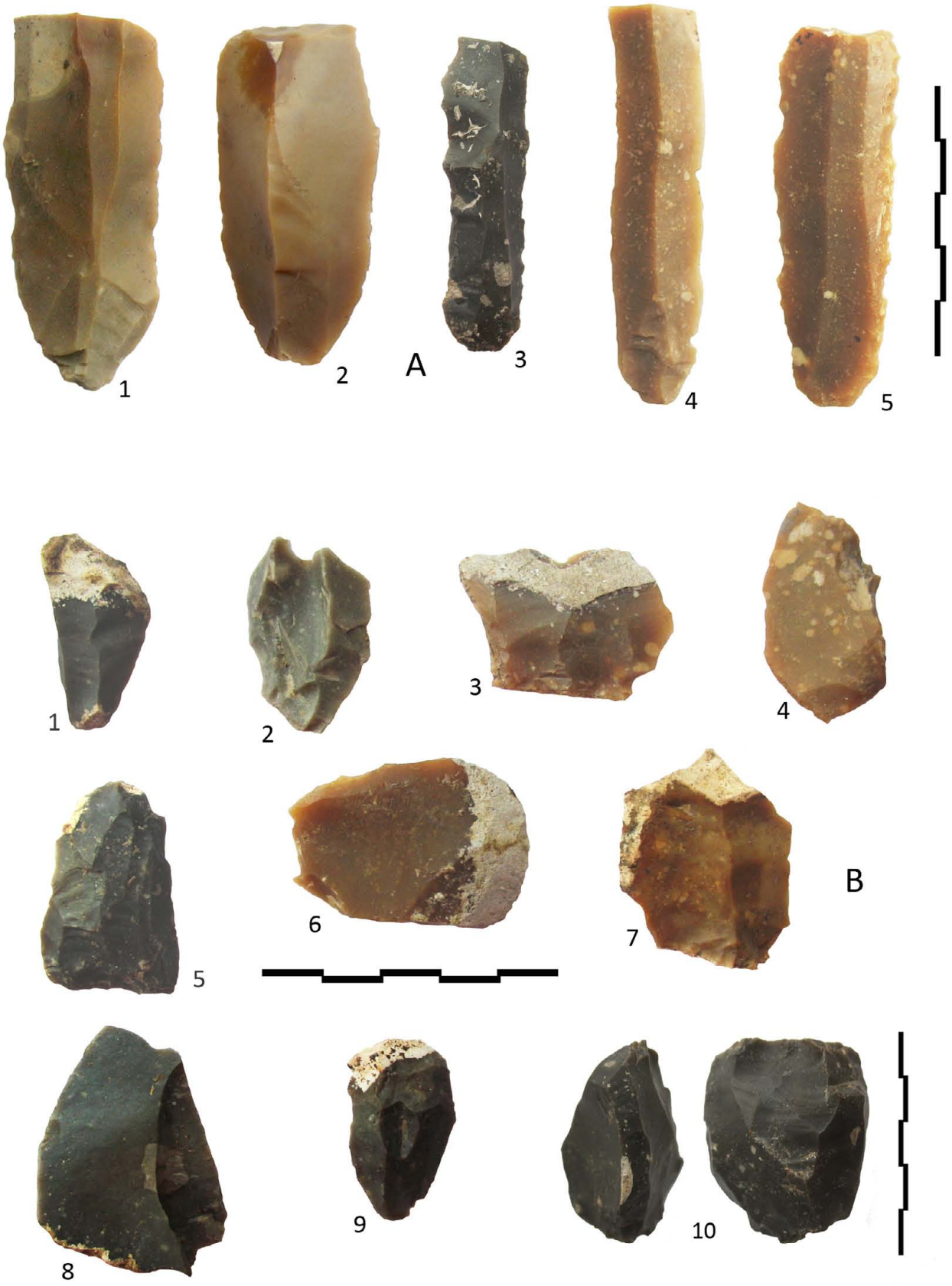


Fig. 53. Visual appearance of the raw materials represented in the assemblage: A – blades and typological tools; B – flakes (1–9) and a core (10). Contextual data (containing layer): A: 1 – surface; 2 – layer VIII; 3 – I; 4 – surface; 5 – Trench 2; B: 1–4 – layers IX–XV; 5–9 – IIA–C; 10 – surface

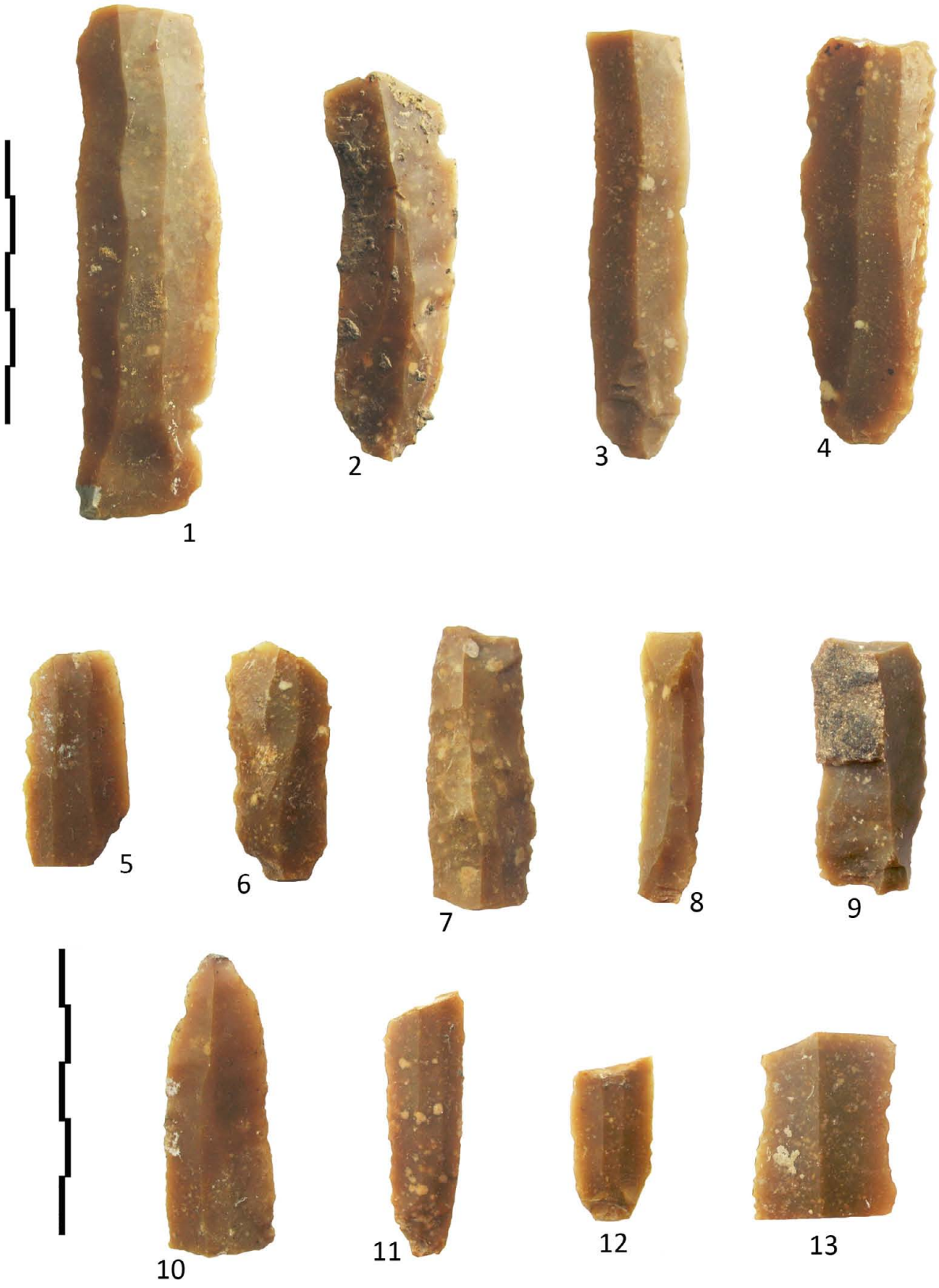


Fig. 54. Flint artefacts macroscopically resembling Balkan flint (with contextual data): 1 – IV; 2 – VI; 3 – surface; 4 – Trench 2; 5 – IIA; 6 – IIIA; 7 – X; 8 – I; 9 – I; 10 – XII; 11 – VIIB; 12 – VIIA; 13 – VIIB



Fig. 55. Artefacts of Ludogorie flint, Ravno type (with contextual data), last two artefacts are affected by heat alteration: 1 – surface; 2 – VIII; 3 – I; 4 – XIV; 5 – 17/I; 6 – surface; 7 – VI; 8 – surface; 9 – I

and distribution of Balkan flint became the focus of our team's research programme, with Varbitsa flint samples representing an integral and important part of it (Gurova et al. 2016; 2021b; 2022a–b). The Varbitsa flint assemblage is also important because it contains tools closely resembling the typical formal tools of Balkan flint. The latter can be unequivocally defined as the hallmark of Early Neolithic industries in Bulgaria, particularly those included in the Karanovo I–II cultural *koiné*. Furthermore, formal tools and artefacts made from Balkan flint are distributed across a vast territory in the central and eastern Balkans and the Carpathian Basin during the Early Neolithic, thus tracing the network distribution of Balkan flint (Gurova 2008a; 2009; 2011a; 2012a–b; 2018b; Gurova, Bonsall 2014a).

The systematic field surveys, followed by the implementation of a new analytical procedure combining micropetrography with geochemical (LA-ICP-MS) analysis of raw material samples and flint artefacts, enabled the reliable identification of flint outcrops and their relationship to the archaeological samples.

Our first survey in north-central Bulgaria was the most productive, yielding detailed documentation and the identification of clusters of Balkan flint outcrops in the Pleven–Nikopol region. The most securely identified outcrops occur in chalky limestones of the Upper Cretaceous Mezdra siliceous-carbonate Formation (Gurova et al. 2016). Analyses of the raw material sam-



Fig. 56. Artefacts analysed for raw material identification (with contextual data): 1 – XII; 2 –IIA; 3 – XII; 4 – VI; 5 – IIA; 6 – II; 7 – V; 8 – VI

ples revealed a correlation with most visually recognizable Balkan flint from the assemblages at all investigated Early Neolithic sites (Gurova et al. 2022b). Apart from the Pleven–Nikopol outcrop cluster, there was a challenging situation in the Shumen district: the Early Neolithic strata of Varbitsa site produced artefacts similar to Balkan flint formal tools. An additional motivation for conducting a survey here was Nachev's observation that there are Moesian flint outcrops southeast of the massive Ludogorie flint cluster, and the fact that the Shumen region has been considered a potential provenance area for pre-Balkan Platform flint (Voytek 1987). We identified two new types of flint (Shumen I and II). Visually, Shumen I closely resembles Balkan flint, but geological and LA-ICP-MS analyses showed they had different petrographic and geochemical profiles (Gurova et al. 2022a). Thus, the Shumen–Provadia cluster (following C. Nachev) is represented by at least two different flint types, and Shumen I (with its subtype defined by the sample from Panayot Volov village) is macroscopically very similar to the typical Balkan flint. In contrast, the raw materials of the Shumen II type consist mainly of grey flints, and the variant of the Markovo village sample resembles the grey version of Balkan flint (see Gurova et al. 2022a, 24, fig. 6).

How can the Varbitsa assemblage be integrated into the Balkan flint research? The samples

from the site have been analysed twice – once in the context of the regional investigation in Shumen district, and later in the context of the large-scale comparative research of a collection of artefacts from Neolithic (predominantly Early Neolithic) flint assemblages from 10 archaeological sites and their comparison with the samples of all the flint outcrops visited in north Bulgaria (except the Ludogorie flints). In the first case, one artefact (macroscopically identical to Balkan flint and one dark grey white-spotted artefact were analysed and respectively attributed to the Shumen I type (the Balkan flint-like one) and to the Shumen II type (the grey artefacts) (Gurova et al. 2022a, 24, fig. 7.1a–b; 30, fig. 12) (fig. 56.1–2).

In the second case, six artefacts were analysed – four visually similar to Balkan flint and two dark grey white-spotted (Gurova et al. 2022b, 3, fig. 3.3) (fig. 56.3–8). Intriguing results were obtained: the artefacts macroscopically similar to Balkan flint correlated with the Balkan flint raw material and its outcrops, to which the majority of analysed archaeological samples from all over the country belong (ibid., 18); as for the two grey artefacts, they show some similarity with flints of the Shumen II type, but also with samples from the Kovachevo Formation (Gurova et al. 2022b, 15, 20, fig. 11.3). GIS modelling of distribution pathways suggests procurement of local and meso-local sources (up to 40–50 km from the settlement) – i.e. Shumen cluster outcrops. On the other hand, the supply of Balkan flint from the outcrops of the Nikopol cluster suggests a procurement strategy based on supra-regional/ long-distance raw material distribution (170–180 km) (ibid., 22, Table 2, 23, fig. 15).

The outcrops of Ravno-type flint in Ludogorie are located at *ca* 100 km, which is feasible within a regional distribution network. However, the question of the true context of the Ludogorie flint artefacts from the Varbitsa' Neolithic sequence remains unresolved. Also still open is the question of the presence of Ludogorie flint of Kriva reka type within the Varbitsa assemblage. It was not identified macroscopically among the artefacts. Still, laboratory analyses are required for a reliable discrimination of this type of flint among the available series of artefacts of unknown origin.

Techno-typological analysis

The structure of the assemblage, as presented in Table 1, shows a significant number of typological tools (n=32), more than any other artefact category. However, the debitage products combined (n=75) prevail and comprise 69% of the entire assemblage.

The techno-typological descriptions and analyses are based on the following classification/ differentiation:

- typological tools (n=32);
- debitage products (n=75) consisting of:
    a) blades (fragments included) (n=26);
    b) flakes (only entire pieces) (n=31);
    c) fragments (n=18) – distinguished as flake fragments (pieces with morphological parameters suggesting fragmented flakes, but without butts or proximal parts), and indeterminate fragments/chunks (in some studies, such pieces are termed debris).
- core (n=1).

As mentioned above, the assemblage will be presented in two parts: unstratified artefacts, followed by those recovered from secure contexts in the excavated trenches.

The tools' repertoire in the entire assemblage is presented in Table 5.

Table 5

Tool category	With context	Without context	Total
Retouched blades	11	5	**16**
Retouched flakes		1	**1**
Endscrapers on blades	2		**2**
Endscrapers on flakes		1	**1**
Truncated blades	7	2	**9**
Splintered pieces	1		**1**
Perforators/ borers	2		**2**
Total	**23**	**9**	**32**

Table 5. Tool categories by artefacts' context

1. Artefacts without context

These artefacts, collected mainly from the surface, number 20 items: nine typological tools, six blades, one flake, three fragments, and the only core in the assemblage. Among the artefacts are some with diagnostic features of the Neolithic flint industry, as well as artefacts corresponding to the Chalcolithic raw material preference, knapping traditions and typological repertoire.

Typological tools (n=9), consisting of five retouched blades (four with bilateral retouch and one with unilateral retouch – fig. 58.6); two truncated blades; one endscraper (figs 55.8; 58.3) and one retouched flake. Two of the tools (the endscraper and a retouched blade) are of the Ravno type of flint (fig. 55.6, 8), while two retouched blades and one truncated blade are made of Balkan flint, indicating an Early Neolithic origin (fig. 58.6).

Debitage products (n=75), including:

- blades (n=6) are represented by two proximal and four medial fragments; the ratio of trapezoidal to triangular sections is 5:1. Both preserved butts are flat, ovoid and compact, and suggest the punch technique of removal. Dimensions vary as follows: length – from 2.1 to 7.1 cm; width – from 1.1 to 2.8 cm, and thickness – from 0.3 to 1.1 cm. Two of the most representative blades in the assemblage are the proximal fragments that possess diagnostic features. One is of a large blade with an appearance typical of a Chalcolithic blade, a product of specialized domestic blade production using the punch technique (figs 53.A1; 55.1; 58.5). The second blade shows affiliation to an Early Neolithic industry in terms of the raw material (Balkan flint) and common morphometric parameters (figs 53.A4; 58.4);

- the flake is in the category up to 4 cm and represents a rejuvenation piece of the core removal surface. The raw material is a dark grey, white-spotted flint, frequent within the debitage products;

- all three fragments are indeterminate, one being smaller than 1.5 cm.

The core is for blades and flakes with changed orientation of flaking (multiple cores) of dark grey white-spotted flint (a grey version of the Balkan flint ?). No direct refitting with debitage products of the same raw material is feasible (fig. 53.B10).

2. Artefacts with stratigraphic position

This portion of the assemblage includes the artefacts from both trenches revealing stratigraphically determined layers. Only nine artefacts were recovered in trench 2; they belong to mechanical layers IV–VI, which the excavators attributed to the middle phase of the Neolithic sequence. The structure of this assemblage is as follows:

- typological tools (n=23);
- debitage products (n=65) consisting of:
    a) blades (n=20);
    b) flakes (n=30);
    c) fragments (n=15).

The typological repertoire comprises 11 retouched blades (seven with bi- and four with unilateral retouch); seven truncated blades; two endscrapers; two borers, and one splintered piece. The retouched blades are prevalent, a common feature of the Early Neolithic industry. The high steep retouch, diagnostic of the formal tools of the Karanovo I–II cultural milieu, is rare; most frequent are discontinuous marginal retouches, rarely alternating (figs 57.3; 59.4–5, 7). Micro-scarring and utilization retouches are also recorded (fig. 57.1, 4). One of the tools, with ventral semi-steep retouch, is made of Ravno-type flint (*vide infra;* fig. 55.7). Among four distal truncations, two typical Early Neolithic diagnostic tools are present – with steep lateral retouch and distal truncations (figs 57.8; 59.6). There are two double truncations (figs 58.2; 59.2) and one on the proximal part (fig. 57.5). The endscrapers and one of the borers possess a typical Chalcolithic appearance (fig. 55.2–4) (*vide infra*). The second borer is the only tool made of dark grey white-spotted flint, the tip being fashioned in the bulb area (fig. 57.6). The splinter is unifacial and bipolar.

It is noteworthy that there are typological tools diagnostic of different chrono-cultural contexts and flint industries. Four of the six tools made of Ravno-type of flint can be attributed to the Chalcolithic tradition: a large blade with unilateral retouch from layer VI (fig. 55.7); two endscrapers on large blades from layer I (fig. 55.3) and layer VIII (figs 55.2; 58.8), respectively; and an atypical borer (with ventral covering retouch in the distal part) from layer XIV (figs 55.4; 59.9). Two remaining tools of Ludogorie flint (retouched and truncated blades) are from the mixed layer I. To the formal toolkit of the Early Neolithic industry can be attributed some of the retouched and truncated blades, made of visually Balkan flint (-like) materials. Some of them were used as sickle inserts (figs 54.3–7; 57.3, 8; 59.2, 4–6). They appear in layers IIA to XII with no noticeable concentration in any layer. This symbiotic coexistence of artefacts with different contextual attributions is intriguing. One explanation could be that the Chalcolithic artefacts from the surface (belonging to some undetermined local Chalcolithic occupation) were subjected to a mechanical intrusion into the stratified layers in the trenches.

The debitage products include:

- blades (n=20), of which eight are proximal, eight mesial, and two distal fragments, and two complete pieces. The ratio of trapezoidal to triangular sections is 15:5. All preserved butts are flat and compact, indicating punch percussion technique. Dimensions vary as follows: length – from 2.8 to 8.8 cm, width – from 1.0 to 2.5 cm, and thickness – from 0.3 to 1.0 cm (figs 57.2, 7, 9; 59.1, 3). In terms of raw materials, the visually recognizable Balkan flint (-like) prevails (fig. 54.1–2, 8–9, 12–13); single pieces are made of dark grey white-spotted flint (treated by us as grey version of Balkan flint) (fig. 53.A3). There are two blades of Ravno-type flint – two from layer I and one from layer III (fig. 58.1). One blade has traces of substantial heat impact (fig.

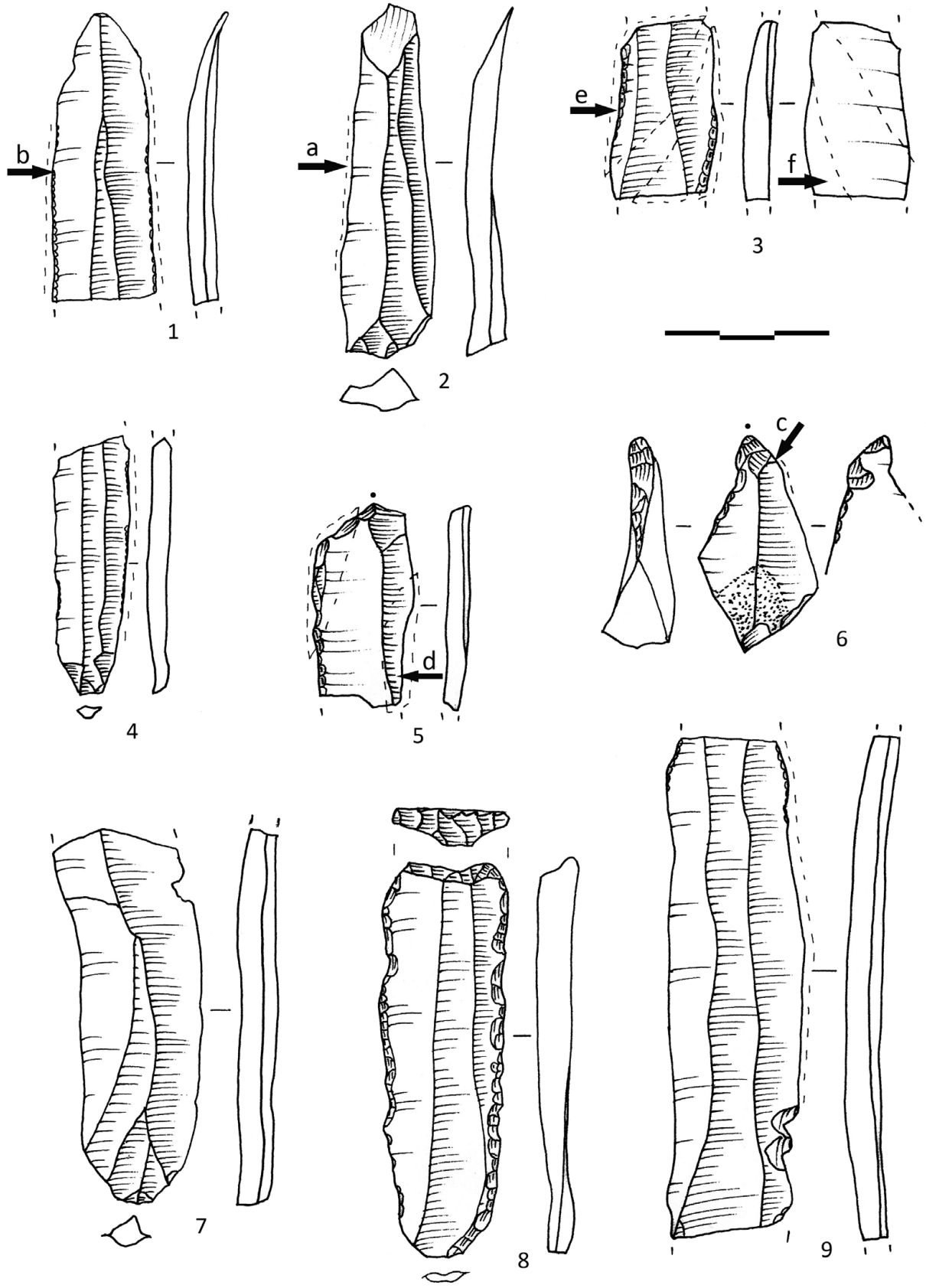


Fig. 57. Blades (2, 7, 9) and typological tools (1, 3–6, 8). Used edges are marked by dashed lines; the arrows show photomicrographs in fig. 60. Contextual data: 1 – XII; 2 – XIII; 3 – V; 4 – VIIB; 5 – IIC; 6 – VI; 7 – VI; 8 – Trench 2; 9 – VI

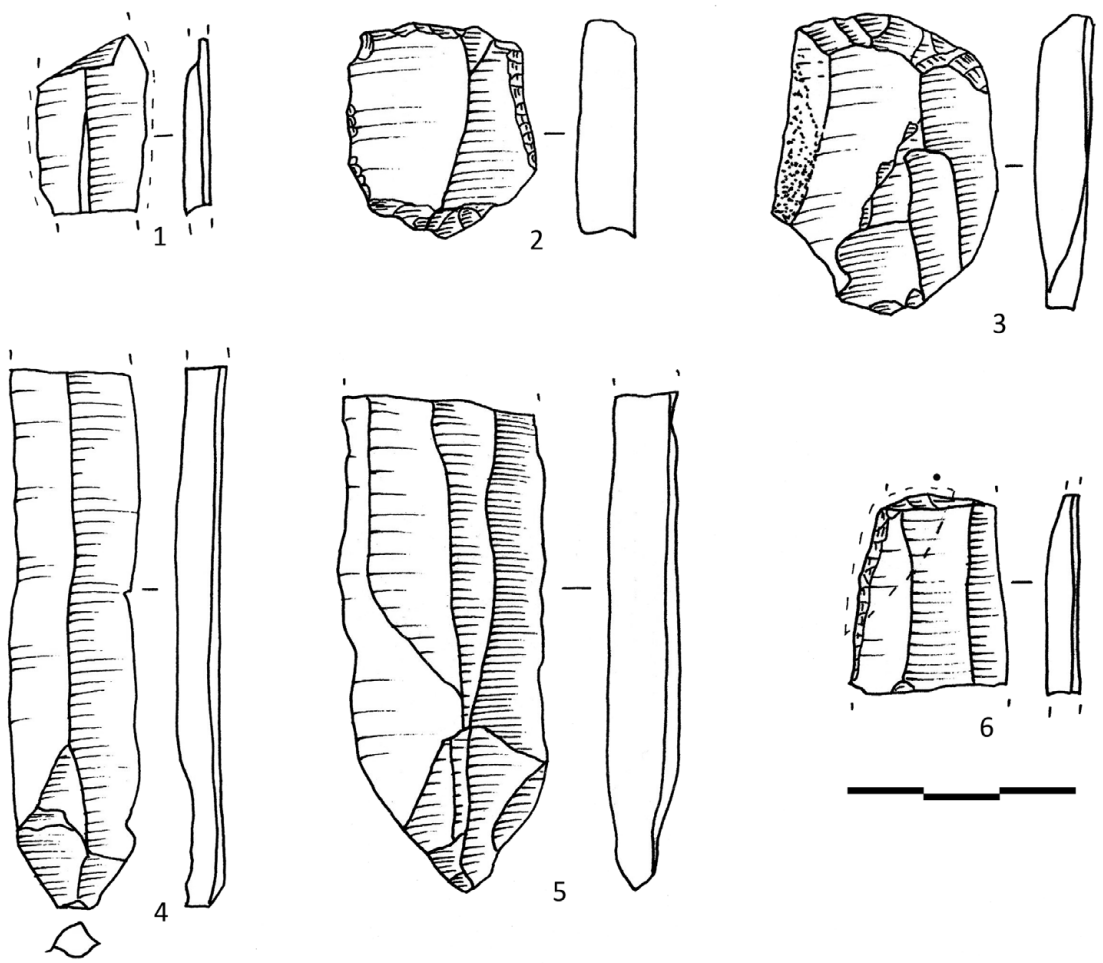


Fig. 58. Blades (1, 4–5) and typological tools (2–3, 6). Used edges are marked by dashed lines. Contextual data: 1 – I; 2 – I; 3–6 – surface

55.9). Among the blades, there is one crested piece and no cortical piece. It should be stressed that Balkan flint blades are present from the earliest layers of the site, and some of them have impressive dimensions (fig. 54.1–4). The largest blade came from layer IV and represents an ideal blank for fashioning a typical Balkan flint formal tool (figs 54.1; 57.9). This blade has several recent negative findings/damage in the proximal part and micro-pedollization in the distal part. The butts of the blades indicate indirect percussion as the primary removal technique. Small blades and bladelets, which could be affiliated with a microlithization that appears in the Late Neolithic, are virtually absent, with one exception – a mesial blade fragment with dimensions of 3 x 1 x 0.3 cm, which was found in layer IIA, but it is still an isolated case;

- flakes (n=30) are noticeably heterogeneous in colour and dimensions. Very few pieces exceed 4 cm in length. There are two massive flakes from Trench 2, and both are cortical. Eight more flakes preserve cortical remains on their surfaces, suggesting their involvement in core production and initial exploitation. All flakes were removed from single-platform cores by direct percussion (fig. 53.B). Among the flakes, the dark grey, white-spotted flint is more frequent than in other artefact categories. There are only 2 ex. of Ravno-type flint; one (from layer I) is a massive burin spall, while the second is a Janus flake from Trench 2;

- fragments (n=15) include seven flake fragments and eight indeterminate items, of which three could be classified as chips (with dimensions < 1.5 cm).

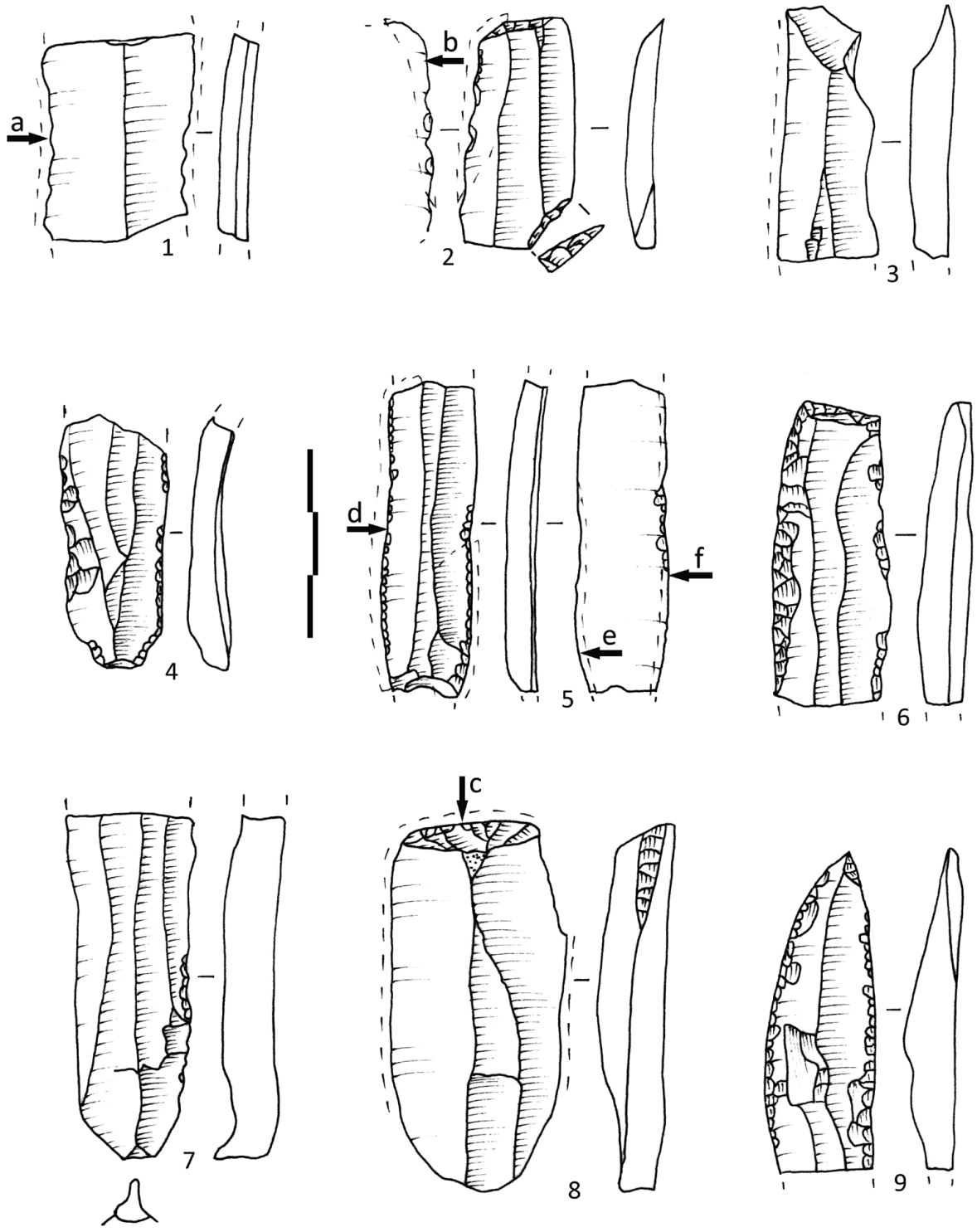


Fig. 59. Blades (1, 3) and typological tools (2, 4–9). Used edges are marked by dashed lines; the arrows show photomicrographs in fig. 61. Contextual data: 1 – VIIB; 2 – IIA; 3 – XII; 4 –IIIA; 5 – X; 6 – 150/X; 7 – IIIA; 8 – VIII; 9 – XIV

Functional connotations

A representative sample of artefacts was subjected to use-wear analysis: 28 typological tools, 18 blades and 10 flakes. The selection was based on preliminary macroscopic observations of artefact preservation, surfaces, and edges, and on morphometric parameters that suggested and/or excluded possible use. The functional interpretation is based on a complex of macro- and microstigmata of utilization because the micro-scarring can result from both utilization and taphonomic/pedolization impact. In cases where undeniable use-wear traces were revealed, they are considered as such even if they might not be indicative of the worked material. The primary purpose was to detect and record secure traces of use, indicating various subsistence and household activities of the village community, rather than to draw a general palaeoeconomic profile listing numerous activities with detailed functional determinations and proportions between them. Research of the latter kind presupposes a different approach, requiring exhaustive analysis of the archaeological complexes/assemblages. Furthermore, such research usually involves a different approach to use-wear analysis and interpreting the results obtained (cf. Скакун и др. 2016; 2018).

The traceological observations were conducted using an MBS 10 stereomicroscope (x100) and a Keyence VHX-100 digital microscope (with a magnification range from x25 to x150). The latter was used for the photomicrographs.

The results of the traceological analysis are presented in Table 6.

Table 6

Used artefacts	Cereals	Plants	Meat/hide	Hide	Bone/ antler	Indeterm.	Total
Debitage							***12***
Blades	2		2	1	2	4	11
Flakes		1					1
Tools							***14***
Endscrapers				1			1
Truncations	3			1			4
Retouched blades x1				3			3
Retouched blades x2	2		1	1		1	5
Borer – relict traces		1					1
Total	**7**	**2**	**3**	**7**	**2**	**5**	**26**

Table 6. Distribution of used artefacts according to the worked material (numbers in italics refer to tools made of Balkan flint)

The results (despite their incompleteness) suggest a low prevalence of activities related to the treatment of animal products. A similar trend is observed at other north Bulgarian sites, such as Dzhulyunitsa (Case study no. 2), whereas the data from sites in south Bulgaria (see

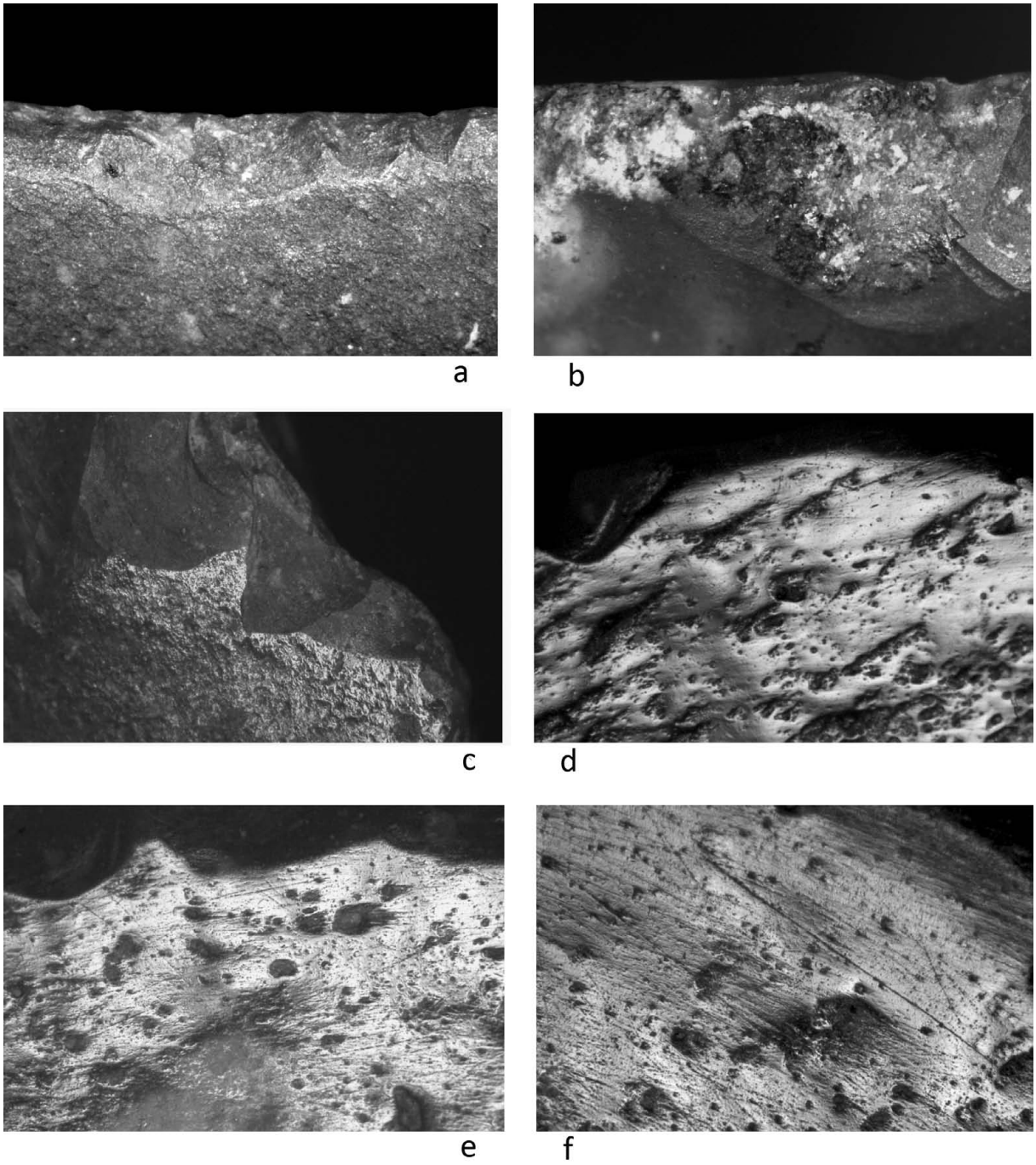


Fig. 60. Photomicrographs of use-wear traces on artefacts illustrated in fig. 57: a – cutting dry hide (x80); b – cutting fresh hide (with residue) (x80); c – relict traces of cutting plants (x100); d–f – cereal polish (x100)

Case studies nos 4–5, Ilindentsi and Yabalkovo) are contradictory, with a clear dominance of sickle inserts (cereal harvesting) recorded. At Varbitsa, blades and typological tools were both involved in animal product processing, with typological tools predominating; the same holds for the proportion of artefacts serving as sickle inserts. As for the last-mentioned, their small number can be explained by the fact that some of them, after damage to the sickle, fell on the field, and also by the fact that each sickle, as a composite tool, has a long-lasting use, includ-

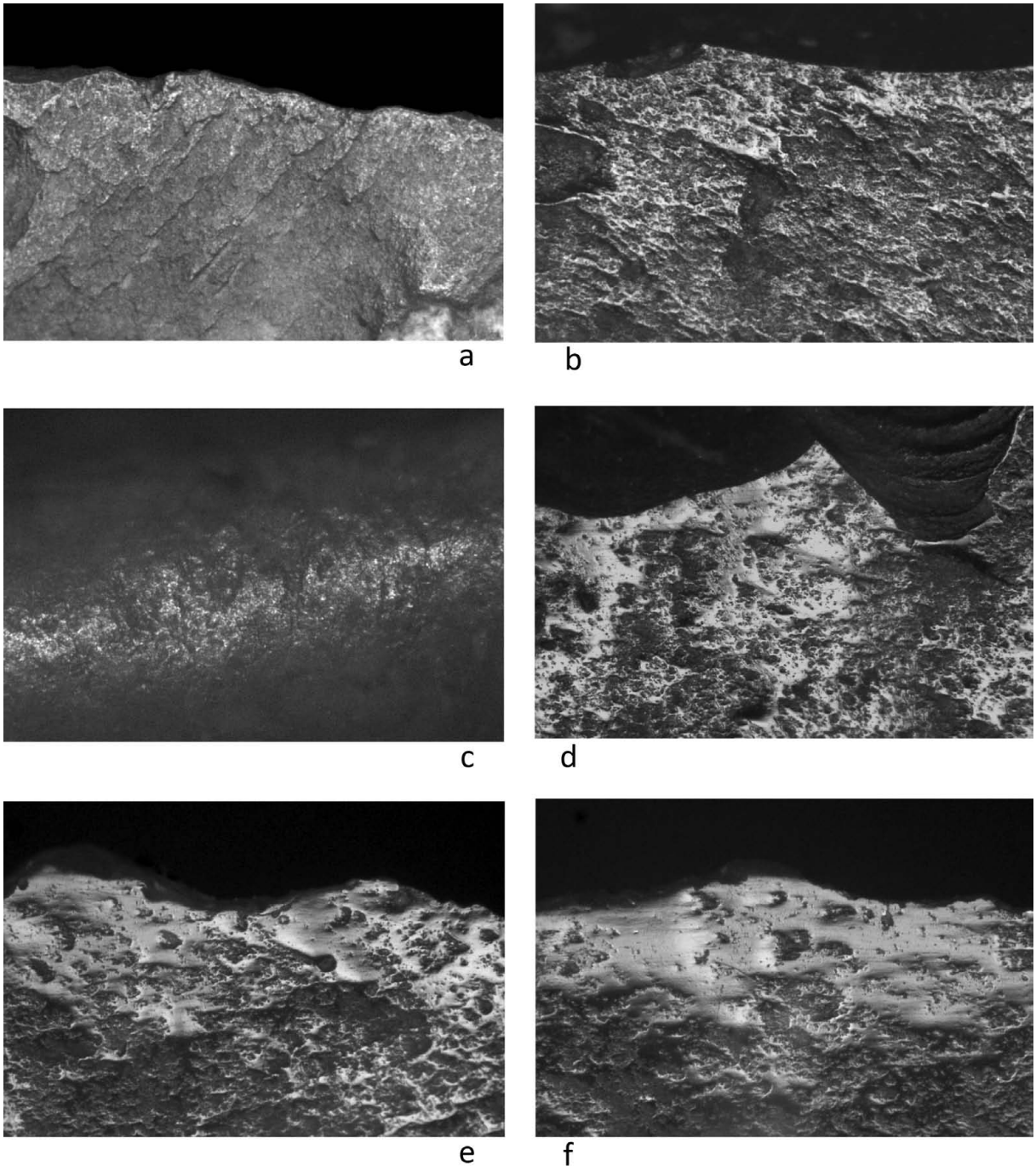


Fig. 61. Photomicrographs (x100) of use-wear traces on artefacts illustrated in fig. 59: a – sawing of bone/antler; b – cereal polish (initial stage); c – fresh hide scraping; d–f – cereal polish

ing regular resharpening of the inserted elements. It should be stressed that all sickle inserts from the assemblage have angular polish, suggesting oblique insertion in a curved handle; so, again, the use of the classical Early Neolithic Karanovo type of sickle is recorded. Other direct evidence for that consists in two fragments of antler sickle handles (layers VIIA and VIIB) with preserved parts of the grooves, in one of which an adhesive residue is preserved. Unfortunately, no residue analysis was undertaken.

The typological tools were primarily engaged in various activities at the site (in total, 14 identified functional tools), among which are eight retouched blades, four truncations, and single examples of an endscraper and a borer. Among the sickle inserts, those with unilateral use prevail (figs 57.5; 58.6; 59.2; 60d; 61b). In two other cases, the blades were reversed in the handle (with plausible resharpening of the working edge) (figs 57.3; 59.5; 60e–f; 61d–f). It is noteworthy that four of five sickle inserts belong to the Early Neolithic formal toolkit of Balkan flint(-like) and are represented at the beginning of the sequence (layer X) and in its final phase (layers IIC and IV) (figs 57.3, 5; 59.2, 5). One blade with fine retouch was used bilaterally for meat/fresh hide cutting and bears residues (figs 57.1; 60b). Three retouched blades were engaged in dry hide cutting (fig. 57.4). The only used endscraper with a Chalcolithic appearance served for frontal scraping of hide (figs 59.8; 61c). There is one blade with longitudinal use on indeterminate material and an *a posteriori* fashioned borer exhibiting relict traces of plant cutting (fig. 57.6);

The used blades show no noticeable morphometric variability but span a wide range of activities. Two blades were used as sickle inserts with, respectively, one and two working edges (fig. 55.9). Two blades show bilateral sawing of fresh bone/antler (figs 58.1; 59.1; 60a). Their lengths and discontinuous use-traces suggest the blades were longer before and during use, and were subsequently broken. Two blades (including the larger one) were used for meat/hide processing (fig. 57.9; 59.3); another served for dry hide cutting (fig. 57.2; 61a). Four blades show a longitudinal cutting kinematic on indeterminate material;

A flake, the largest in the assemblages (from Trench 2) has utilization traces of (non-cereal) plant cutting with a lateral, slightly concave edge.

General observations and discussion

The Varbitsa assemblage allows some observations and raises questions that will be discussed below.

- In general, two heterogeneous assemblages/components (in raw material and techno-typological aspects) are present. One came mainly from the surface and corresponds to the characteristics of a typical Chalcolithic flint industry. Several artefacts in this small assemblage belong to the distinct Neolithic strata, and an explanation of this contextual 'discrepancy' may relate to the pit-dwelling (with reworked material) dug during Late Antiquity. The second assemblage/component comprises artefacts from layers XV to IIA. It can be defined as Early Neolithic, revealing typical formal tools/toolkit characteristic of the Early Neolithic *koiné* of Karanovo I–II. The characteristics of this cultural unit are durable and persist until the end of the Varbitsa sequence, which, theoretically, should belong to the transition to, and the first phases of, the Late Neolithic. As mentioned, among the artefacts from Varbitsa, no trend towards microlithisation is evident: no small or microcores, series of bladelets, micro-endscrapers, or geometric microliths are present. In this sense, the Varbitsa assemblage noticeably differs from the studied assemblages from northeast Bulgaria and particularly that from the Late Neolithic site of Usoe (Скакун 1994; Gatsov 1990). Comparison with the recently published assemblages of Ovcharovo–Gorata and Durankulak–Blatnitsa, dated[2] to the second phase of the Early Neolithic (Скакун и др. 2018, 28) and the "early phase of the Hamangia culture" (Скакун и др. 2016, 83) further confirms this observation. On the other hand, a comparison with the Early Neolithic

2 The interpretation is provided by N. Skakun, B. Mateva, T. Dimov and I. Angelova

assemblages from Koprivets would be challenging. Still, the lack of publication of the flint assemblages from old and new investigations of the sites creates uncertainty and confusion. This is based on an unpublished PhD thesis by R. Zlateva, with later interpretations by I. Gatsov and T. Tsonev (for more details on this topic, see Gurova 2018b, 122–123);

- The assemblage from Varbitsa raises thoughts on the question of the emergence of Ludogorie flints in a clear Neolithic context. For decades, the so-called "Dobrudzha flint" has been a kind of mythology, based on a superficial or incorrect reading of the term, used by E. Comşa (Comşa 1976)[3]. In various publications, the term is interpreted differently, with the most frequent meaning being that flint originates in the Bulgarian Dobrudzha (Ludogorie region) and, *ergo*, is referred to as the Ludogorie flints (described by C. Nachev) (Начев (2009). The sporadic appearance of Ludogorie (Dobrudzha) flint in the Early Neolithic flint assemblages from western Bulgaria was noted by N. Skakun, who, however, emphasized that this flint exploitation and distribution began in the Chalcolithic (Skakun 1993, 54). The origin of the large Neolithic blades from Thrace (mainly from Tells) was viewed by T. Tsonev as an import of Ludogorie raw materials (Tsonev 2004, 262). The macroscopic similarity of Kriva reka type flint with typical Balkan flint also led me to this hypothesis, presented in early research (Gurova 2008a). Later meticulous multidisciplinary analyses of the raw material varieties convincingly disproved this hypothesis, but the visual resemblance between Balkan flint and the Kriva reka type continues to fuel speculation. Nevertheless, the question of the earliest recorded (pre-Chalcolithic) appearance of Ludogorie flint in the prehistoric assemblages remains open and demands relevant analyses to be conducted on artefacts with secure Neolithic contexts and compared to the Ludogorie flint samples;

- The Varbitsa and Neolithization debate is a topic to be addressed with the expectation of providing new insights into the emergence of the first farmers in northeastern Bulgaria. Even as a preliminary observation, it can be affirmed that the site occupies a strategic location vis-à-vis the provenance and distribution of raw materials involved in the full Early Neolithic 'package'. There is no evidence of workshops for the initial production of either Balkan- or Shumen-type flints. On the other hand, there are formal tools of Balkan flint(-like) material, similar to those from the Karanovo I–II cultural milieu, suggesting interactions between these areas in the Early Neolithic. Based on GIS analyses of raw material distribution pathways, it can be assumed that the Varbitsa site was suitable as a redistribution point for Shumen I and II flints to the Thracian plain in the Early Neolithic. On the other hand, Dzhulyunitsa and Varbitsa are well situated for the mutual exchange of Balkan flint and Shumen I–II flints when the sites were inhabited simultaneously (Gurova et al 2022b, fig. 15; 2025, 31, footnote 46, fig. 11). It should be stressed that the results from micropetrography and trace element analysis have shown similarities between artefacts from Varbitsa, Dzhulyunitsa and Karanovo, particularly in grey white-spotted flints with no precisely identified provenance (Gurova et al. 2022б, 21, 23). Varbitsa is undoubtedly one of the critical sites in northern Bulgaria. Its role in establishing the Early Neolithic lifestyle both regionally and supra-regionally should be seriously reconsidered, which I hope will happen once the site has been fully published, with all finds meticulously analysed and ^{14}C dates included.

3 See more in Gurova 2011a, 104-5.

1.2. CASE STUDY NO. 2: FLINT ASSEMBLAGE FROM DZHULYUNITSA

Introduction

This Case study provides new data from one of the most important Neolithic sites in Bulgaria – Dzhulyunitsa–Smardesh (known as Dzhulyunitsa). The importance of this site has been emphasized in my previous publications, based on the results of a pilot study of 178 artefacts from the earliest phases, which highlighted the potential role of Dzhulyunitsa in the procurement of Balkan flint and its subsequent distribution to pre-Karanovo enclaves in south Bulgaria (Gurova 2012b; 2018b, 121–123; Gurova, Bonsall 2014a, 123–124). In this detailed study, I present additional evidence to test this hypothesis (see also section 2.3.3 in Part I).

The site has been excavated since 2001 by the archaeologist Nedko Elenski from the Regional Museum at Veliko Tarnovo. Annual reports on the fieldwork are published by the National Institute of Archaeology and Museum–BAS in a series entitled Archaeological Discoveries and Excavation. In addition to these regular reports on the site investigations, several analytical papers on the pottery assemblages have been published by the excavator (Elenski 2006, 2008). Additionally, there is a significant series of publications presenting various aspects of the multidisciplinary research on the finds and offering general and conceptual overviews (Dzhanfezova et al. 2014; Krauss et al. 2014; Marinova, Krauss 2014; Weninger et al. 2014; Groene et al. 2018; Kamjan et al. 2021).

Dzhulyunitsa in its chrono-cultural context

The site represents a large but low tell, lying on the Yantra River terrace, ca. 6 km south of the river itself (fig. 62.1). The site has been excavated in numerous, mainly small, trenches. The location of these trenches aimed to determine the inhabited areas and their succession in the entire sequence of this large, multilayer settlement (see Krauss et al. 2014, 53, fig. 2).

The cultural sequence of the site comprises four phases of Early Neolithic strata, with sporadic post-Neolithic disturbance by Late Iron Age, Late Antiquity and Early Middle Ages pits. In some trenches, in the eastern part of the settlement, a significant accumulation of Chalcolithic and Early Bronze Age remains has been revealed. The focus of the excavations is the exploration of the Neolithic layers, within which four Neolithic phases have been distinguished, representing an "entire Early Neolithic sequence of the eastern Balkans" (Krauss et al. 2014, 54, 57). Among the Neolithic strata, the most important and best documented are layers I (the oldest, lying directly on the loess) and II, both of which offer a variety of finds and house structures. Despite its thicker deposits, layer II yielded a significant accumulation of finds and pottery assemblages. Dark-painted wares dominated the first layer (phase), but white painting was evident in the pottery repertoire of the later phase (Krauss et al. 2014). Based on comparative analyses of the pottery, several key observations and conclusions can be drawn.

In a regional context, the earliest phase (Dzhulyunitsa I), with its monochrome, dark-burnished wares (and scarce dark-brown and black-painted pottery), is attributed to a cluster of Early Neolithic sites in the catchments of the Rivers Yantra and Rusenski Lom. These sites include Dzhulyunitsa, Beliakovets–Plochite, Orlovets, Koprivets, Pomoshtitsa, and Hotnitsa–Pesherata/Iztok. Culturally, this cluster represents a new regional cultural *koiné* with a recognizable identity, based exclusively on pottery characteristics (Elenski 2008, 96; Krauss et al. 2014; 2017; Krauss 2023). On a supra-regional scale, convincing parallels are attested with West Anatolia, with Classical Fikirtepe and Ilıpınar IX–VIII (in the Marmara area), as well as

with Ulucak Va and IV, Çukuriçi Höyük, Ege Gübre and Yeşilova (Krauss et al. 2014, 2017; Krauss 2023). In Dzhulyunitsa II, the appearance of white-on-red painted pottery connects this phase with the Karanovo I culture in Thrace and its cultural alliance in the Struma Valley and Sofia Plain. Parallels with Aşağı Pınar 7 in Turkish Thrace and Ulucak IV h–l are recognized (Krauss et al. 2014, 59). According to the excavator, the earliest regional identity corresponding to Dzhulyunitsa I and II shows direct connections with Anatolian sites such as Hoca Çeşme, Ilıpınar, Kuruçay, Hacılar, Höyücek, Bademagacı and Mersin (Elenski 2008, 102).

An innovative archaeometric study of painted pottery sherds from Dzhulyunitsa suggested that dark-coloured sherds from the earliest phase (Dzhulyunitsa I) are rather burnished than painted, thus reinforcing the arguments in favour of a monochrome phase distinct in the Dzhulyunitsa Early Neolithic sequence (Dzhanfezova et al. 2014, 148). Another significant finding of this study is the highly advanced pottery technology from the earliest Neolithic phase of the site, which retained an ideal fabric from the west Anatolian homeland but adapted perfectly to the loessic clay of central north Bulgaria (ibid., 2014, 154–155).

All ^{14}C dates from Dzhulyunitsa I and II were submitted to Bayesian modelling. Thus, the beginning of the sequence and the time span of lowermost layers I and II can be reliably fixed between 6050–5950 cal BC (Krauss et al. 2014, 63). In the context of the high-resolution calibrated radiocarbon chronology of the Aegean, and west and northwest Anatolia, Dzhulyunitsa is considered a key site for the Neolithic spread into Central Europe, being "… not only one of the oldest Neolithic sites in the Balkans, but also remained inhabited throughout the entire period of the neolithization process, offers a key to understanding this development in the Balkans (Krauss 2023, 12). Another radiocarbon calibration model gives the time span of Dzhulyunitsa I and II as 6020–5970 cal BC (Thissen, Reingruber 2017, 161).

Interestingly, later publications based on the same dating assign the Early Neolithic sequence of Dzhulyunitsa to around 6200 cal BCE (Kamjan et al., 2021). However, the exact beginning of the Early Neolithic sequence remains a matter of debate. In the latest report by the discoverer, the earliest phases I and II of Dzhulyunitsa are dated to 6200–5959 cal BC (Elenski, 2020). The discrepancy regarding the beginning of the strata continues with the recently published dates: 6005 cal BC (based on dated bone samples – Krauss 2023, 238, Table 5) and 6446 cal BC (based on bone samples as well – Krauss 2023, 244, Table 7).

Chipped-stone assemblages

In addition to the small sample of 178 artefacts mentioned above, a further 1318 artefacts from the Early Neolithic strata have been studied and are presented below. The chipped-stone assemblages came from different years and trenches/contexts. Given that the explored area represents only a small part of the large Early Neolithic settlement, the assemblages are treated without regard for the excavated units; the only distinction made is their attribution to the phases Dzhulyunitsa I and II. The excavator made this distinction based on sedimentological and stratigraphic observations and a detailed comparative analysis of finds (mainly pottery).

The studied assemblages have been subjected to macropetrographic raw material distinction and grouping, as well as techno-typological and use-wear analysis. The latter was carried out in two steps: a preliminary microscopic observation at the Museum of Veliko Tarnovo, using a Zeiss SMXX stereomicroscope at magnifications up to x80. All typological tools, most blades, and selected flakes were microscopically observed, and a series of artefacts with detectable utilization traces were subsequently separated. These were further analysed in Sofia using an

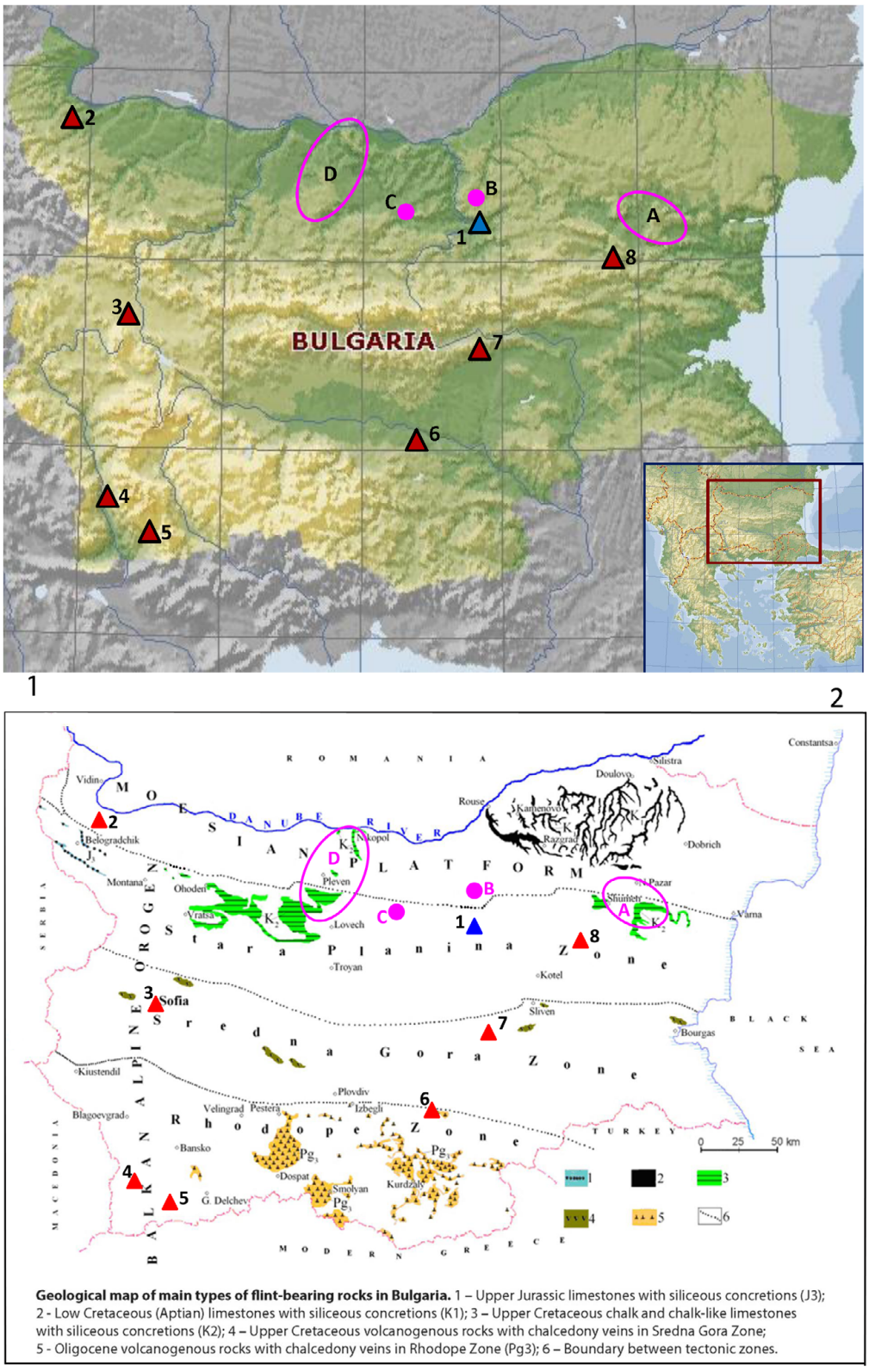


Fig. 62. 1. Map of Bulgaria with important sites mentioned in the Case study's text: 1. Dzhulyunitsa; 2. Yarlovitsa; 3. Slatina–Sofia; 4. Ilindentsi; 5. Kovachevo; 6. Yabalkovo; 7. Karanovo; 8. Varbitsa. Flint outcrops are marked in pink: A – Shumen cluster of outcrops; B – Varbovka; C – Lozen; D – Pleven–Nikopol cluster of Balkan flint outcrops; 2. Geological map by C. Nachev with the same sites and outcrops (first published in Gurova, Nachev 2008, fig. 5, here with additions by M. Gurova)

MBS-10 stereo microscope (up to x100) and a Keyence VHX-100 digital microscope (x25-x150). The latter was used for the photomicrographs taken at x100 (with 3 at x80).

The assemblages will be presented below, following a traditional structure and (apart from the raw material section) keeping the distinction between the Dzhulyunitsa I and II phases.

Raw materials: characteristics and procurement strategies (figs 62–69)

The raw material of Dzhulyunitsa has already been included in an interdisciplinary study of archaeological and geological samples from Bulgaria to relate the artefacts to their geological source. From the first innovative study, combining micropetrography with geochemistry using LA-ICP-MS and trace element analysis (EPMA), the yellow, white-spotted artefacts from Dzhulyunitsa were found to be distinctive compared to other Balkan flint artefacts from Early Neolithic sites in south Bulgaria (Bonsall et al. 2010, 13). Later, alongside more intensive raw material prospections in north Bulgaria, a larger series of archaeological and geological samples were subjected to combined archaeometric analyses. The artefacts from Dzhulyunitsa fit perfectly with the clusters of the Mezdra Formation Upper Cretaceous outcrops and with artefacts from Early Neolithic sites in south Bulgaria (Gurova et al. 2016, 433, 435, fig. 10, SI Appendix fig. 6) (fig. 62.2).

The raw material spectrum of the Dzhulyunitsa I and II assemblages is illustrated in fig. 63. Dzhulyunitsa is one of the very few Neolithic sites to display isolated obsidian finds, which represent exotica in the context of prehistoric chipped-stone assemblages from Bulgaria. Two obsidian artefacts, respectively from phases I and II, were analysed using non-destructive ED-XRF. They both originated from the Carpathian 2E source area in Hungary (Bonsall et al. 2017, 55). Apart from the obsidian, there are a limited number of artefacts of white quartzite (21 pieces) and two pieces of rock crystal.

All other artefacts (macroscopically) represent various types of flint (figs 64–68). Visually they could be separated into five categories: i) typical Balkan flint – yellow (yellow-beige) with white-spotted inclusions, which is present in both phases with slightly increasing importance into the second phase; ii) macroscopically distinguishable colouristic variations of the Balkan flint (more beige and greyish) with white inclusions as well; iii) grey-beige, creamy white-spotted flint; iv) dark-grey white-spotted flint; v) varia – items of presumably local flint – yellow with violet concentric intrusions.

Formally, most of the varieties (i to iii) could be interpreted as colouristic varieties of Balkan flint (see, for ex., the yellow-grey zonation of flint concretions from Muselievo, Zhernov, Nikopol and Beglezh in north Bulgaria (Gurova et al. 2016, figs 3.b, g; 4.f, g; Gurova et al. 2022b, fig. 6.1). As for the dark-grey, white-spotted flint at Dzhulyunitsa, it represents the second most common type in the raw material spectrum. This type of flint occurs among all categories of artefacts, including formal tools (figs 64–68). It is noteworthy (and it was mentioned in Part I) that the combination of Balkan flint and white-spotted dark-grey flint is common among the Early Neolithic flint assemblages from sites in north Bulgaria, as well as among assemblages from sites in south Bulgaria, belonging to the Karanovo I techno-cultural complex (Gurova et al. 2022b, fig. 4). Both flint types are represented among all artefact categories, including the formal tools, but in a much lower proportion than the Balkan flint (fig. 69).

Among common raw materials, Balkan flint is crucial owing to its role in Neolithization and in the diagnostic Early Neolithic assemblages from sites of the Karanovo I cultural alliance. Its provenance in the Pleven–Nikopol source cluster is proven (Gurova et al. 2016; 2022b).



Fig. 63. Raw materials in the chipped-stone assemblages from Dzhulyunitsa



Fig. 64. Cores of dark-grey flint: 1 and 2 from Dzhulyunitsa I; 3 – from Dzhulyunitsa II; double-platform/bipolar naviform-like core (2)



Fig. 65. Artefacts from Dzhulyunitsa I: blades and bladelets; two geometric microliths (trapezes) in the middle



Fig. 66. Blades of Balkan flint and dark-grey flint from Dzhulyunitsa II (Trench XII)

However, very similar flint was identified in Shumen and nearby (Gurova et al. 2022a). As for the dark-grey flint, well represented within the Dzhulyunitsa I–II assemblages, its significance remains uncertain. The latest analytical studies suggest that its potential outcrops are in the Shumen region (Shumen II flint type) and /or in the Lower Cretaceous Kovachevo Formation

near the villages of Lozen and Vinograd, in the Veliko Tarnovo district. Still, this raw material type needs further investigation – both geological survey and laboratory analyses (Gurova et al. 2022b, 23–24).

Regarding the yellowish flint with violet zonation found in a secondary deposit near the village of Varbovka, micropetrographic and geochemical analyses of a sample of this flint have shown its similarity to Balkan flint (ibid., 17, fig. 5.1). Our latest raw material (particularly Balkan flint) provenance studies have recently been published, based on 77 artefacts from the emblematic Early Neolithic sites of Bulgaria (including 15 items from Dzhulyunitsa) and some new geological samples from the above-mentioned Lozen and Varbovka sources (Gurova et al. 2022b). The publication offers a solid geochemical dataset for further comparative analyses. The results allow the following observations: i) most of the Dzhulyunitsa artefacts exhibit Balkan flint characteristics; ii) there is a subgroup of Balkan flint, consisting of artefacts from Dzhulyunitsa and Karanovo only, which possess distinctive micropetrographic and trace element signatures; iii) some grey flint samples resemble the Lozen and Shumen II (Markovo) raw materials; iv) two artefacts do not match any of the raw materials analysed (Gurova et al. 2022b, 20–21, figs 3.1; 11.2). The results (and the observations and conclusions based on them) are instructive for raw material procurement and consumption in Dzhulyunitsa I and II, and for the subsequent transmission of raw materials and secondary knapping products to other Early Neolithic communities in south Bulgaria.

Techno-typological analysis

The techno-typological descriptions are based on the following classification/differentiation:

- typological tools (n=73);
- debitage products (1211) consisting of:

a) blades (fragments included)(n=234);

b) flakes (only entire pieces)(n=615);

c) fragments (n=362) – distinguished as flake fragments (pieces with morphological parameters suggesting fragmented flakes, but without butts or proximal parts) and indeterminate fragments, including chips (pieces smaller than 1 cm) and chunks – bigger fragments. In some studies, such pieces are referred to as debris.

- cores (n=15);
- varia (n=19) (including pieces outside the groups mentioned above).

The general structure of the assemblages is presented in Table 7. The descriptions, notes, and correlative observations within each assemblage and between them are presented in the sections below.

Table 7

Phase	Tools	Blades	Flakes	Fragments	Cores	Varia	Total	Used
DZH I	24	87	253	181	4	9	**558**	*31*
DZH II	49	147	362	181	11	10	**760**	*49*
TOTAL	**73**	**234**	**615**	**362**	**15**	**19**	**1318**	*80*

Table 7. General structure of the assemblages by techno-typological categories

I. DZHULYUNITSA I (figs 64.1–2; 65; 70–71; 72.1–2)

The structure of the Dzhulyunitsa I assemblage shows significant differences among the various categories of artefacts; debitage pieces (n=521) overwhelmingly predominate and comprise 98.7% of the assemblage.

Typological tools (n=24) of which: eight retouched blades, four splintered pieces, two trapezes, two retouched flakes, two endscrapers, two truncated blades, one simple burin, one notched blade and two undetermined tool fragments. The retouched blades are most numerous; only one has unilateral retouch, and seven are bilaterally retouched. Among the latter, significant variability is noticeable – from small bladelets to sufficiently representative blades with marginal and alternate retouch (figs 70.6; 71.4, 10). The most significant is one real formal tool in the pure sense of its diagnostic features (except the size) – a blade of Balkan flint with steep bilateral retouch (fig. 70.3). Two trapezes are present: one with small abrupt retouch only on the non-parallel sides (fig. 70.1), and the second thinner with no-parallel sides and a shorter base fashioned by small abrupt retouch (fig. 70.2). The splintered pieces are well represented (fig. 71.5). Both endscrapers are on flakes (fig. 70.10). Among the retouched flakes, there is a small piece with bifacial partial retouch (fig. 71.7) and a robust cortical flake with high, slightly denticulated retouch, which could be mistaken for a flake with initial removals/core exploitation (fig. 70.11).

Debitage products

- blades (n=87), represented by fragments: 35 proximal (figs 70.9, 14; 71.3, 16); 27 mesial (figs 70.5, 7–8, 13; 71.2, 8), seven distal (fig. 71.9), and 18 entire blades (figs 70.15; 71.1). Technologically, all blades most likely were removed by punch technique, based on the large single blow butts of many of the proximal fragments and entire specimens. It is not impossible, but neither provable to suppose the use of the pressure technique of blade detachment. The ratio of trapezoidal to triangular sections is 49:38, indicating an evolved stage of the core reduction sequence. The dimensions of the blade vary significantly: length between 1.8 and 12.6 cm, width between 0.8 and 3 cm, and thickness between 0.3 and 0.8 cm. The largest blade in the whole assemblage is a second trimming blade of 12.6 cm in length (fig. 71.2). This blade suggests that blade production using large cores took place somewhere on the site, or that massive blades were transported to the site for subsequent breakage and use, and/or for fashioning into tools;

- flakes (n=253) with a strong prevalence of pieces between 1.5 and 4 cm (n=202), followed by 31 items between 4 and 6 cm, two massive flakes exceeding 6 cm in length and 18 small flakes (up to 1.5 cm). The butts are mainly large and flat, indicating a flat (single-blow) striking platform on the cores from which the flakes were removed by direct percussion; sporadic linear, broken, and natural butts are present. Cortical flakes number 56 and could be related to the initial stage of core maintenance and exploitation, activities that most likely had been carried out in the unexplored part of the settlement;

- fragments (n=181), of which 125 are flake fragments, and 56 are undeterminate fragments or chunks with prevailing dimensions between 1.5 and 4 cm. There are eight pieces over 4 cm and 14 chips (up to 1.5 cm). Fragments retaining cortex are 23.

Cores (n=4) are represented by two single-platform exhausted flake cores of Balkan flint (less than 3 cm in removal surface length) and two quite big cores of dark-grey flint with partially remaining cortex on the lateral sides and the back. One of the cores is a single-platform core for flakes and blades with dimensions 6.6 x 8.6 x 5.8 cm (figs 64.1; 72.1). The striking



Fig. 67. Blades and typological tools from Dzhulyunitsa II



Fig. 68. Flakes, blades and typological tools from Dzhulyunitsa II: 1 and 3 – from structure/pit 104; 2 – from the layer



Fig. 69. Artefacts of Balkan flint and grey flint from the sites of: 1 – Karanovo; 2 – Kovachevo; 3 – Varbitsa

platform is flat/single-blow with no traces of rejuvenation. The core is not exhausted, and a tentative attempt to prepare a new striking platform is evident. The second core is a well-known type of double-platform/bidirectional core for blades with a common/shared removal surface (bipolar unifacial convergent debitage). Its dimensions are 8.6 x 5.8 x 5 cm, with a maximum blade negative length of 5.5 cm and maximal width of the removal surface/platform of 6 cm (fig. 64.2; 72.2). Both striking platforms are flat (single-blow) and show a noticeable inclination toward the core back, ensuring continuous knapping. This example resembles a naviform core and, to my knowledge, represents a unique example of this type among the Early Neolithic assemblages from Bulgaria (quite possibly unique in the whole of the Balkans). In general, the double-platform cores are rare among the assemblages from north-central Bulgaria and westward at the site of Ohoden (Tsonev 2007, 63; Zlateva-Uzunova 2009, 64). This core differs from the known Balkan flint single-platform cores from the Early Neolithic site of Yarlovitsa, most of which were reused as hammerstones (Gurova et al. 2021, 263, fig. 3; see here Case study no. 3).

Varia (n=9), of which four are flint concretions with tentative initial exploitation or just testing of the raw material. Four flakes show relicts of the core removal surface on their dorsal faces, indicating a technological accident in some preceding core reduction sequence. One piece of rock crystal is also present.

2. DZHULYUNITSA II (figs 64.3; 66–68; 72.3–4; 73–75)

The structure of the Dzhulyunitsa II assemblage also shows marked disproportions between the categories of artefacts; debitage pieces (n=690) far outnumber all other categories and constitute 90.7% of the assemblage for the Early Neolithic phase II. Their potential export could explain the large quantity of blades and supports the hypothesis that the site played a role in Balkan flint networks by distributing blanks.

Typological tools (n=49) of which: 20 retouched blades, nine endscrapers, nine retouched flakes, seven splintered pieces, one trapeze, one perforator, one combined tool – truncation/endscraper, one undetermined tool fragment. The blades with unilateral retouch number 8 items and demonstrate noticeable variety: from fragmented blades up to 5 cm long with marginal, sometimes ventral retouch (figs 73.8, 12; 75.8) to a blade of 11.5 cm with irregular, semi-steep retouch on the proximal part (fig. 74.3). The blades with bilateral retouch exhibit a rich spectrum of fashioning: simple marginal (including alternate) retouch (fig. 75.11–12); a combination of simple continuous/discontinuous and irregular ventral retouch (figs 73.5); and ventral plus alternate retouch on the second edge (fig. 74.2). One of the blades has bilateral high and steep retouch, a slightly convex distal part and ventral proximal and distal retouch (fig. 73.3). The tool matches perfectly the criteria of a formal tool, diagnostic of Early Neolithic assemblages of the Karanovo I–II cultural milieu with the only difference being that this artefact is made of a grey, high-quality, white-spotted flint. It was most likely a borer on a bilaterally retouched blade, but the tip of the potential borer is broken. The endscrapers are very heterogeneous; only two are on blade-like flakes (fig. 75.9), and seven are on diverse blades. One of the endscrapers is double and on a massive blade (fig. 75.5). The fronts and lateral edges are variously fashioned with no sign of standardization. The retouched flakes are somewhat amorphous (fig. 75.7), the most interesting item being a small, backed, kombewa/janus flake (fig. 74.9). Splintered pieces, as expected, are well represented with variations of uni- and bipolar, and uni- and bifacial removals (figs 73.11; 74.10). One trapeze is present, with a backed, slightly concave, small base (fig. 75.10). A second formal tool (of Balkan flint) represents a perforator on a blade with bilateral

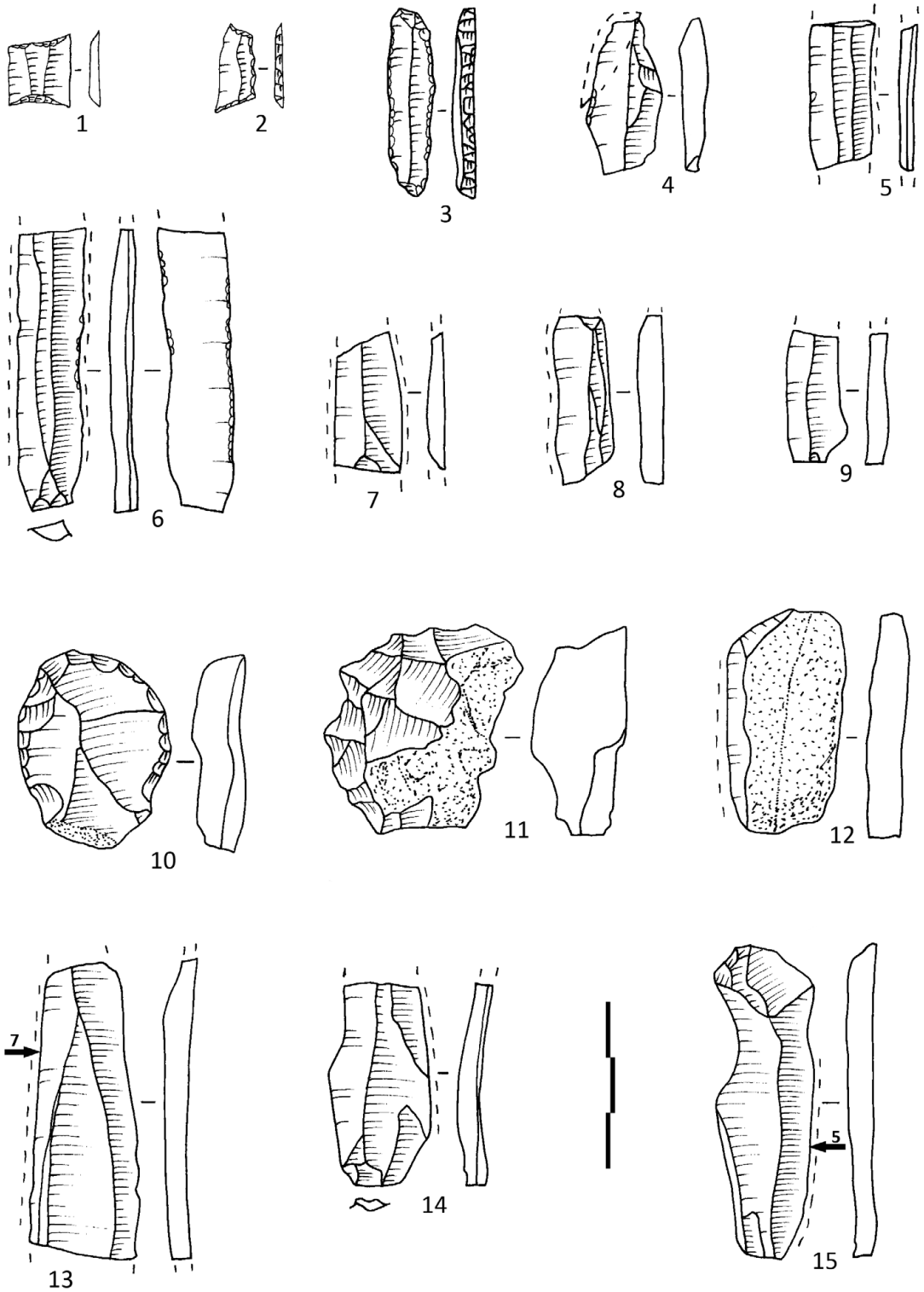


Fig. 70. Flint artefacts from Dzhulyunitsa I: tools (1–3, 6, 10–11), blades (5, 7–9, 13–15) and blade-like flakes (4, 12). Used edges are marked by a dashed line; the arrows show photomicrographs in fig. 76

high and steep retouch on the right edge (fig.74.6). The last tool is a combination of an oblique distal truncation and an endscraper fashioned on the proximal part of the blank (fig. 74.1).

Debitage products

- blades (n=147), represented by fragments: 65 proximal (figs 73.4; 74.7; 75.1, 4, 13); 49

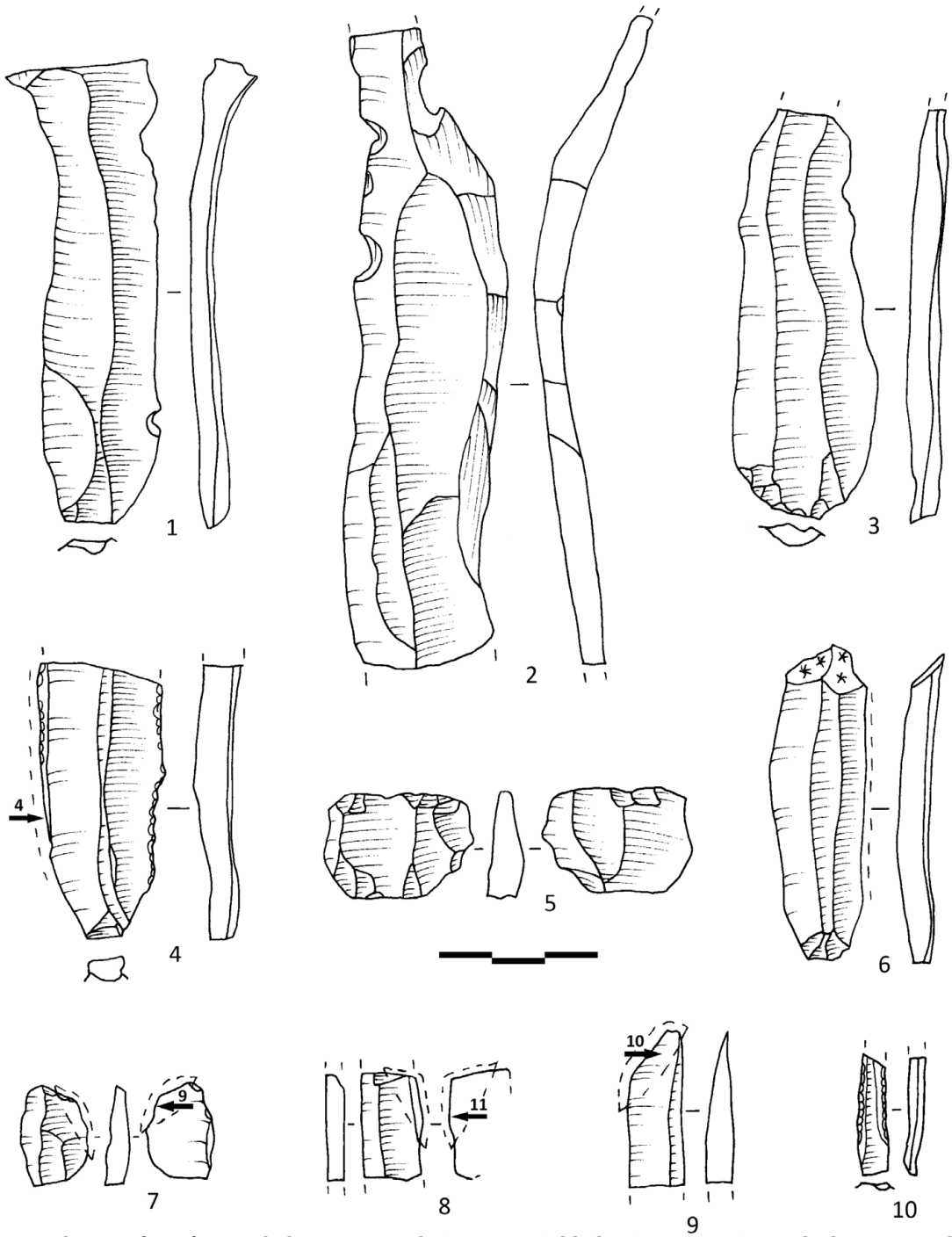


Fig. 71. Flint artefacts from Dzhulyunitsa I: tools (4–5, 7, 10), blades (1–3, 6, 8–9). Used edges are marked by dashed lines; the arrows show photomicrographs in figs 76 and 77

mesial (figs 73.6–7, 10; 75.14–15), 18 distal (fig. 74.8), and 15 entire blades (figs 73.9; 74.4–5; 75.2). Like the blades of phase I, the great majority of the butts are flat and not inclined, the bulbs are prominent, and the overhang is not abraded – all stigmata indicating indirect percussion using punch as the primary debitage technique. Some butts are broken, but no dihedral or faceted butts were observed. The ratio of trapezoidal to triangular sections is 90:57, with a prevalence of the former, in comparison with the blades of phase I. The dimensions of the blades vary significantly: between 0.8 and 9.3 cm long, between 0.7 and 2.8 cm wide, and between 0.2 and 1.2 cm thick. No blades exceed the dimensions of the largest blade from phase I,

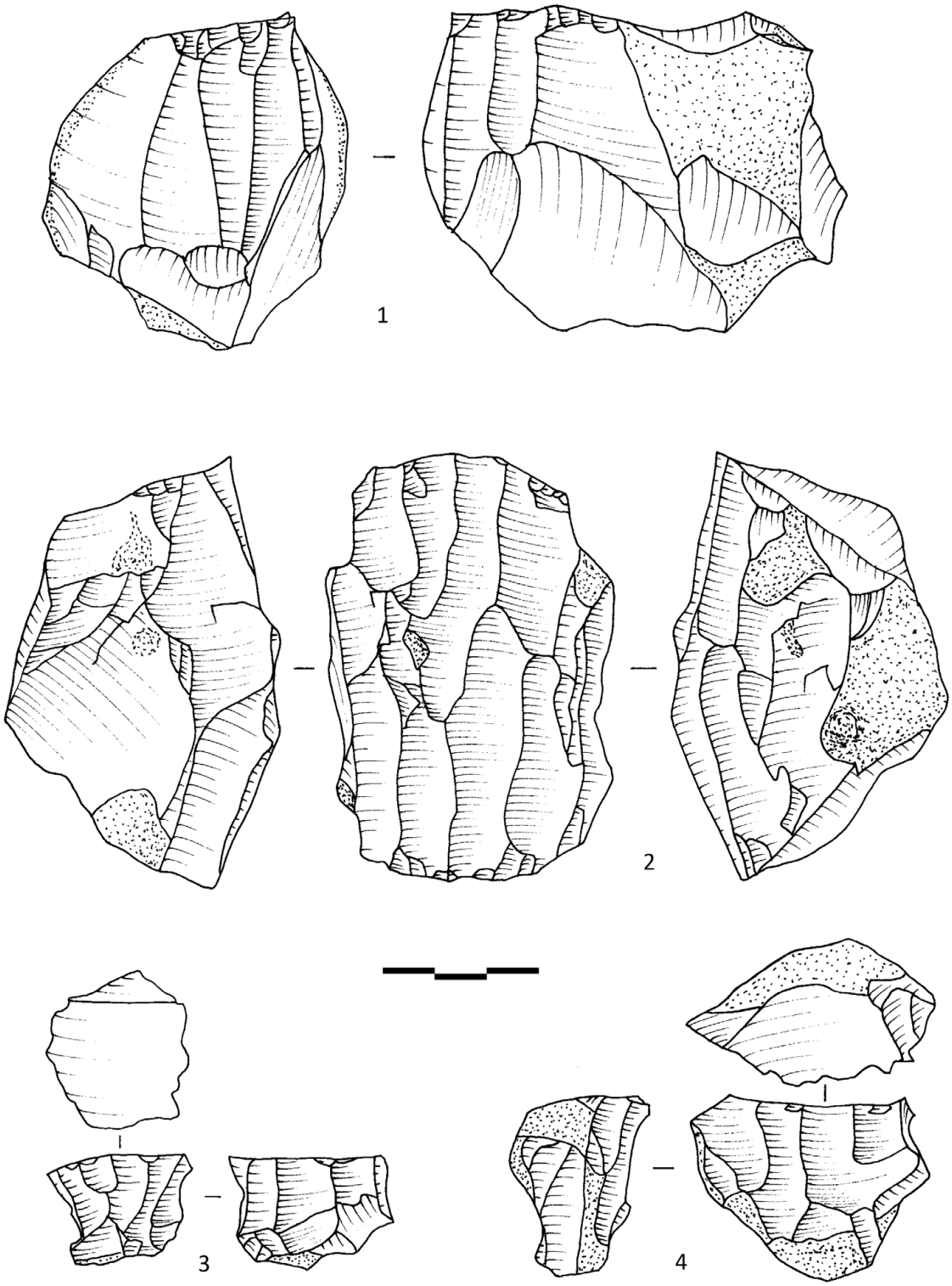


Fig. 72. Cores: from Dzhulyunitsa I (1–2); from Dzhulyunitsa II (3–4). Single-platform cores (1, 3–4; bipolar naviform-like core (2).

but noteworthy is a series of regular blades up to 7 cm long (as illustrated above);

- flakes (n=362) with a substantial prevalence of pieces between 1.5 and 4 cm long (n=293), followed by 56 items between 4 and 6 cm, two massive flakes exceeding 6 cm, and 11 small flakes (up to 1.5 cm). The butts are predominantly flat, occasionally linear, and broken and natu-

ral butts are present. There are 101 cortical flakes, and as a proportion of all the flakes, they are more numerous than in phase I, which could indicate more intensive core preparation;

- fragments (n=181), of which 112 are flake fragments, and 69 are undeterminate fragments or chunks with prevailing dimensions between 1.5 and 4 cm. Eleven pieces exceed 4 cm, and there are six chips (up to 1.5 cm). Eighteen fragments retain cortex.

Cores (n=11) are represented by only single platform cores exhibiting an advanced stage of reduction. Cores for flake removals prevail (n=7), and they are all exhausted and small (figs 63.3; 72.3–4). There is one core for bladelet removal, fashioned on a flake, two cores for blade and flake removals, one of which is in a good condition for continuing debitage: its dimensions are 4 x 3.8 x 3.3 cm, (fig. 73.1). The last core is a fragment (possibly the result of a knapping accident) of a single platform prismatic core for blades, the maximum length of the blade negatives being 5.3cm. Its removal platform is, in fact, the dorsal surface of a flake (fig. 73.2).

Varia (n=10), of which there is one massive flake with initial negatives, suggesting tentative exploitation as a core; three core rejuvenation tablets; four flakes with remaining negatives of the core removal surface on their dorsal parts. One piece of quartz and one piece of rock crystal are also present.

Functional connotations

As mentioned above, all typological tools, most on blades (apart from pieces with unsuitable morphometric parameters and those with heavy surface deposits) and selected flakes (with visual polishes and smoothed edges) were subjected to microscopic observation and use-wear analysis. In general, the artefacts have well-preserved edges, with rare taphonomic damage. Apart from detectable traces, there were ambiguous traces that could not identify the material worked. Twenty-four photomicrographs illustrate various microtraces, including the absence of use and postdepositional surface modifications (PDSM) in figs 76–78. Each photomicrograph has a number corresponding to those on the equivalent artefact in figs 70–71, and 73–75. A summary of the functional interpretation of the artefacts by phase is presented in Tables 8 and 9, and is commented on below.

1. Dzhulyunitsa I

There are three categories of artefacts with traces of use. The used tools and blades represent, respectively, 20% and 26% of the tools and blades in the Dzhulyunitsa I assemblage.

Table 8

Worked material	Tools	Blades	Flakes	Total
Cereals	1	3	1	**5**
Other plants	-	6	-	**6**
Bone	1	1	-	**2**
Hide	-	1	-	**1**
Meat/fresh hide	1	8	1	**10**
Undetermined hard material	1	1	-	**2**
Undetermined soft material	1	3	1	**5**
Total	**5**	**23**	**3**	**31**

Table 8. Worked materials by artefact category

- Used tools (n=5): two retouched flakes were used as follows: one for cutting meat/fresh hide and the other as a sickle insert (figs 71.7; 77.9). The burin had been used in bone processing; a truncated blade for cutting undetermined hard material, and a blade with bilateral retouch for bilateral cutting of soft material (fig. 70.6). A blade with bilateral retouch displays only ventral microchipping – an initial longitudinal operation is not excluded, but is not certain (figs 71.4; 76.4);

- Used blades (n=23): the most frequent use of the blades relates to butchering. Eight of them have weak traces of cutting meat (fresh hide) (fig. 70.5, 14). Plant processing is exhibited by six blades, used for cutting plants (silica-rich vegetable tissues) (figs 70.7–8; 71.6). In one case, an initial stage of cereal processing is not excluded (figs 70.13; 76.7). Three blades show typical cereal polish and served as sickle inserts (figs 71.8–9; 77.10–11). Use on an undetermined soft material was 'detected' on three blades. Single blades were used for cutting hide, hard material and fresh bone (fig. 70.15; 76.5);

- Used flakes (n=3), of which one was used for soft material, one likely for cutting meat/fresh hide (fig. 70.12). A third flake was a sickle insert (fig. 70.4).

2. Dzhulyunitsa II

There are only tools and blades with traces of utilization. They represent, respectively, 30% (for the tools) and 23% (for the blades) of the tools and blades in the Dzhulyunitsa II assemblage.

Table 9

Worked material	Tools	Blades	Total
Cereals	3	1	**4**
Other plants	1	3	**4**
Wood	1	1	**2**
Bone	3	2	**6**
Hide	2	5	**7**
Meat/fresh hide	1	10	**11**
Silica-rich material	1	-	**1**
Stone	-	1	**1**
Combined function	1	-	**1**
Undetermined hard material	2	3	**4**
Undetermined soft material	-	8	**8**
Total	**15**	**34**	**49**

Table 9. Worked materials by artefact category

- Used tools (n=15): 11 retouched blades (four with bilateral retouch), two retouched flakes, one endscraper and one combined tool (truncation/endscraper). The sickle inserts are represented by two retouched flakes (figs 74.9; 75.7; 77.12–14) and one bilaterally retouched blade (figs 75.6; 77.15–16). All three tools have angular polish, with the blade showing more pronounced striations. Three tools were involved in bone processing– two retouched blades (figs

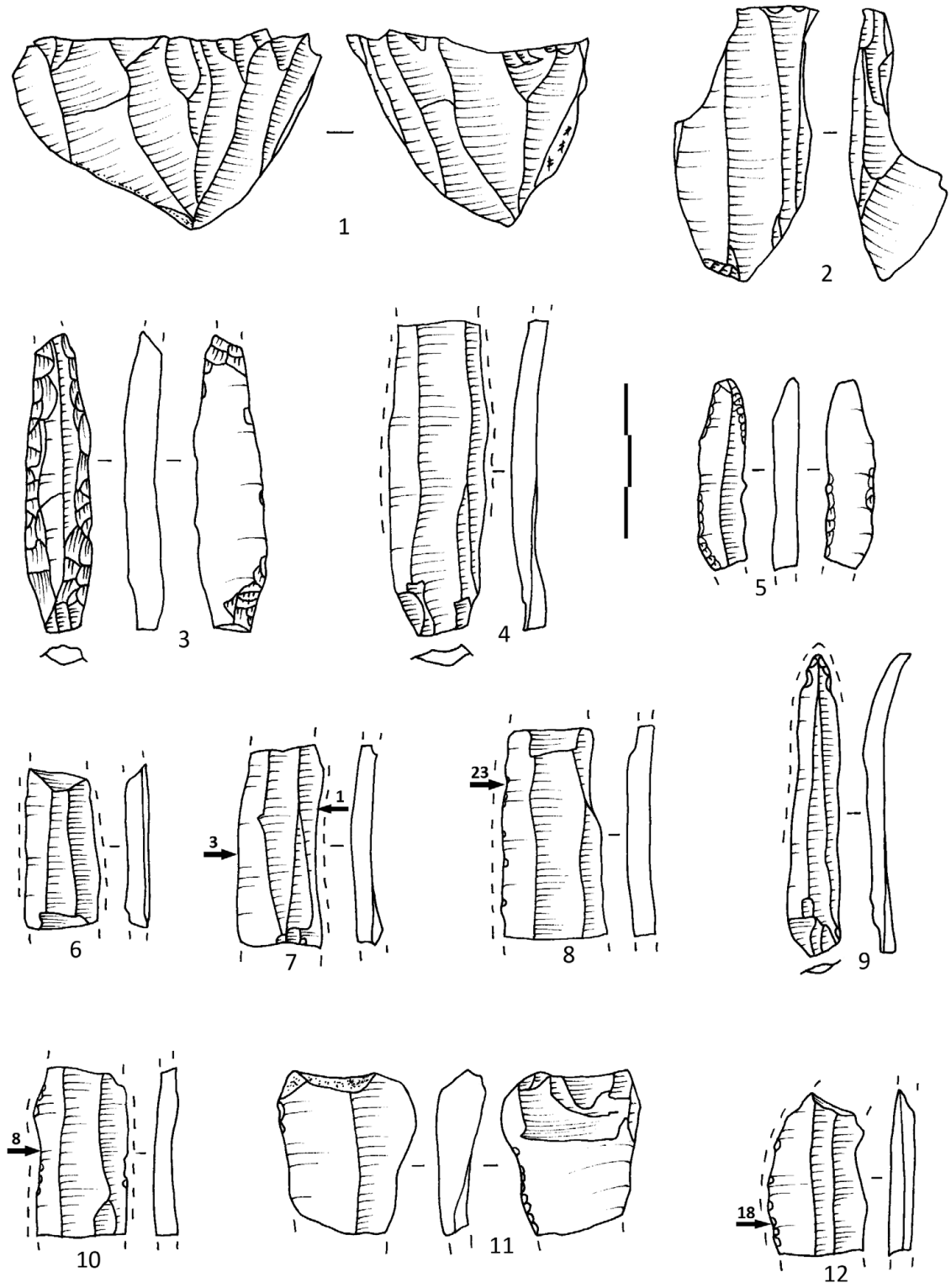


Fig. 73. Flint artefacts from Dzhulyunitsa II: cores (1–2); tools (3, 5, 8, 11–12), blades (4, 6–7, 9–10). Used edges are marked by dashed lines; the arrows show photomicrographs in figs 76 and 78

73.8; 75.11; 78.20, 23) and the double endscraper, used bilaterally (figs 75.5; 78.19). Hide treatment is attested on two retouched blades, in one case an abrasive additive is indicated (figs 73.12; 78.18). The use wear on two retouched blades suggests sawing of an undetermined hard material, in one case with a strong abrasive component (figs 75.8, 12; 76.2; 78.21). The remain-

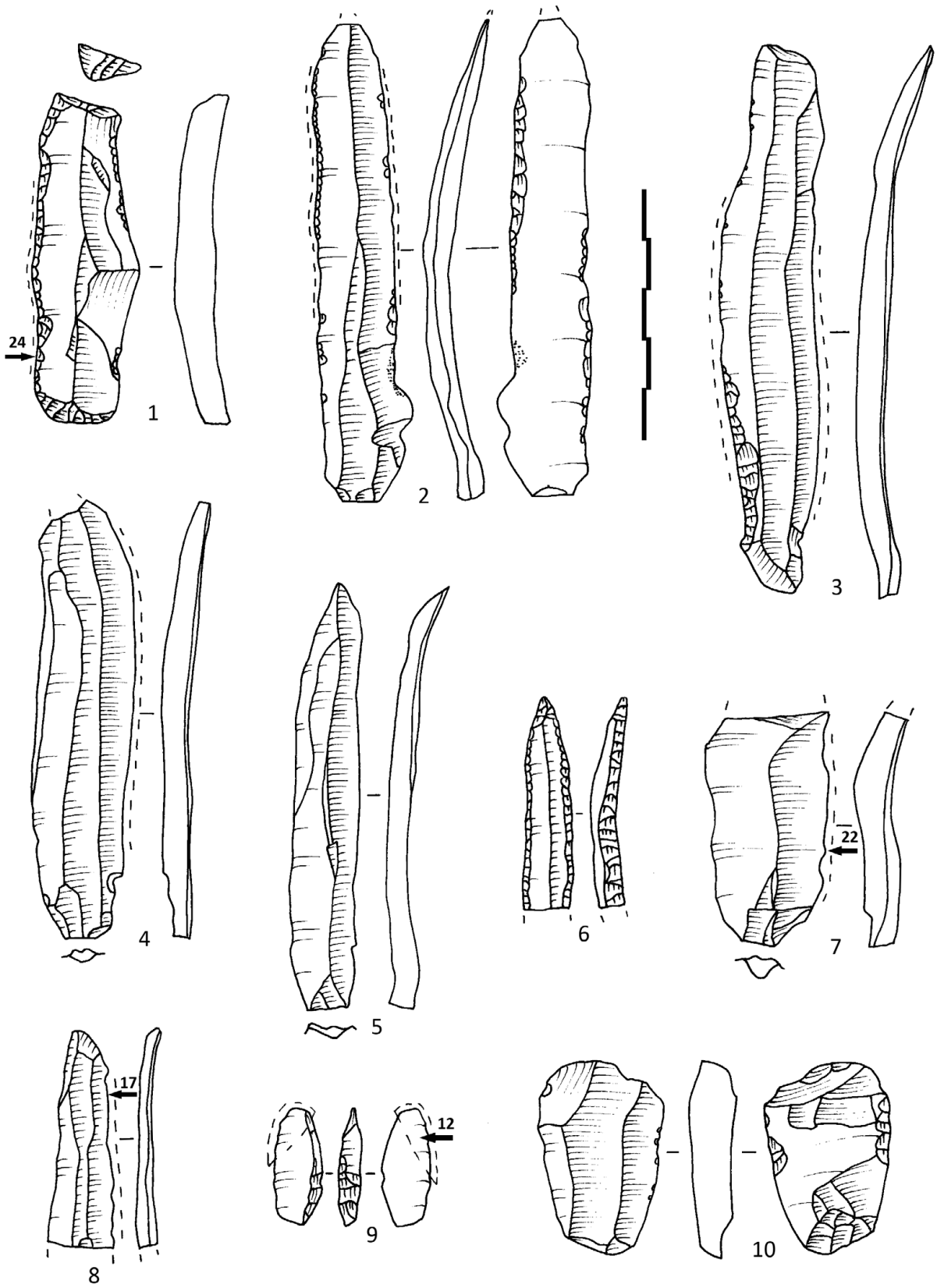


Fig. 74. Flint artefacts from Dzhulyunitsa II: tools (1–3, 6, 9–10), blades (4–5, 7–8). Used edges are marked by dashed lines; the arrows show photomicrographs in figs 77–78

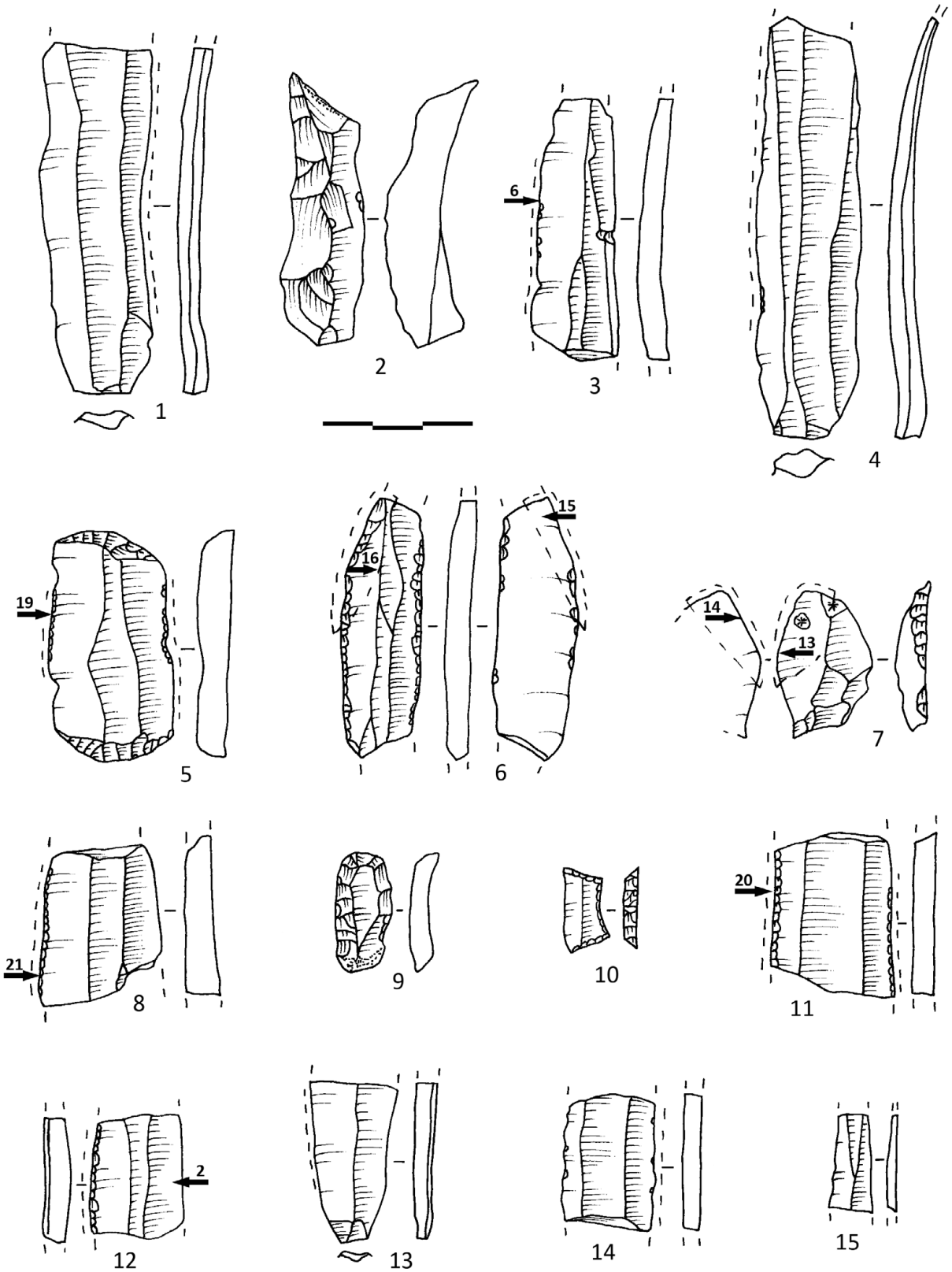


Fig. 75. Flint artefacts from Dzhulyunitsa II: tools (5–12) and blades (1–4; 13–15). Used edges are marked by dashed lines; the arrows show photomicrographs in figs 76–78

ing functions were fulfilled by retouched blades, as follows: sawing wood, cutting plants, cutting meat/fresh hide (fig. 74.3), and working Si-rich material (pottery clay?) (figs 74.1; 78.24). A retouched blade was used in two operations: sawing bone (right edge) and cutting plants (left edge) (fig. 74.2);

- Used blades (n=34): like the assemblage from phase I, the most frequent use relates to butchering – 10 blades were involved with mainly unilateral utilization (figs 73.4; 75.3). Eight blades display weak polish, which was difficult to identify, and they are considered to have been used for soft material treatment (fig. 73.4); one of these blade has local ventral recent damage near the used edge (figs 73.7; 76.1, 3). Five blades were involved in hide-processing: four for cutting hide (fig. 75.1, 4) and one for cutting and piercing hide (fig. 73.9). Cutting plants is attested on three blades (fig. 12.6). Three blades were used for hard material treatment (figs 73.10; 75.13–14). Sawing bone was detected on two blades; two other blades were used for sawing wood (figs 75.3; 76.6) and working soft stone (figs 74.7; 78.22). Surprisingly, no blades were used as sickle inserts, and only one blade shows relict cereal polish and was additionally abraded by hard abrasive material (figs 74.8; 78.17).

General observations

Several important observations can be made about the structure of the flint assemblages from Dzhulyunitsa I and II in a diachronic perspective, given that the assemblages represent only a fragment of the lifestyle of the first farmers in a very large settlement, with only a small portion explored. The observations will be presented following a diacritic *chaîne opératoire*.

The raw material varieties illustrated in fig. 63 are recognizable from the earliest Early Neolithic strata (phase I). Very few quartzite artefacts are attested: 12 in Dzhulyunitsa I and 9 in Dzhulyunitsa II; two obsidian artefacts, and two pieces (one per phase) of rock crystal are also notable. Two types of raw material predominate. Balkan flint with its varieties (easily distinguishable macroscopically) and the (dark-)grey, white-spotted flint. They occur in similar proportions in Dzhulyuinitsa I and II.

Nevertheless, in Dzhulyunitsa I, in the trenches excavated in 2002–2004, grey flint predominated among flakes and fragments, and was proportionally more common than Balkan flints among the blades and tools. It is worth noting that both raw material types are represented among all categories of artefacts – from cores to typological tools and varia. The most representative large cores are of the grey flint variety (figs 64.1–2; 72.1–2; 73.1), but exhausted Balkan flint flake cores are more numerous, as well as the fragment of a prismatic blade core (fig. 73.2). There are representative series of blades of both flint types, but with a slight prevalence of Balkan flint (figs 65–68). As for the formal tools (in their techno-typological and functional aspects), despite their scarcity, both Balkan flint (figs 70.3; 74.6) and dark-grey flint (figs 73.3; 75.6) are represented.

The small number of **cores** (15) and cortical flakes (20% of all flakes) does not suggest intensive core preparation and maintenance (workshop) at a some particular place on the site. However, the largest blade and series of blades, and the double-platform (naviform-like) blade core from Dzhulyunitsa I indicate on-site knapping on some scale. It would be speculative to propose household-specific blade production, but the blade *chaîne opératoire* is recognizable and relates to the subsequent fashioning of blades into typological tools. Well represented (and on a larger scale) is the flake-based expedient industry.

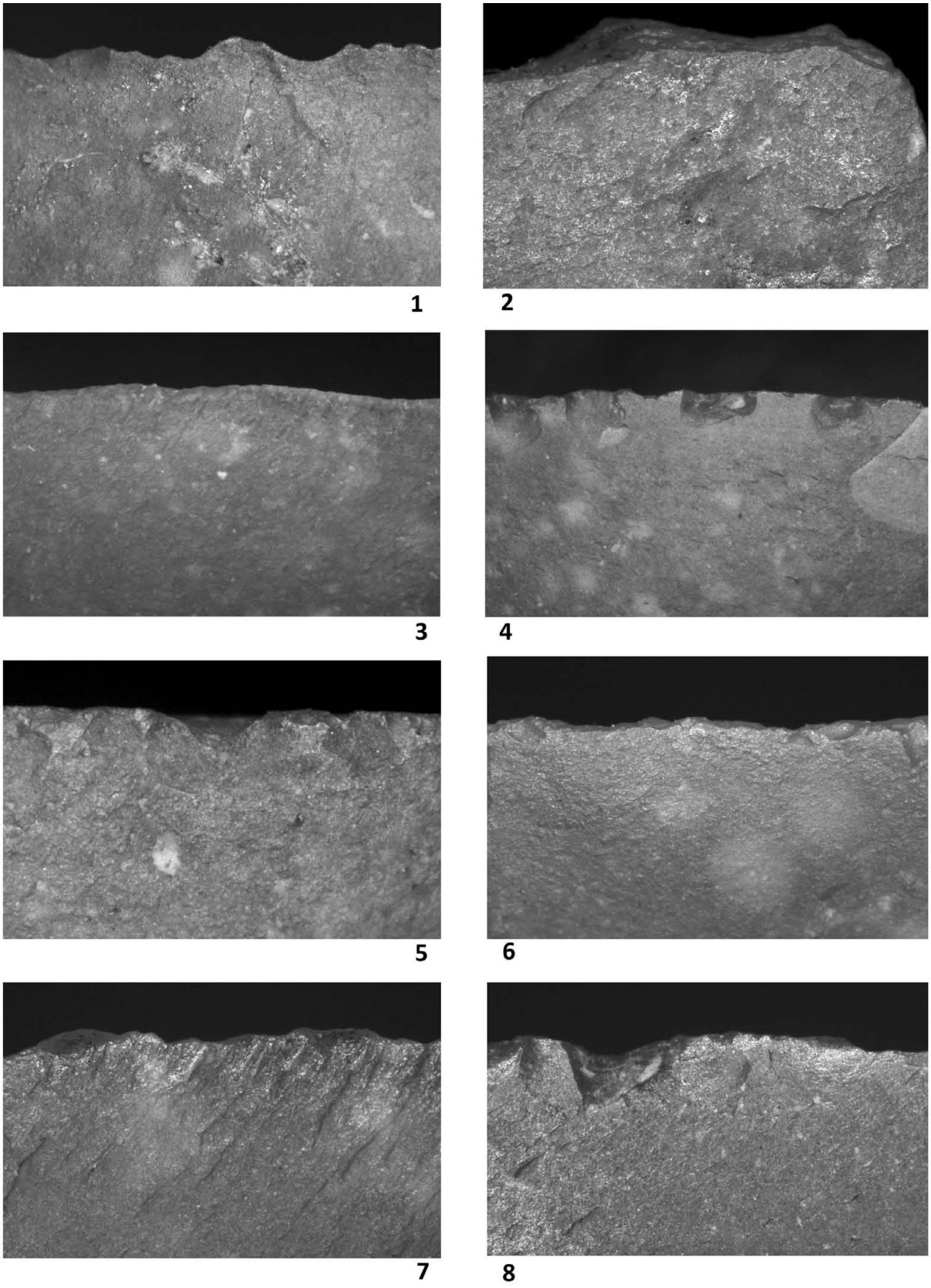


Fig. 76. Photomicrographs (x100 except 1, 3, 4 – x 80) of artefacts in figs 70–71, 73, 75. Virgin edge (3), PDSM (1–2), uncertain use (4); beginning of use (5–8)

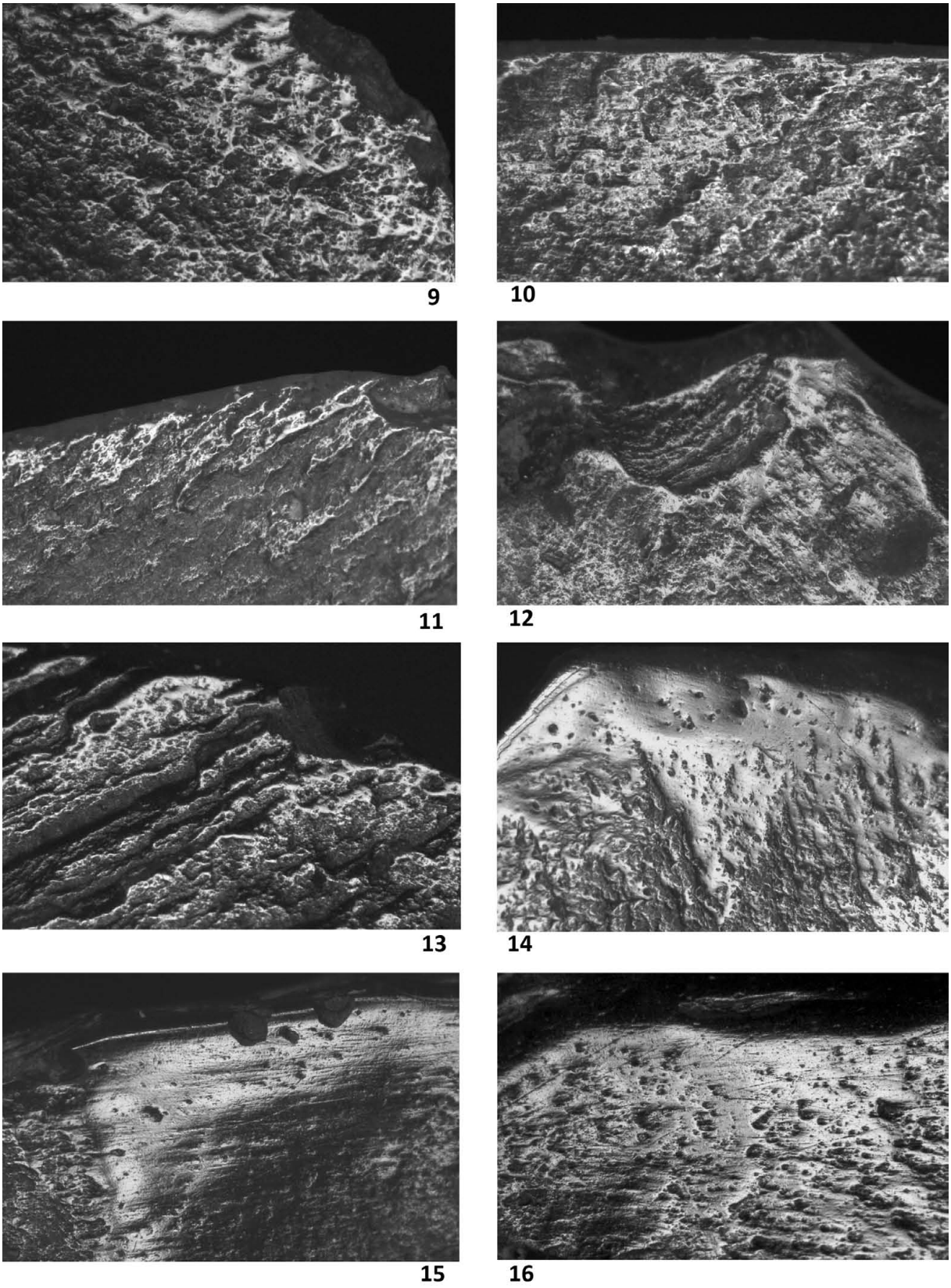


Fig. 77. Photomicrographs (x100) of artefacts in figs 71, 74–75. Cereal polishes of artefacts used as sickle inserts

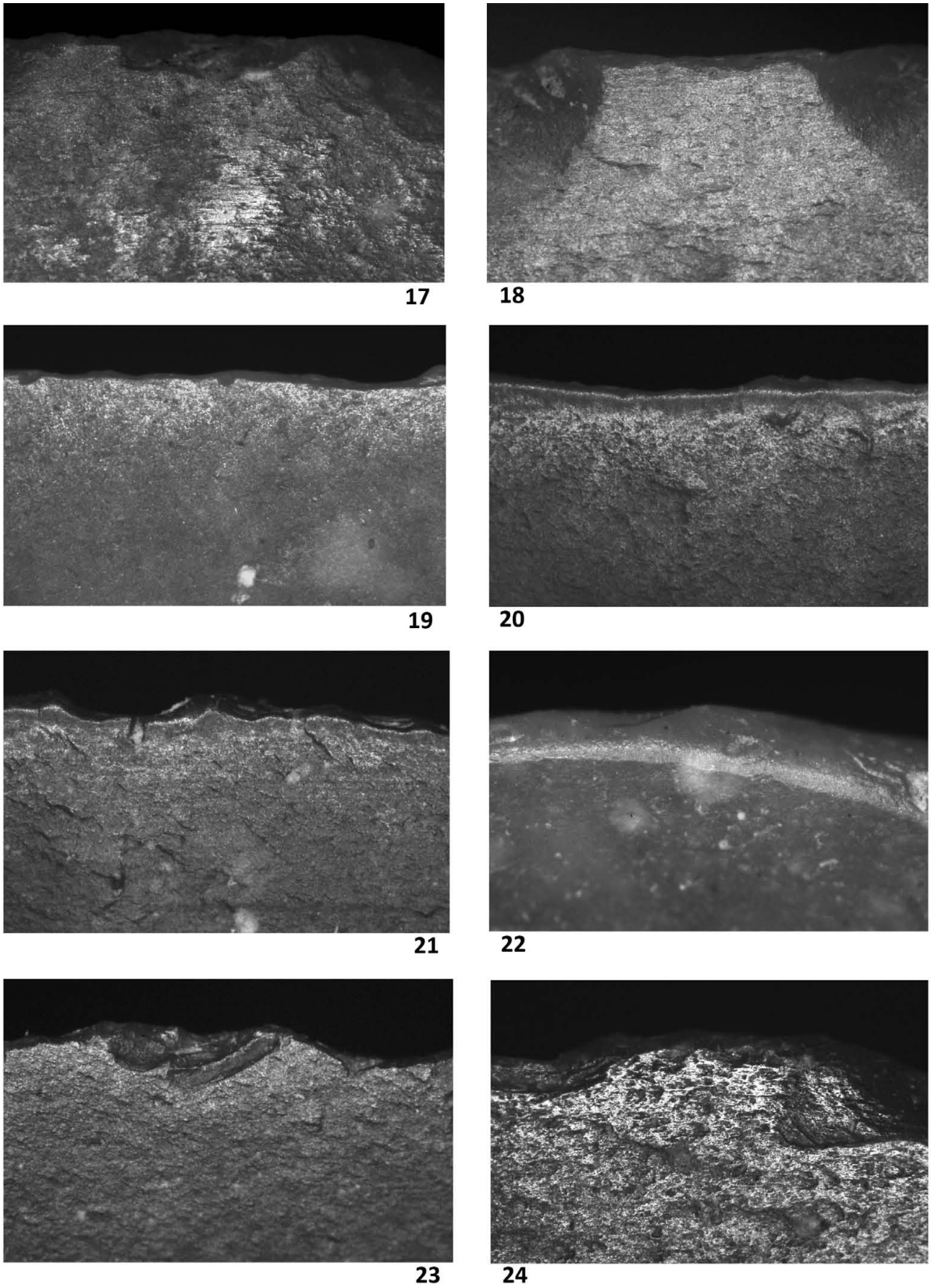


Fig. 78. Photomicrographs (x100) of artefacts in figs 73–75. Relict/abraded cereal polish by undetermined reutilization (17), dry hide (18), soaked bone (?) (19–20), hard abrasive material (21), soft stone (22), bone (23), silica-rich plants (24)

The typological tools from both phases vary in number and slightly in range: burins and notched blades are present only in phase I, while perforators and combined tools occur only in phase II (Table 4). Noteworthy are the trapezes, which, despite their scarcity, bring the Dzhulyunitsa assemblages closer to those of the Early Neolithic sites of Kovachevo, Yabalkovo and Ohoden (Златева-Узунова 2025; Zlateva-Uzunova 2009; Gurova 2017b). It is beyond the scope of this study to discuss in detail the techno-typological and contextual parameters of the Early Neolithic geometric microliths from Bulgaria and their origin. For the moment, the trapezes from Dzhulyunitsa could be considered the earliest and so, possibly, a direct proxy for their pre-Neolithic '*milieu favourable*'.

The dominance of retouched blades in both phases is expected, but the high and equal numbers of retouched flakes, endscrapers, and splintered pieces are surprising. The tool repertoire as a whole is strikingly different from those of the emblematic Early Neolithic sites in south Bulgaria, belonging to the Karanovo I cultural milieu (Gurova 2008a; 2012b; 2014a; 2018b). The main difference lies in the scarcity of formal tools among the Dzhulyunitsa assemblages. For comparisons with other Early Neolithic tool repertoires from north Bulgaria, two assemblages are available – those from Yarlovitsa and Varbitsa (Case studies nos 1, 3). The assemblages differ significantly in the number of tools, but in all assemblages retouched blades prevail (with very few formal tools); among the less numerous groups are endscrapers, splintered pieces, truncations, perforators, etc. The closest similarity (at least formally) to the Dzhulyunitsa tool repertoire is shown by the tool component of the Ohoden flint industry (Zlateva-Uzunova 2009, 66, Table 19). Unfortunately, there has been no opportunity to compare the assemblages from Dhulyunitsa phases I and II with the tool repertoire from the most similar site culturally (based on the pottery), Koprivets. My opinion of Koprivets in this context has been formulated in publication (Gurova 2018b, 123–124), with comments on previous statements about the Koprivets assemblage (Tsonev 2000).

Table 10

Tool category	DZH I	DZH II	Total
Retouched blades	8	20	**28**
Retouched flakes	2	9	**11**
Endscrapers on blades		7	**7**
Endscraoers on flakes	2	2	**4**
Truncated blades	2	-	**2**
Splintered pieces	4	7	**11**
Trapezes	2	1	**3**
Burins	1	-	**1**
Notched blade	1	-	**1**
Perforators/ borers	-	1	**1**
Combined tool	-	1	**1**
Tool fragments	2	1	**3**
Total	**24**	**49**	**73**

Table 10. Tool categories by phases

The **functional connotations** of the artefacts in terms of subsistence activity suggest that livestock and animal products and sub-products were more important (or as important) compared to crop husbandry (Table 11). This balance in the functional attribution of artefacts is reflected in zooarchaeological data, suggesting the prominence of domestic animals, particularly cattle, with an emphasis on cattle herding (Kamjan et al. 2021).

Table 11

Worked material	DZH I	DZH II	Total
Cereals	5	4	**9**
Other plants	6	4	**10**
Wood	-	2	**2**
Bone	2	6	**8**
Hide	1	7	**8**
Meat/fresh hide	10	11	**21**
Si-rich material	-	1	**1**
Soft stone	-	1	**1**
Combined function	-	1	**1**
Undetermined hard material	2	4	**6**
Undetermined soft material	5	8	**13**
Total	**31**	**49**	**80**

Table 11. Worked materials by phases

There are no published analyses of fish remains from the earliest strata of Dzhulyunitsa. Fishing is a likely activity given the site's proximity to the Yantra River and its tributaries, and among microtraces on some used implements are those (fig. 78.20 for ex.) resembling experimental and archaeological implements linked to fish processing (Soares et al. 2016, 257, fig. 8; Clemente-Conte et al. 2020, 145, fig. 2; 147, fig. 5). More analyses are needed to test this hypothesis.

Agriculture and cereal harvesting, as important economic activities, are underrepresented in the use-wear results, despite the archaeobotanical evidence from Dzhulyunitsa I and II. Various crops are attested with a prevalence of barley (*Hordeum vulgare*), in contrast to Early Neolithic sites in south Bulgaria ... "where hulled wheats (einkorn and emmer) have a leading role" (Marinova, Krauss 2014, 182, Table 1, 184). Sickle inserts are few at Dzhulyunitsa, a surprising finding that was previously highlighted by the author (Gurova 2012b, 8). Nevertheless, the sickle inserts suggest the use of the well-known Karanovo I type of sickle with obliquely inserted elements, which was a basic agricultural tool in Bulgaria and beyond – in the broader Balkan Early Neolithic *oikoumene* (Gurova 2006; 2018a). Everyday household processing included various activities related to butchering and food processing. Many utilized implements in the Dzhulyunitsa assemblages were used in this context, as described in the previous section. Given the provisional nature of the current results, the data in Table 11 suggest a slight decrease in cereal/plant processing and an increase in secondary animal product processing from phase I to phase II.

Very few Early Neolithic sites are published in a way that allows comprehensive comparison between the flint assemblages. Often, functional analysis of the artefacts is lacking. In this respect, the assemblages from Ilıpınar and Menteşe[1] are suitable for comparison with Dzhulyunitsa I and II. Apart from differences in the typological repertoire, there are obvious similarities in the technologically evolved blade production; the prevalence of animal product processing among the used implements (despite the strong representation of sickle elements within the assemblage from the Marmara region) (Gurova 2001; 2006).

Dzhulyunitsa in the Neolithization debate: discussion and conclusions

Several points (some presented in previous sections of the text) should be emphasized in the context of the following discussion:

1. Dzhulyunitsa has the earliest dates of establishment of any Bulgarian Early Neolithic site which "… is currently proving to be a key site in determining the characteristics of the earliest Neolithic within the Balkans" (Krauss 2023, 141). The site belongs to the pre-Karanovo I complex in northern Bulgaria, which Neolithization follows the trajectory of the Sub-Mediterranean-Aegean vegetation zone during the 8.2 ka event (Krauss et al. 2017; Krauss 2023, fig. 63);

2. The Dzhulyunitsa I and II pottery assemblages show closer parallels not with the Starčevo cultural complex (as for other Early Neolithic sites in central-north and northwest Bulgaria) but with sites in Anatolia, with the strongest affiliations to sites from western Anatolia and the Marmara region (*vide supra*);

3. Archaeobotanical evidence from Early Neolithic sites in northeast Bulgaria shows similar crop compositions to those in Early Neolithic Thessaly and Anatolia. The peculiarity of the northeast cluster of sites lies in the fact that, unlike the Thracian sites where *Triticum* varieties prevail, here the most important was *Hordeum*. In the forest-steppe landscape, the earliest sites were established in more open (less forested) areas with better conditions for farming and pasturage (Marinova, Krauss 2014, 191);

4. The Dzhulyunitsa archaeozoological assemblage shows similarities in taxonomic composition (prevalence of cattle and underrepresentation of pigs) with three sites in the Marmara region (Barçin, Fikirtepe and Menteşe) (Atici et al. 2017, 12, 14, fig. 7; Kamjan et al. 2021). Additionally, it has been clearly stated that the regions with limited interactions with pigs (suids) during Neolithization "...are along the Continental Route (Central Anatolia, via the Marmara Region, the eastern and northern Balkans)" (Groene et al. 2018, 45).

5. For the past decade, I have expressed my opinion on the role of Dzhulyunitsa in the spread of the Neolithic from the Anatolian homeland and its subsequent role in lithic raw material (Balkan flint) procurement and distribution south to the pre- and earliest Karanovo culture province (Gurova 2012a, 41; 2012b, 19; Gurova, Bonsall 2014a, 122–123). The working hypothesis (still more theoretically and intuitively than empirically) can be summarized as follows: i) the Dzhulyunitsa inhabitants and the pre-Karanovo substratum in general founded settlements in northeast Bulgaria after their expansion from northwest Anatolia via the Bosporus and along the Black Sea coastline ca 6400 BC (Özdoğan 2006; 2011a–b); ii) the movement west from the sea coast inland may have been prompted by a search for the best land for farming and acquisition of suitable raw material for flint knapping. Most likely, the migrants reached the sources of high-quality Balkan flint (like) raw material in the Shumen cluster, and they would

1 The assemblage from Menteşe was studied by the author but remain unpublished

have known of the dark-grey flint with numerous secondary deposits in the catchment of the Rusenski Lom River. Dzhulyunitsa lies 20 km from the Lozen source of dark flint, 60 km from the Shumen outcrops cluster, and 80 to 100 km respectively from the Pleven–Nikopol cluster of Balkan flints outcrops and could serve (as hypothesized) as a mediating site in the distribution of raw material nodules from flint outcrops in northern Bulgaria and consumption sites of the Karanovo I–II cultures in Thrace (cf. Gurova et al. 2022b, 25). This network has certainly been known and used by the putative Mesolithic/pre-Neolithic communities living most likely near the Danube and its tributaries (as suggested by Gurova, Bonsall 2014b); iii) bearing the technological know-how of blade manufacture from the Marmara region (an observation based on the Ilıpınar and Menteşe inventories) they could advance successfully in blade production in some still unknown workshops near the outcrops or the settlement. Assuming there was pre-Neolithic procurement and distribution of Balkan flint (the best sources of which are located in the Pleven–Nikopol cluster/region) the settlers of Dzhulyunitsa could decide to incorporate blade production in the network of regional and supra-regional exchange of goods; iv) being not particularly interested in the fashioning and use of formal tools, the flint workers from Dzhulyunitsa may have decided to focus their efforts on knapping for subsequent circulation of Balkan flint artefacts (most likely series of blades) to the (pre-?)Karanovo I enclaves in Thrace, which seemingly became the primary consumers of the flint production from north Bulgaria.

This hypothesis, and the many additional arguments presented in the previously cited publications (including the new insight brought by genetic studies – see Gurova 2018b, 136–137), seems even more relevant to me now, after studying the representative flint assemblages of the Dzhulyunitsa I and II inhabitants. Further research on flint assemblages from Early Neolithic sites in north Bulgaria and interdisciplinary analyses of raw material provenance and distribution will undoubtedly contribute to more robust and detailed scenarios and conceptualization of Neolithization.

1.3. CASE STUDY NO. 3: FLINT ASSEMBLAGE FROM YARLOVITSA

Introduction

The archaeological site of Yarlovitsa (near the village of Yarlovitsa, municipality of Dimovo, Vidin district, northwestern Bulgaria) was investigated in two stages in 2019, as part of the infrastructure project during the expansion of the gas transmission infrastructure of Bulgartransgaz EAD parallel to the northern (primary) "Balkan Stream" gas pipeline route to the Bulgarian–Serbian border, i.e., the territories of Montana and (mainly) Vidin district. During the same infrastructure project, several other archaeological sites were investigated in 2019–2020. From east to west, these were: Rasovo (Ivanov et al. 2020), Yarlovitsa (Todorov et al. 2020; Vasileva et al. 2021), Gramada (Alexandrov et al. 2020), Brankovtsi (Kecheva et al. 2020), and Kosta Perchevo (Georgiev et al. 2020). They were recorded during extensive field surveys in 2012 (Бояджиев, Марков 2013; Кечева 2013) and 2019 (Alexandrov et al. 2019). The site of Brankovtsi (located ca 30 km northwest of Yarlovitsa) is presented as Case study no. 8.

The archaeological investigations at Yarlovitsa revealed a single-layer site which lies on a high overflow terrace on the left bank of the Mechkobor River, a tributary of the Skomlya River, which flows into the Danube. The northern part of the site lies in arable land on nearly level terrain, while the southern part is situated on a steep slope leading down to the river. The northern section was initially investigated through 31 trenches. The main excavations were carried out on the cleared slope, which was divided into sectors (Todorov et al. 2020, fig. 1).

The site is characterized by sloping terrain and poorly preserved pottery, which makes interpretation difficult. The pottery is highly fragmented, with a destroyed surface and smoothed edges. The rare decoration features an embossed edge with small pits and an embossed rosette. The pottery assemblage is considered to resemble that from Ohoden, which is assigned to the Starčevo IIв phase (Todorov et al. 2020, 220). Probably during this period, a settlement existed on the habitable overflow terrace, the remains of which were destroyed in antiquity and buried under later deposits. Most likely, the few structures uncovered belong to the settlement's periphery. The flint assemblage is rich and representative but, unfortunately, it is re-deposited on the slope and thus deprived of its primary context, occurring in a layer of brown-black soil (Todorov et al. 2020, fig. 2). Despite this gnoseological disadvantage, the assemblage deserves to be presented because of its significance in at least two important aspects: raw material and typological repertoire.

The flint assemblage from Yarlovitsa comprises 974 artefacts, coming from trenches and sectors unattributed to specific features. The secondary contextual data refers to various taphonomic factors that led to the complete redistribution of artefacts. This is why the assemblage is treated as a whole, with an attempt to reveal its significant characteristics without speculating on spatial and temporal (eventually diachronic) patterns.

The general structure of the assemblage according to techno-typological differentiation is presented in Table 12, convincingly showing the solid prevalence of debitage products and numerous cores, which is, in general, unusual for Early Neolithic assemblages.

Table 12

Entire assemblage	Tools	Blades	Flakes	Fragments	Cores	Varia	Total
Total	**84**	**177**	**310**	**355**	**25**	**23**	**974**

Table 12. General structure of the assemblage by techno-typological categories

Following the routine procedure, the assemblage was analysed, focusing on the following points: i) raw materials and supply system; ii) techno-typological characteristics of the artefacts; iii) functional connotation, based on use-wear analysis of selected artefacts.

Raw materials: characteristics and procurement strategies (figs 79–85)

The abundance of Balkan-like flint among assemblages of newly discovered and excavated Neolithic sites in northwestern Bulgaria (*vide supra*) represented a surprise and challenge because the archaeological sites are located in a Neogene rock sequence that is devoid of flints except the limited unit of the Upper Jurassic–Lower Cretaceous carbonate sediments of the West Balkan Carbonate Group, which contains flint concretions (Angelov et al. 2006; Gurova et al. 2021b, fig. 4.1). This situation provided a particular motivation to fulfil a field survey for raw material identification. The field prospections and associated analytical work were carried out in 2020 with the following purposes: i) identifying flint raw material outcrops in the region; ii) collecting suitable raw material samples from discovered outcrops and flint artefacts from newly excavated archaeological sites; iii) integrated laboratory analyses of the samples (micropetrography and geochemistry) using the innovative and methodologically relevant approach of combining micropetrography with trace element analysis; iv) GIS analysis and predictions (least-cost path models) of a possible raw material procurement system, based on similarities between samples from different archaeological sites and flint outcrops. The results of this investigation were published in 2021 as a preliminary paper (Gurova et al. 2021a) and as a complete publication representing another case study of a multi-scalar characterization of the flint raw materials from north Bulgaria – identified, documented and published – with an additional GIS component, shedding light on raw material distribution patterns, based on landscape and environmental data (Gurova et al. 2021b).

One of the goals was to check if a Balkan flint source(s) could be found in northwest Bulgaria among Upper Jurassic Formations, or whether the Neolithic population procured their flint from known Balkan flint outcrops 100–200 km away, in the Pleven–Nikopol region, where two main clusters of Balkan flint outcrops are located (see Gurova et al. 2016, fig. 1). We collected eight samples of raw materials from four primary and two secondary flint outcrops (Gara Oreshets quarries, Replyana and Granitovo) and 22 artefacts from the sites (mostly Neolithic), mentioned in the Introduction (Gurova et al. 2021b, figs 5–10, Table 1).

The assemblage from Yarlovitsa gave the general impression of being dominated by macroscopic varieties of Balkan flint. At the first stage of my study, five artefacts (identified visually as Balkan flint) were selected from the inventoried pieces. They were analysed micropetrographically, indicating their affinity with previously studied Balkan flint samples from Pleven–Nikopol outcrops (Todorov et al. 2020, 220). They were subsequently included in the specialized multidisciplinary study of the artefacts and raw materials from northwest Bulgaria, which is now discussed in more detail (Gurova et al. 2021b; figs 14–15).

It is noteworthy that after the excavation of Yarlovitsa in 2019, in 2020 the remains of a part of the same Neolithic site were recorded on the right bank of the Mechkobor River. The site was named Yarlovitsa 2 to distinguish it from the main site, published as Yarlovitsa (Yarlovitsa 1) in the discussed paper (ibid., Table 1). Thus, the assemblage from Yarlovitsa was included in the multiproxy analysis with six artefacts (samples S18–23), plus two additional pieces taken from the area of Yarlovitsa 2 (samples S12–13), and four of the previously studied items (Gurova et al. 2021b, figs 5.4–5; 6.1–6).



Fig. 79. Colouristic varieties of Balkan flint recorded within typological tools

Two groups of flint samples were distinguished, based on the micropetrographic and geochemical data: the first group included flints from all local outcrops and some artefacts, among which was one from Yarlovitsa 2 (Gurova et al. 2021b, fig. 5.4). All raw materials originated from Upper Jurassic–Lower Cretaceous limestones of the West Balkan Carbonate Group. The second group consists only of flint artefacts from all the mentioned sites, the flints originating mostly from "bioclastic limestones and exhibit some petrographic and geochemical similarities



Fig. 80. Blades (including retouched) of Balkan flint

with Upper Cretaceous Balkan flint (raw material and artefacts) from previously studied localities near the town of Nikopol (Zhernov, Danube, Mouselievo, Osam, Ali Koch Baba)" (Gurova et al. 2021b, 250). These raw materials belong to the Mezdra siliceous-carbonate Formation (cf. Gurova et al. 2016) and could be considered as long-distance in terms of provenance and procurement. (Gurova et al. 2021b, 249–252). It should be stressed that among this second group of flint, the best represented were the samples from the site of Yarlovitsa.



Fig. 81. Blades (including retouched) of Balkan flint with one piece of black exotic flint

GIS analysis based on similarities between the artefacts and the geological samples yielded least-cost path models for the distribution of raw materials between sources and consumer sites. Concerning Yarlovitsa, two applicable models suggest: i) a distance for local raw material acquisition, Yarlovitsa – Oreshets – two possible paths between 16 and 19 km; ii) the distance to



Fig. 82. Blades and tools of Balkan flint with two artefacts of its 'grey variety' with uncertain provenance

the Balkan flint outcrops (Nikopol cluster), following two different path estimates is 160–200 km (Gurova et al. 2021b, 255, figs 18–19).

Most of the artefacts from the Yarlovitsa assemblage belong to the typical Balkan flint (colouristic) variety, suggesting that the site was part of the distribution network for Balkan flint, sourced from the Pleven–Nikopol area. This network would have been supra-regional, requiring a well-developed strategy for procuring the preferred raw material, particularly from the outcrop cluster around Nikopol.

Additional confirmation of these results came from a later study of 77 artefacts from 10 Neolithic (mainly Early Neolithic) sites and several new raw materials (Gurova et al. 2022b). Six new samples from Yarlovitsa were analysed using the combined laboratory analytical procedure described above. The results showed that all samples belonging to flint group I have

similar petrographic and geochemical profiles to the Balkan flint raw materials from the Upper Cretaceous Mezdra siliceous-carbonate Formation in the Pleven–Nikopol area (Gortalovo 1 and 2; Bohot Lake B, Zhernov 1, 2A, 2B, Danube A, B) (Gurova et al. 2022b, 18, figs 3.2; 11.1). The new GIS estimates suggest provisioning of Balkan flint for the Yarlovitsa community from the Nikopol cluster at a distance of ca 168 km (ibid., Table 2, fig. 15). An interesting detail is that an artefact from Yarlovitsa shows a clear bicolour aspect, confirming nuances in the Balkan flint, including yellow-brownish, beige and light grey with white spots. Such nuances are also documented from some primary outcrops such as Girtalovo and Muselievo (ibid., fig. 6). The unambiguous match of Balkan flint artefacts from Yarlovitsa with the securely identified Balkan flint outcrops in the Pleven–Nikopol cluster could be characterized as secure and obvious, allowing acceptable confidence in the macroscopic distinction of non-analysed artefacts that are visually identical to proven Balkan flint.

Significantly, Balkan flint prevails across all techno-typological groups of artefacts in the Yarlovitsa assemblage, as shown in figures 79–83. There is, however, a trend to using small nodules/concretions of the local (Oreshets type) flint for flake debitage in the context of an expedient industry (figs 84.A; 85). As for the Balkan flint *chaîne opératoire*, it was most likely introduced via ready-made blanks and prepared cores, whose initial stage (*mise en forme*) is virtually absent, but whose exhaustion and reuse on the site is apparent. No Balkan flint nodules or concretions are recorded; there are 3 massive flakes of Balkan flint with traces of secondary debitage, suggesting once again the precious value of this material.

The importance of imported Balkan flint in the everyday life of the site's inhabitants is underlined below, showing the proportion of Balkan flint artefacts within the typological repertoire and the pieces used for subsistence and household activities (see Tables 13–14 below).

Techno-typological analysis

The imbalance between the techno-typological groups (Table 12) is obvious: debitage products account for 86.4% of the assemblage, while tools account for 8.6%. The techno-typological description and analysis are based on the following differentiation:

- typological tools (n=84);
- debitage products (n=842) consisting of:
    a) blades (all fragmented) (n=177);
    b) flakes (only entire pieces) (n=310);
    c) fragments (n=355) – distinguished as flake fragments (pieces with morphological parameters suggesting fragmented flakes, but without butts or proximal parts) and indeterminate fragments/chunks (in some studies, such pieces are termed debris).
- cores (n=25);
- varia (n=23).

Typological tools

The typological repertoire is quite rich, with a significant imbalance between the various groups, as shown in detail in Table 13. The presence of Balkan flint among the tools is noticeable, as demonstrated in figures 79–82. There is no differentiation of the other raw materials (apart from the Balkan flint) because they represent several flint (chert) types with unknown sources, and the tools made from the local Oreshets-type of flint are very few. To make a macroscopic description of flints without proper geological analyses is not appropriate in my understanding of raw material consideration and knowledge.

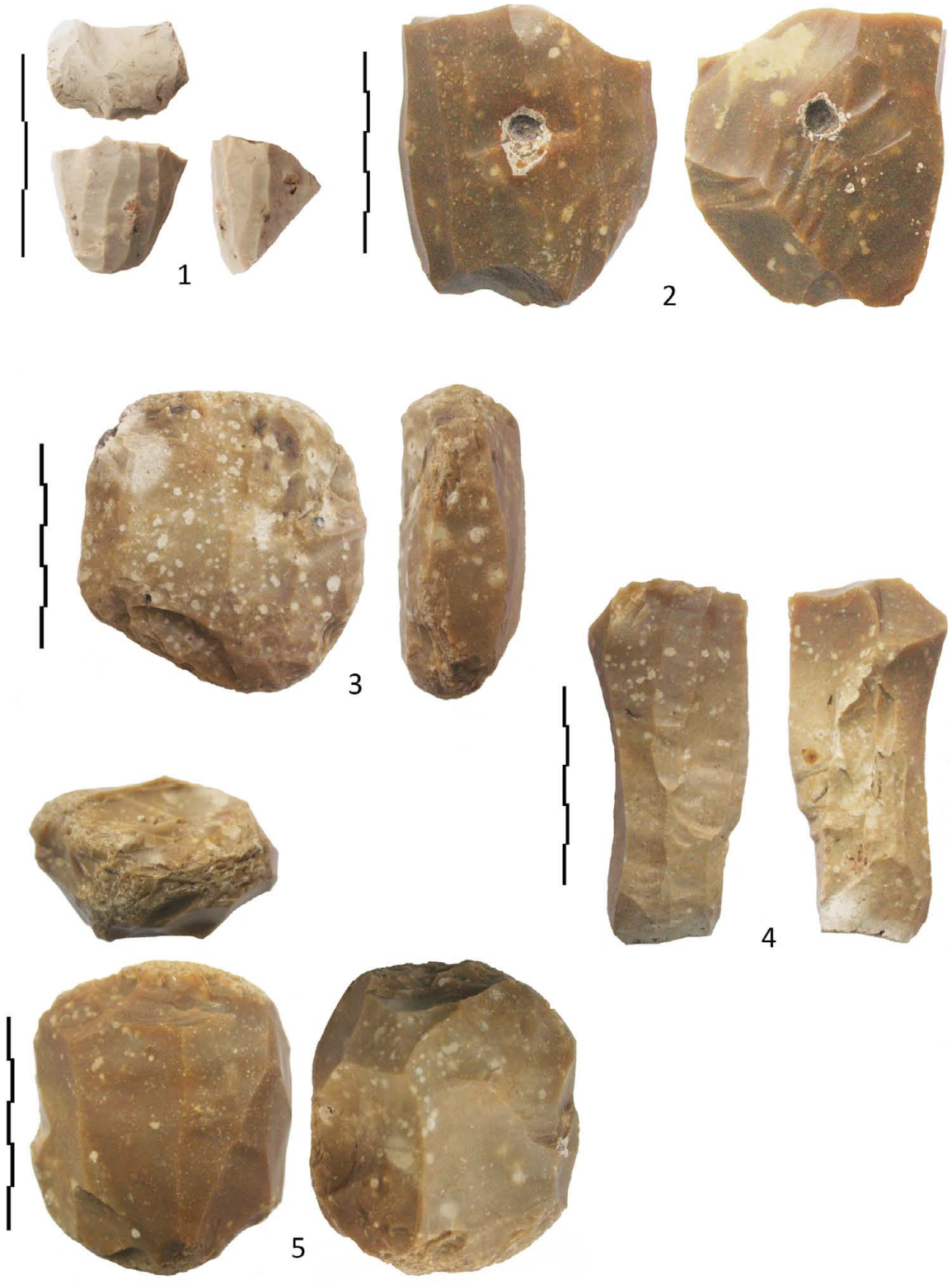


Fig. 83. Small bladelet core (1); Balkan flint cores (2–5); 3 and 5 – reused as hammerstones



Fig. 84. Pre-cores (A) and cores (B–D) for flakes; C3 – for bladelets; various raw materials: A – local flint; B–D – imported flint



Fig. 85. Nodules of local (Oreshets) raw material with testing exploitation scars (photos M. Gurova)

Table 13

Tool category	Balkan flint	Other flints	Total
Retouched blades x 1	10	5	**15**
Retouched blades x 2	12	1	**13**
Truncated blades	6	-	**6**
Endscrapers on blade	6	4	**10**
Endscrapers on flake	4	3	**7**
Perforators and borers	3	6	**9**
Retouched flakes	4	5	**9**
Splintered pieces	2	6	**8**
Truncated flakes	2	-	**2**
Burin	1	-	**1**
Notched blade	-	1	**1**
Fragment of tool	-	3	**3**
Total	**50**	**34**	**84**

Table 13. Tool categories by general raw materials

It is worth noting that in most groups, Balkan flint artefacts prevail, especially among tools on blades, particularly retouched and truncated blades. The opposite ratio is exhibited by the perforators and borers, retouched flakes, splintered pieces and fragments of tools, which are mostly made of other flint types. The preference for Balkan flint in tool manufacture is well demonstrated and was based on a *chaîne opératoire* involving a Balkan flint core-reduction system, blade production, and subsequent tool fashioning.

The retouched blades are the most numerous group, with a slight dominance of blades with unilateral retouch (ratio 15:13). There are no typical formal tools on blades with high steep retouch, which are characteristic of the Early Neolithic assemblages from the Karanovo I–II cultural milieu, even though there are series of blades with suitable morpho-metrical parameters suitable for such retouching (figs 86.2, 9; 87.1; 88.12). The retouch on the blades is mostly discontinuous, marginal to semi-steep, in some cases alternate (figs 87.2, 4, 8; 88.1, 3–5, 10). There is one interesting tool on the largest blade in the assemblage, with irregular bilateral retouch, which was *a posteriori* fragmented into two pieces with accidental pseudo-truncation and several scars made during the excavations (fig. 86.8). In some cases, there are blades with microscarring on the edge(s) that could be mistaken for intentional retouch, but the 'pseudo retouch' is due to utilization or some taphonomic alterations or just recent damage (see for ex., figs 86.9; 87. 5; 88.2, 9, 12). However, some confusion between microscarring and intentional retouching cannot be completely ruled out. All truncated blades (n=6) have oblique to straight distal fashioning. More intriguing are two flakes (one cortical) with double truncations, a tool type that is quite rare in the Bulgarian Early Neolithic industry (fig. 86.4, 6). Endscrapers are, in general, the second major group of tools after retouched blades. The endscrapers on blades (n=6) are dominant, with fronts ranging from convex/arched to quasi-straight, and most frequently with semi-steep retouch (fig. 89.3–4). The endscrapers on flakes (n=4) are very diverse

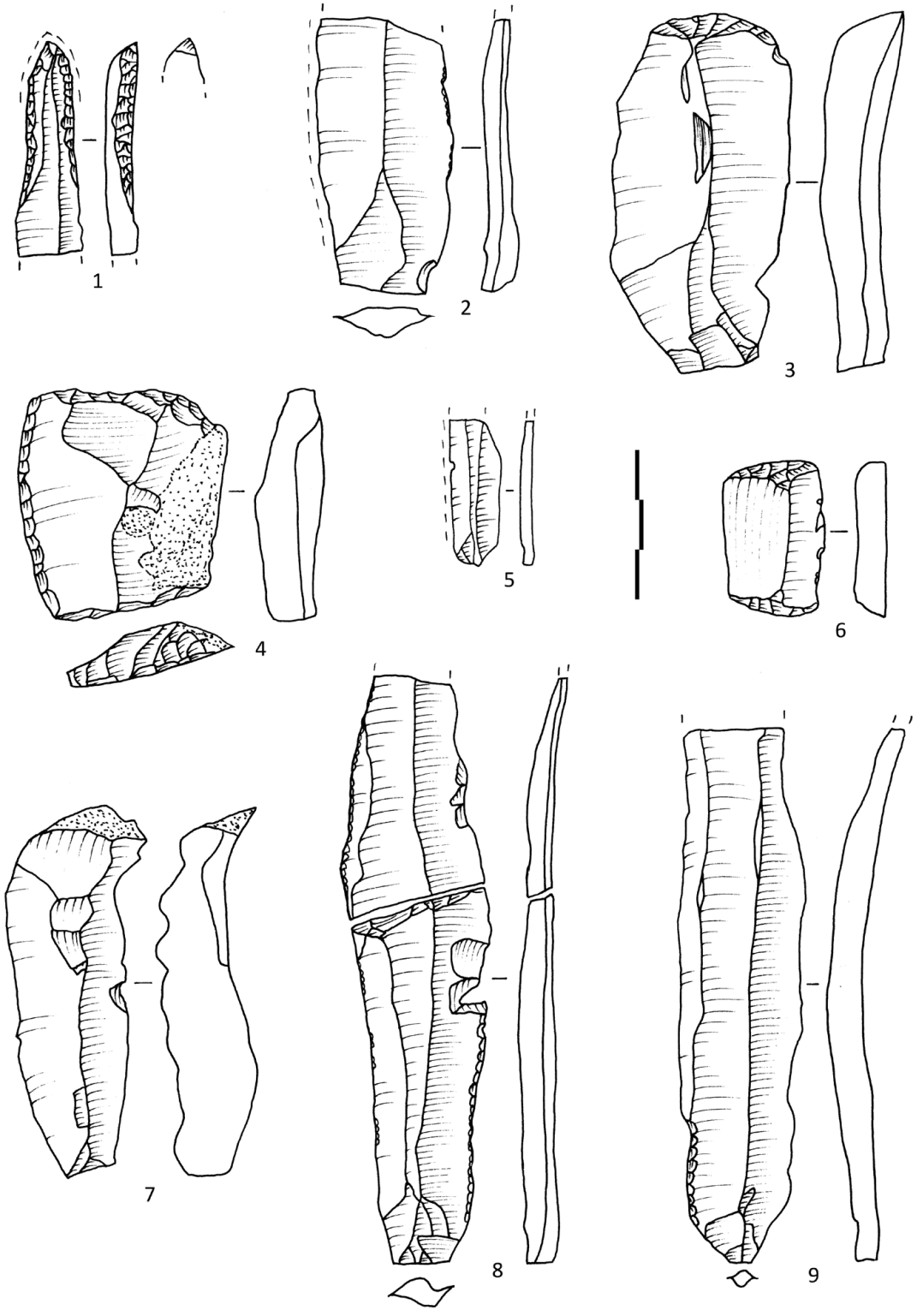


Fig. 86. Blades (2, 5, 7, 9) and typological tools (1, 3–4, 6, 8). Used edges are marked by dashed lines

in terms of shape, dimensions and retouching. Three of them are on rather large blanks – a massive blade-like flake (fig. 86.3), large flakes (fig. 89.5–6), and only one is on a small flake (fig. 89.9). The group of perforators and borers contains five perforators, three evident borers (figs 86.1; 87.6; 89.7), and one piece with a broken tip, which presumably fits better with borer morphology, but the preserved part is typologically a perforator (fig. 88.11). Three of them are on

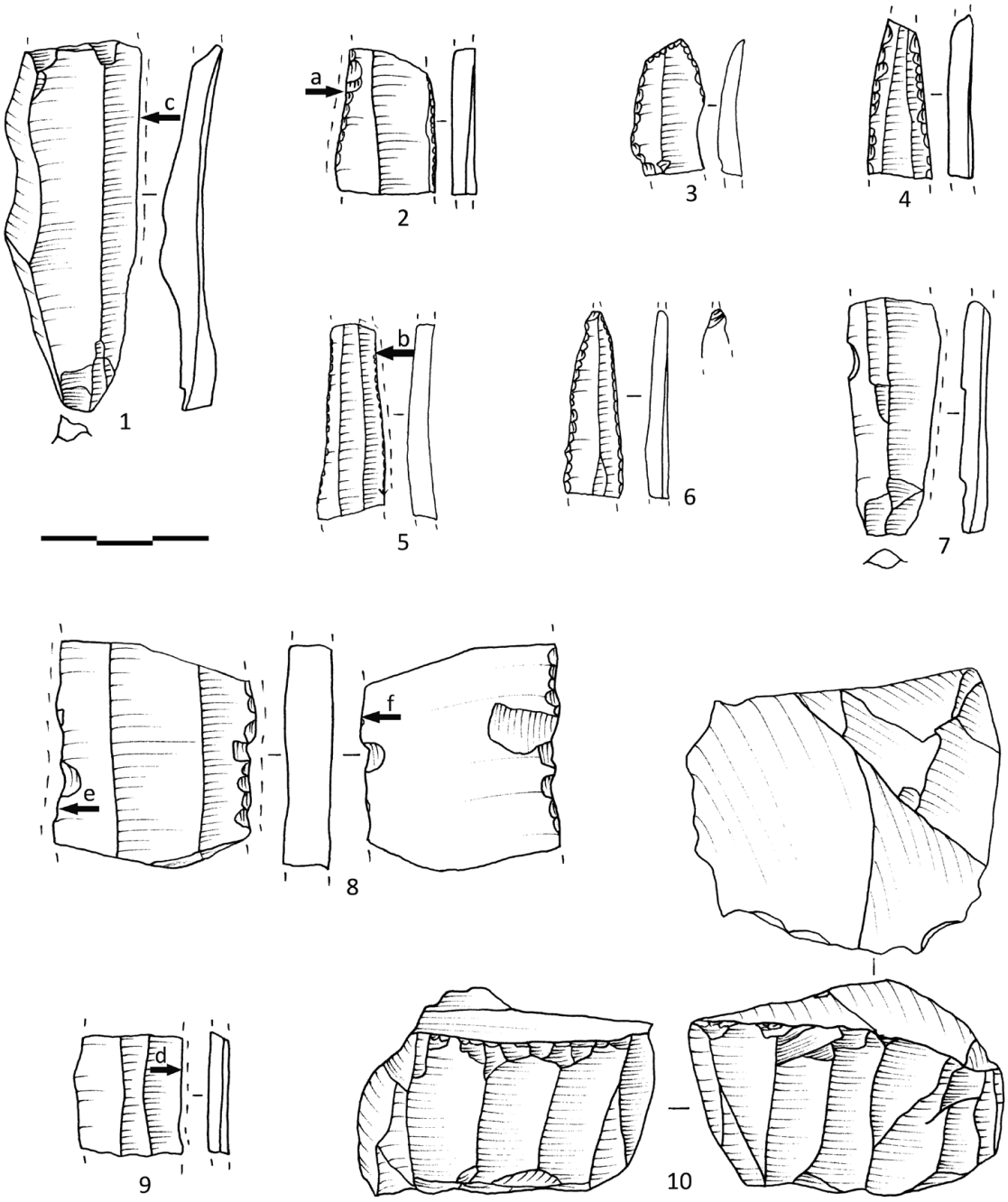


Fig. 87. Blades (1, 7, 9), core (10) and typological tools (2–6, 8). Used edges are marked by dashed lines; the arrows show photomicrographs in fig. 91

massive blades of Balkan flint (grey in one case) with high steep retouch, and they are affiliated with the known pointed Early Neolithic formal tools. The retouched flakes (n=9) possess discontinuous retouch on their lateral edges and vary in dimensions, shape and raw material. The splintered pieces are four on blades and four on flakes. Most of them are unipolar and bifacial. There are also single examples of a simple burin on a broken blade and a blade with a lateral notch (fig. 89.8). Fragmented tools (n=3) are undeterminable.

Debitage products

- blades (n=177) are represented by fragments: 60 proximal (figs 86.2, 5, 9; 87.1, 7; 88.8; 89.1–2); 85 mesial (figs 87.5, 9; 88.6–7, 12); 18 distal; and 14 entire blades (fig. 86.7). Techno-

logically, most blades indicate removal by the punch technique, based on the wide, flat butts of many of the proximal fragments and entire specimens (68 flat butts). It should be noted that the butts vary in shape and inclination, suggesting a lack of standardization and uniformity of the debitage technique used. However, the use of pressure blade detachment is inferred from the available blade microcore and a few fine, small blades and bladelets (figs 86.5; 90.1). There are 3 blades with partial cortex, including one plunging piece (fig. 86.7). The ratio of trapezoidal to triangular sections is 132:45, indicating an evolved stage of the core reduction sequence. The dimensions of the blades vary significantly: in length between 1.1 and 10.8 cm; in width between 0.5 and 3 cm; and in thickness between 0.2 and 0.8 cm. The largest blade in the assemblage is a proximal fragment with partial pseudo-retouch (recent damage) on the proximal part of the left edge; its dimensions are 10.8 x 2.6 x 0.7 cm (fig. 86.9);

- flakes (n=310) with a clear prevalence of pieces between 1.5 and 4 cm (n=243), followed by 28 items exceeding 6 cm in length; 20 flakes between 4 and 6 cm, and 19 small flakes (up to 1.5 cm). The butts are mainly flat, indicating a flat striking platform on the virtually absent cores from which the flakes were removed; sporadic linear, broken, and natural butts are present. There are 57 cortical flakes, which could be related to the initial stage of core maintenance and exploitation. These activities were most likely carried out in an unknown area of the site;

- fragments (n=355) represent the most numerous group in the assemblage. They consist of 209 flake fragments and 146 undetermined pieces/debris of various stages of knapping production. There are four cortical flake fragments; only seven items are over 4 cm, and 11 are chips (< 1cm).

Cores (n=25) are represented by 11 multiple cores (with changed removal orientation); eight single-platform cores; one double-platform core with bipolar debitage; one single-platform microcore, one fragmented single-platform blade core and three single-platform blade cores reused as hammerstones (figs 83; 84.B–D; 87.10; 90). Of the multiple cores, nine are for flakes, and two are for blades and flakes; eight cores are of Balkan flint (three of its grey variety) and one of Oreshets type flint. The lengths of the negatives vary between 3 cm (for flakes) and 5.7 cm (for blades and flakes). Single-platform cores include: five flake cores; two blade cores, and one for blades and flakes (figs 83.2; 87.10; 90.3); four are of Balkan flint (fig. 83.2) and one of Oreshets type flint. The lengths of the negatives range from 3.5 cm (for flakes) to 6.7 cm (for blades). The only double-platform core is for bladelets and shows traces of accidental heat impact, such as from fire, rather than intentional heat treatment for technological purposes (fig. 84.C3). A microcore for unipolar bladelet debitage has a rejuvenated striking platform and dimensions 1.6 x 1.7 x 1.2 cm (figs 83.1; 90.1). There are no bladelets in the assemblage that could relate to this microcore. An impressive fragment of a single-platform blade core is recorded, with a preserved part of the removal surface and negative impressions of detached blades between 5 and 8.5 cm long (figs 83.4; 90.2). There are three single-platform blade cores reused as hammerstones, with preserved parts of the removal surfaces; they are all of Balkan flint (fig. 83.3, 5).

Varia (n=23) consist of 14 small Oreshets flint nodules with sporadic negatives of initial exploitation or testing of knapping properties (fig. 85). Two other pieces of the same raw materials have more systematic negatives and are determined as pre-cores (fig. 84.A). Initial traces of exploitation, as sporadic negatives are recorded on four flint concretions and three massive flakes (in their case, a kind of secondary debitage was initiated).

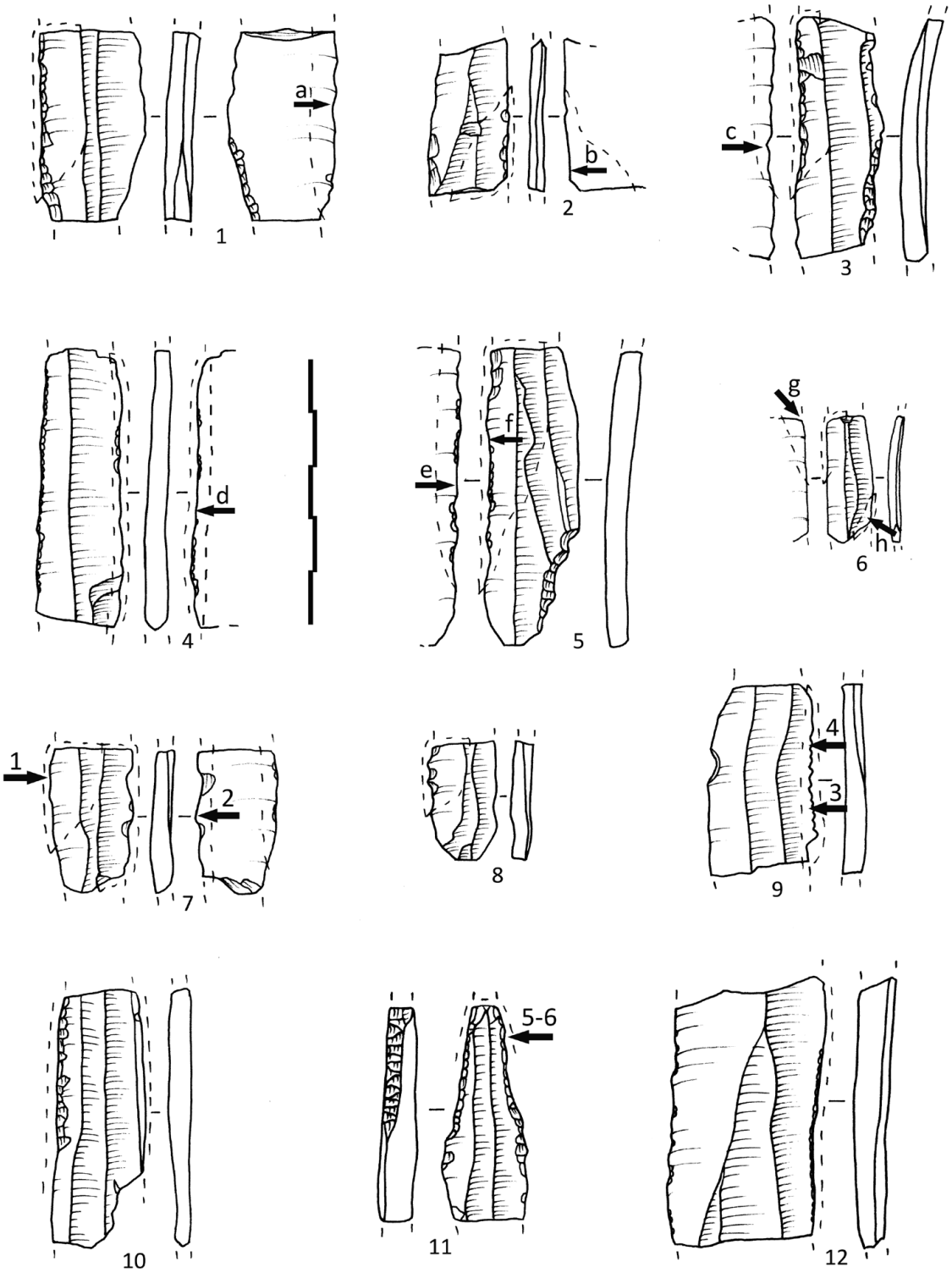


Fig. 88. Blades (6–8, 12) and typological tools (1–5, 6, 9–11). Used edges are marked by dashed lines; the arrows show photomicrographs in figs 92–93

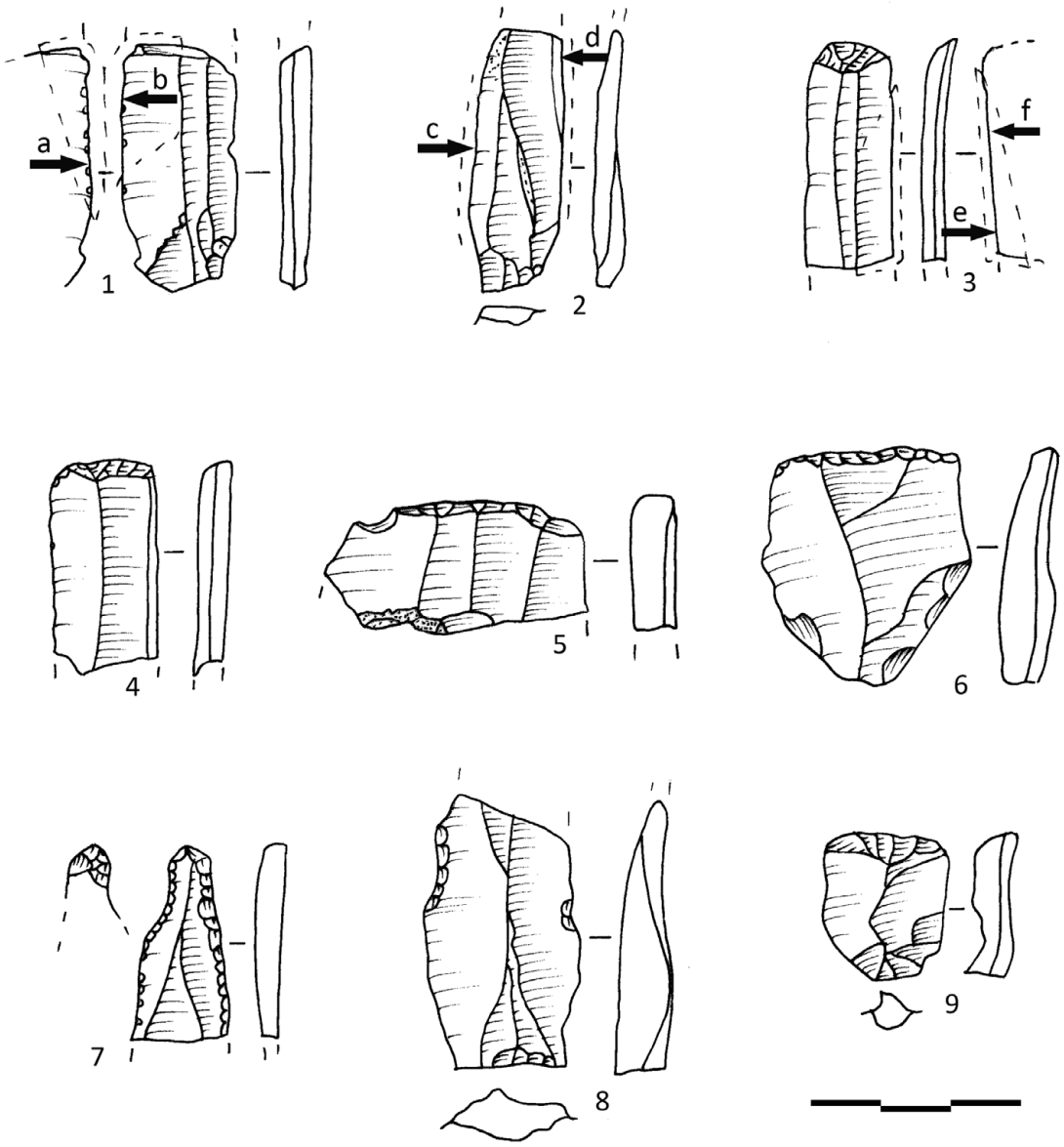


Fig. 89. Blades (1–2) and typological tools (3–9). Used edges are marked by dashed lines; the arrows show photomicrographs in fig. 94

Functional connotations

A selection of artefacts was subjected to use-wear analysis: 25 tools, 40 blades and 10 flakes – based on macroscopic observation on the artefacts' surfaces and edges. The analysis was performed using a stereomicroscope MBS 10 (x100) and a digital microscope Keyence VHX-100[1] (with a magnification range of x25 to x150). The latter was used for the photomicrographs. The

1 Available for use in the Conservation and Restoration Laboratory of NAIM–BAS.

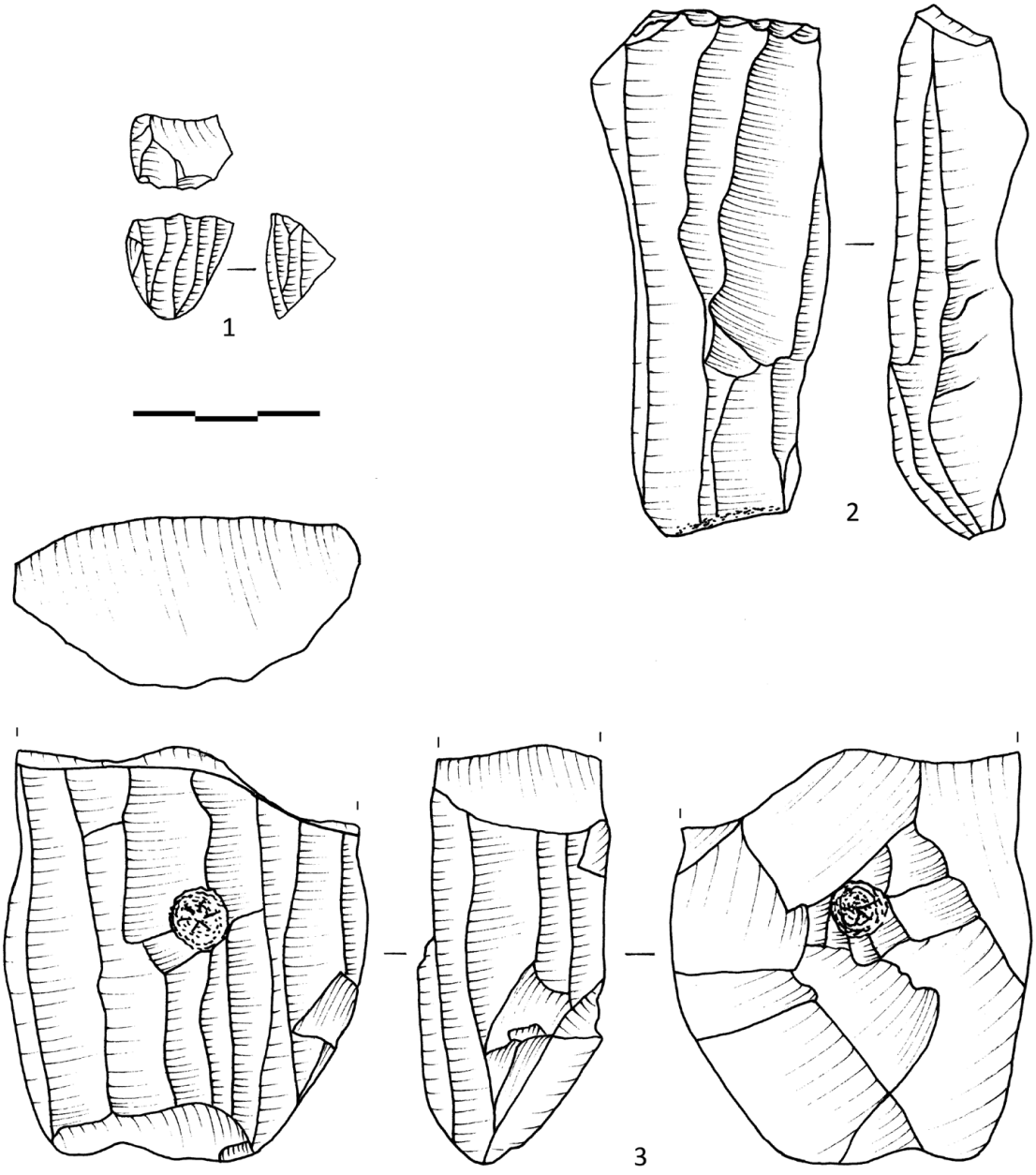


Fig. 90. Cores: microcore for bladelets (1); single-platform blade cores of Balkan flint (2–3)

functional determination combines macro- and microtraces of utilization with emphasis on the latter, because the macrochipping could be due to various taphonomic factors. There are 40 artefacts with identified functions – 17 typological tools and 23 blades. Their distribution by categories and material worked is shown in Table 14.

Table 14

Worked material	Tools / *of BF*	Blade / *of BF*	Total / *of BF*
Cereals	8 / *6*	9 / *7*	**17** / 13
Other plants	2 / *2*	5 / *4*	**7** / 6
Wood	1		**1**
Meat/fresh hide		2 / *1*	**2** / *1*
Hide	2 / *2*	2 / *1*	**4** / *3*
Bone /antler	1 / *1*	3 / *1*	**4** / *2*
Stone/mineral	3 / *2*		**3** / *2*
Undetermined material		2	**2**
Total	**17** / ***13***	**23** / ***14***	**40** / ***27***

Table 14. Distribution of used artefacts by categories according to the worked material (numbers in italics refer to used tools made of Balkan flint)

- The typological tools with identified functions consist of 13 retouched blades (seven with bilateral and six with unilateral retouch), three pointed tools, one endscraper on blades and the burin. The retouched blades cover four different functions: sickle inserts (n=8), cutting other silica-rich plants (n=2), cutting hide (n=2) and wood (n=1); all pointed tools are functional borers used for drilling stone/soft mineral; the endscraper served as a sickle insert, and the burin was used for sawing bone. It is noteworthy that with one exception (*vide infra*), all longitudinal gestures/operations are unilateral. The sickle inserts are most numerous, with diagonal cereal polish, and there are seven tools – five bilaterally retouched blades, one unilaterally retouched blade, and an endscraper (figs 88.1, 3, 5, 89.3; 92.a, c, e–f; 94.e–f). Only one retouched blade possesses parallel polish along the working edge with utilization microchipping (figs 88.4; 92.d). The use of a sickle with axial hafting, unlike the traditional Karanovo type, is very rare among Neolithic harvesting tools (Gurova 2005, 3; 2018a, 195). The cereal polish is typical, with varying intensities of striations caused by abrasive agents. Drilling stone/mineral is expectedly referring to tools with solid tips (one of them is broken, apparently during use (figs 86.1; 88.11; 93.5–6). The microtraces consist mainly of tip smoothing, microtopography with polish spots, and a few linear components (fig. 93.5–6). Plant possessing was identified on two unilaterally retouched blades (figs 87.2; 91.a). Hide cutting is represented on two unilaterally retouched blades, one of which is the only tool used bilaterally (fig. 88.10). One large bilaterally-retouched blade (with alternate retouch) served for sawing wood (figs 87.8; 91.e–f). The only burin in the assemblage was used for bone processing. It is worth stressing that the majority of the tools used are made of Balkan flints, as shown in Table 14.

- The used blades number 23 – eight proximal, 14 mesial and one distal fragments. Like the used tools, most blades used for cereal harvesting and other plant processing are of Balkan flint, but unlike the other tools, the dominance of Balkan flint is less clear. Nine blades were used as sickle inserts – 8 of them with unilateral utilization and diagonal cereal polish with varying presence of striation/abrasion (figs 88.2, 7–8; 89.1; 92.b; 93.1–2; 94. a–b). One mesial fragment shows bilateral use as a sickle insert, with strong subsequent posterior smoothing of one of the working edges due to hafting impact after reversing the insert (figs 88.6; 92.g–h). Five blades

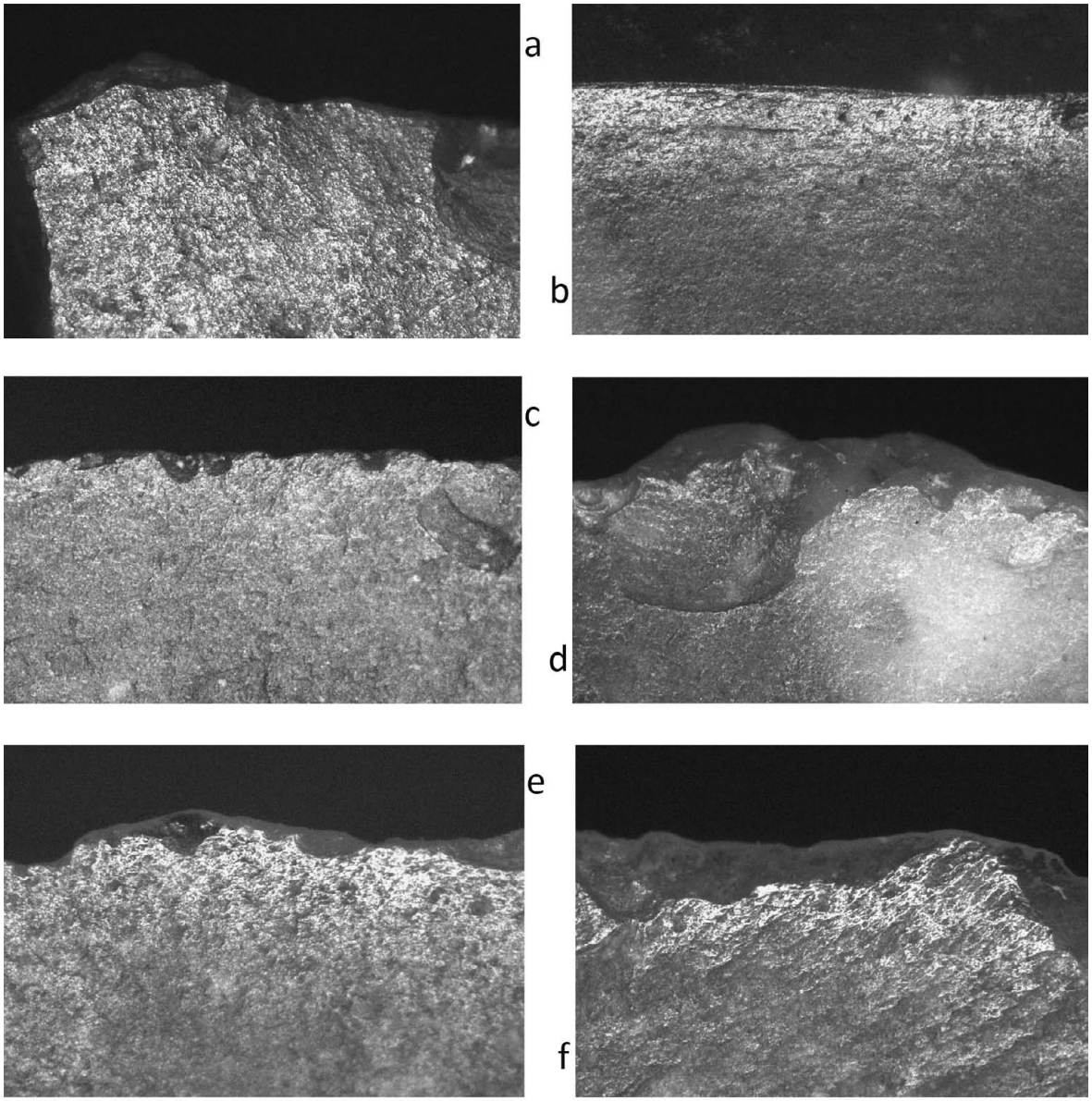


Fig. 91. Photomicrographs of use-wear traces of artefacts in fig. 87: cutting plants (a–b, x80); sawing bone (c, x100); cutting and scraping dry hide (d, x100); sawing fresh wood (e–f, x100)

were involved in plant processing (figs 86.5; 87.5; 88.9; 93.3–4). Two of these blades possess macrochipping – one bilateral (fig. 87.5) due to the utilization of the right edge and some taphonomic alteration on the left edge (fig. 91.b); in the second case, the microchipping is ventral and slightly denticulated during the use – most likely cutting reeds (fig. 88.9; 93.3–4). Two blades were used for cutting dry hide (figs. 87.9; 91.d); two others were involved in butchering (figs 89.2; 94.c–d). Three blades were used in bone processing (figs 87.1; 88.12; 91.c). There are two blades with unilateral use on some undetermined material (figs 86.2; 87.7).

The prevalence of sickle inserts is high, suggesting the importance of agriculture in the subsistence economy. On the other hand, the minimal proportion of tools for animal products processing is striking and surprising. Unfortunately, there is no specialized palaeobotanical study for Yarlovitsa, but plausibly, the results of the archaeobotanical study of Structure 1 and Grave 1 from Ohoden could be extrapolated. That analysis reveals the following cereal taxa:

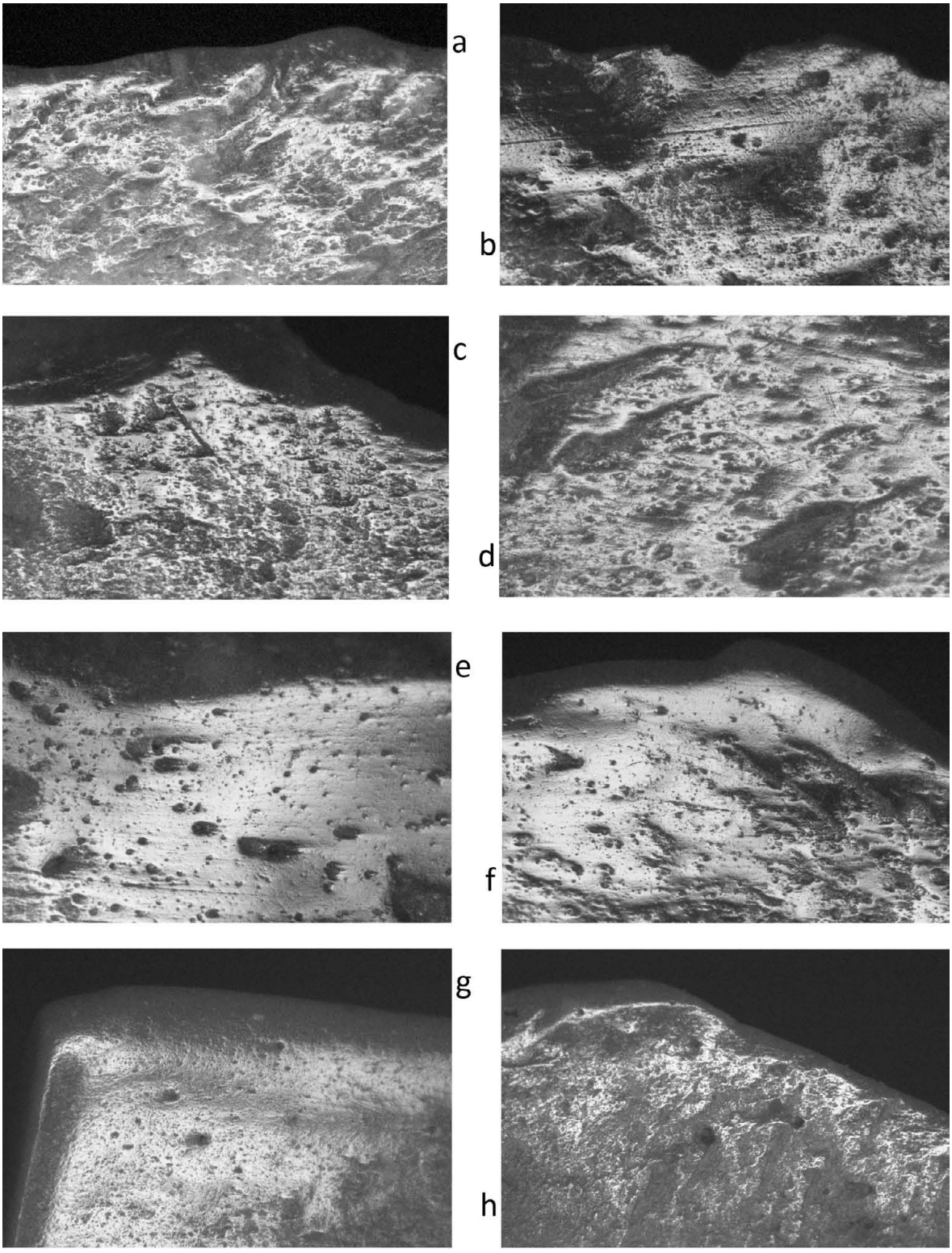


Fig. 92. Photomicrographs of use-wear traces of artefacts in fig. 88: cereal polish with varying degrees of abrasion (a–f, x100); cereal polish with subsequent smoothing of hafting (?) (g–h, x80)

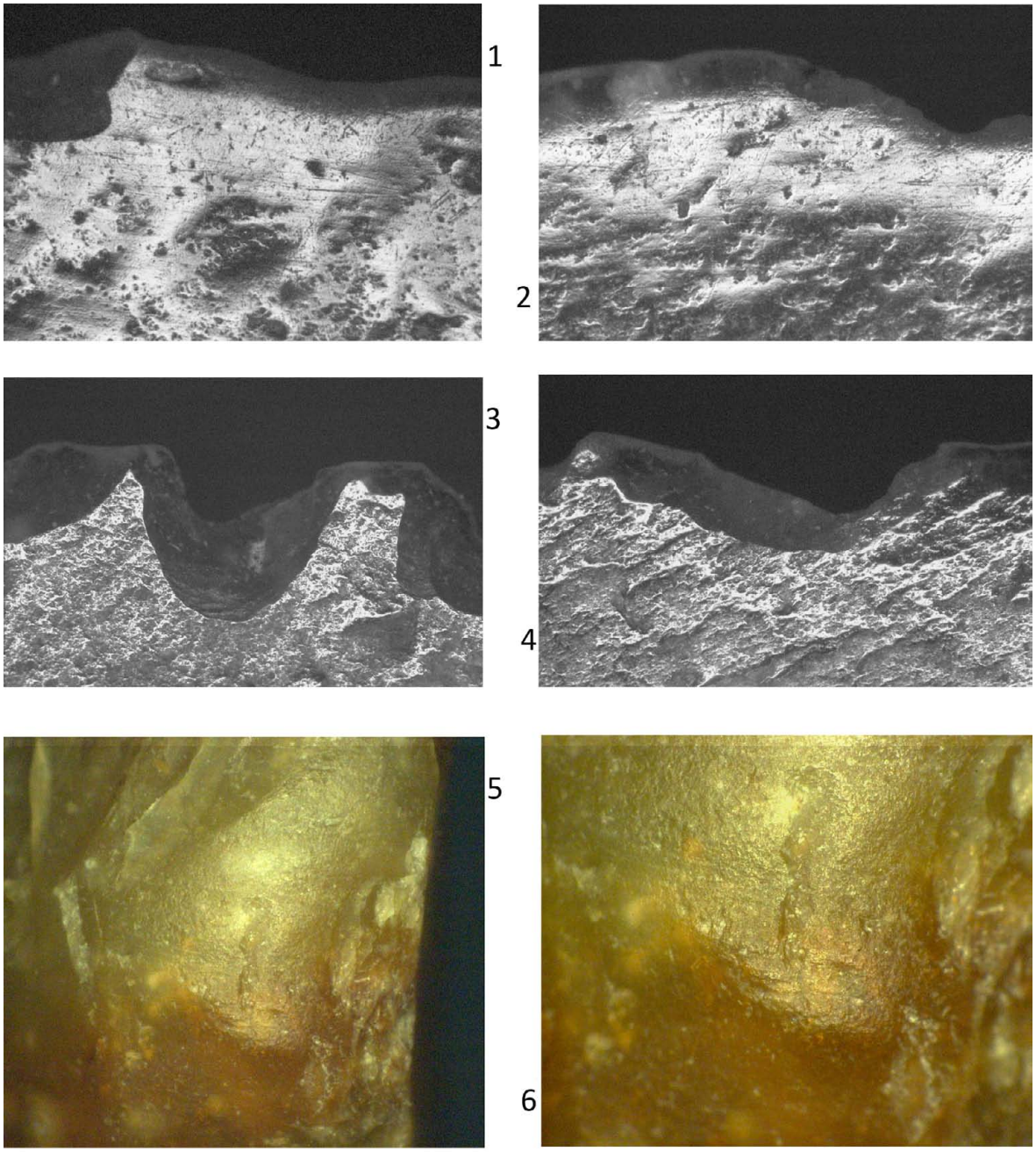


Fig. 93. Photomicrographs of use-wear traces of artefacts in fig. 88: cereal polish (1–2, x100); cutting plant (beginning of sickle) (3–4, x100); drilling stone/mineral (5–6, x80)

Triticum monococcum, *Triticum dicoccum*, *Triticum* sp. (hulled emmer) and *Hordeum vulgar*e (Marinova 2009, Table 21). The prehistoric crop inventory includes leguminous plants, among which the most important are *Pisum sativum* (pea) and *Lens culinaris* (lentil), which are the most common pulses in the Bulgarian Early Neolithic (ibid., 78–79). The same five crops are present in the archaeobotanical assemblages from Neolithic sites in Serbia (Filipović 2014, 209). Present in both regions, cerealia taxa and pulses represent a sufficient crop spectrum, ensuring efficient agricultural practices, as confirmed by the functional analysis of selected artefact samples from Yarlovitsa.

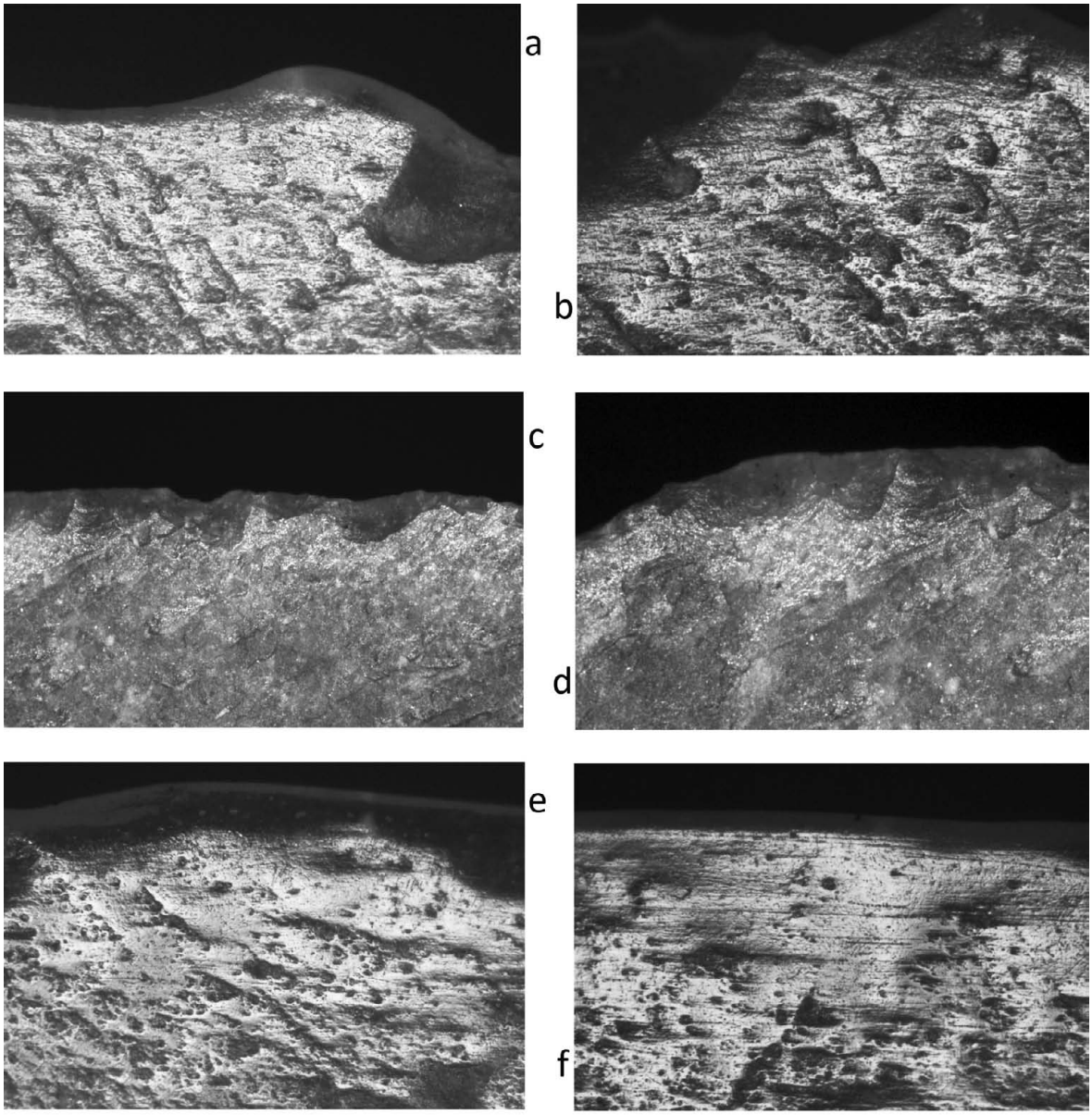


Fig. 94. Photomicrographs of use-wear traces of artefacts in fig. 89: cereal polish with varying degrees of abrasion (a–b, e–f, x100); cutting meat/fresh hide (c–d, x80)

General observations and discussion

The assemblage of Yarlovitsa is intriguing in the lens of the following points: i) abundance of Balkan flint giving an aspect of relative homogeneity of the raw material present; ii) the affiliation of pottery features to Starčevo IIb and Ohoden requires a comparison between Yarlovitsa and Ohoden assemblages from one side, and Yarlovitsa and assemblages referring to the Starčevo cultural group in Serbia – from the other side; iii) a comparison with Dzulyunitsa is very challenging because the Dzhulyunitsa I and II pottery assemblages show closer parallels not with the Starčevo cultural complex (as for other Early Neolithic sites in central-north and northwest Bulgaria) but with sites in Anatolia, with the strongest affiliations to sites from western Anatolia and the Marmara region. Thus, the Yarlovitsa assemblage is intriguing for potentially possessing dualistic features between two profoundly different Early Neolithic cultural milieux – the Starčevo cultural complex and northwestern Anatolia.

The only assemblage from the Starčevo technocomplex that I studied is from the Drenovac site in the Middle Morava Valley (seasons 2005–2006) (Gurova 2016b). The study attempted to distinguish between Starčevo and Vinča features of the assemblages in a diachronic perspective, based on previous studies that introduced conventional conceptualizations on the Starčevo and Vinča complexes in terms of chipped-stone assemblages (Kozłowski, Kozłowski 1984; Kaczanowska, Kozłowski 1990). There is no similarity between earlier Drenovac and Yarlovitsa in terms of raw material or typological repertoire: Drenovac is strongly dominated by endscrapers, followed by truncated and retouched blades, and perforators/borers. There is one geometric microlith – a trapeze (Gurova 2016b, 35, Table 2). As for Yarlovitsa, its repertoire (see Table 13 above) suggests dominance of retouched blades, followed by endscrapers (most on blades), perforators/borers, truncations, retouched flakes, etc., and no geometric microliths. The Yarlovitsa typological spectrum matches Group 1 of Starčevo culture assemblages (with noticeable prevalence of endscrapers), as defined by Kozłowski & Kozłowski based on known assemblages, such as Anzabegovo, Divostin, and Golokout. Group 2 embraces assemblages with high frequencies of microliths (rhombs and trapezes), which "…falls between retouched blades and retouched flakes, next to them in number are splintered pieces, truncations and scrapers" (Kozłowski, Kozłowski 1984, 275). A striking similarity with the Early Neolithic assemblage of Lepenski Vir III, which belongs to the Starčevo culture, is the importance of Balkan flint (65,7% of the whole assemblage of Lepenski Vir III), imported to the site from the Pre-Balkan Plateau (ibid., 267). It is presumed and stated that this flint, appearing in small quantity in the pre-Neolithic Lepenski Vir I "…was brought by the population of Starčevo– Körös complex" (ibid., 263). This chrono-cultural inconsistency, whereby people from a Neolithic background brought raw materials to a community with a pre-Neolithic character at Lepenski Vir I, is confusing. However, this also suggests that the network of Balkan flint supply from the outcrops in northern Bulgaria may have been operating during the pre-Neolithic. Still, the relevant introduction of Balkan flint into the narratives of Pre- and Early Neolithic supraregional raw material networks is a significant merit. Forty years later, we, fortunately, know with certainty where in north Bulgaria Balkan flint outcrops are located, and it is a problem of high importance now to enlarge our empirically relevant analytical results on Balkan flint from other sites and to reconstruct the origin, pathways and timing of Balkan flint distribution in the Balkans.

An important and more recent study of the Mesolithic–Neolithic transition in Serbia, with a focus on the raw material problem, underlines the considerable role of Balkan flint from the beginning of the Lepenski Vir sequence (cf. Kozłowski, Kozłowski 1984) and then for other Serbian Early Neolithic sites where the Balkan flint percentage within the assemblages varies from 65.7% (Lepenski Vir III) to 5.9 % at Blagotin (Bogosavljević-Petrović, Starović 2016, 21–23, Table 4). As for the typological spectra, no strict regularity is evident; however, retouched blades, splintered pieces, and, less commonly, endscrapers are the basic types, with geometric microliths present sporadically. It is noteworthy that steeply retouched Balkan flint blades are found at sites such as Velesnica, Knjepište, and Ušće Kameničkog Potoka. As for Lepenski Vir III, Balkan flint tools prevail and are classed as "formal tools". Also, a complete reduction cycle/sequence of Balkan flint is detected except for the initial nodule decortications (ibid., 24–26, 34). Balkan flint is considered as imposing a new technological standard through the production of long blades and is interpreted as an "… important potential "filter" for the recognition of interactions between traditional foragers and incomers into the region of the Iron Gates" (ibid., 34–35). Thus, the role of Balkan flint is convincingly demonstrated as an inevitable factor in the Neolithization of the Central Balkans (or, more precisely, northeastern Serbia incorporating the

unique Iron Gates cluster). Taking into account the fact that the only securely identified Balkan flint provenance area is in central northern Bulgaria, the role of Bulgarian Early Neolithic sites, including those equidistant from the potential outcrops, such as Dzhulyunitsa, and those in the northwest corner, such as Yarlovitsa, became potentially important as redistribution centres of Balkan flint raw materials and by-products. Other scenarios are, of course, admissible as well, such as the hypothesis that itinerant specialists distributed the Balkan flint. None of these possibilities can be rejected or verified.

As for the comparison between Yarlovitsa and Ohoden, the raw material comparison is impossible because of the completely different approaches to the topic. My reasoning on how Ohoden's raw materials were "analyzed" and presented by R. Zlateva-Uzunova is clearly expressed in the above-quoted paper. Just to reiterate: "Although the cited publication of the Ohoden flint assemblage contains instructive data about the techno-typological characteristics of the artefacts, no sufficiently usable and unambiguous information about the raw materials could be gained, and thus the material remains out of any reliable comparative analysis" (Gurova et al. 2021b, 238). Based on macroscopic descriptions without any geological context, sampling, or subsequent proper analyses, the suggested provenance and procurement strategies are irrelevant. There are, however, some coded types that could refer to Balkan flint (BG.Oh.F5 and F6). Still, their provenance is based on Zlateva's assumption that they came from the Razgrad region (ergo, they are part of the Ludogorie flint unit!) rather than on a relevant geological study. Typologically, some similarity can be traced in the dominance of retouched blades, followed by endscrapers. At Ohoden, in contrast to Yarlovitsa, retouched flakes and notched tools are numerous. Also, seven geometric microliths are recorded from Ohoden against none from Yarlovitsa (for the Ohoden data, see Zlateva-Uzunova 2005, 66, Table 19).

Seemingly, the most convincing and empirically proven similarity is between the assemblages of Yarlovitsa and Dzhulyunitsa (see Case study no. 2). Concerning the raw material, the similarity lies in the Balkan flint frequency across all techno-typological categories of artefacts, especially among tools. There is, however, a difference in the fact that at Yarlovitsa the dark-grey white spotted flint (visual grey version of Balkan flint, still unprovenanced) is virtually absent, contrary to other light greyish-beige colouristic variants of Balkan flint. As for the typological spectra, the similarity lies in the prevalence of retouched blades, followed by endscrapers (mainly on blades), retouched flakes, and splintered pieces. Burins and notched items are minimally represented. At Yarlovitsa, more perforators/borers and truncations are recorded than at Dzhulyunitsa. At the latter site, three trapezes are present, while Yarlovitsa is entirely devoid of geometric microliths. Another difference lies in the functional connotations of the toolkits. Unexpectedly, at Dzhulyunitsa, few sickle inserts are recorded, in contrast to artefacts involved in the processing of animals – butchering, and hide and bone working. At Yarlovitsa, sickles dominated, while treatment of animal by-products was minimal. This raises questions, but it should be kept in mind that the use-wear analysis involved selected representative samples from both assemblages.

In summary, despite the lack of absolute dating and specialized research (in palaeobotany and archaeozoology), Yarlovitsa is critical in terms of its flint assemblages and its potential role in reconstructing the distribution network of Balkan flint in the Balkans.

1.4. CASE STUDY NO. 4: CHIPPED-STONE ASSEMBLAGE FROM ILINDENTSI

Introduction

The two-stage excavations of the Early Neolithic site of Ilindentsi, conducted between 2004–2009 and 2011–2018, resulted in a chipped stone assemblage of 230 artefacts. The raw material, techno-typological analysis, and brief functional assessments are presented below.

The chronological and cultural context of the settlement was revealed through detailed pottery analysis, which dated it to the Early and Middle Neolithic periods in the Middle Struma Valley. This analysis aligns with findings from various other sites, including well-known locations such as Kovachevo and Balgarchevo (Pernicheva-Perets et al. 2011; Grębska-Kulow 2017; 2024). Ilindentsi is part of a cluster of Neolithic sites in the Middle Struma Valley that provides opportunities for both regional and supra-regional diachronic analysis, highlighting the dynamic cultural and social interactions and networking between sites (Grębska-Kulow, Zidarov 2020; 2021). The relative chronology of the findings was supported by radiocarbon dating.

The Early Neolithic at Ilindentsi is represented by its later (upper) phase, which is contemporaneous with Kovachevo Ic and Id, and is associated with the cultural *koiné* of the Karanovo I culture (Lichardus-Itten et al. 2006, 87; Grębska-Kulow 2017, 250). Features attributed to the middle phase of the Neolithic (5450–5300 BC) suggest a local variant identified as the cultural group Balgarchevo II–Dolna Ribnitsa (Гребска-Кулов и др. 2019, 32; Grębska-Kulow 2017, 255, 258). A statistical analysis of the pottery assemblages from the excavated units enabled an intra-site chrono-cultural distinction between two phases, Ilindentsi I – Early Neolithic and Ilindentsi II – Middle Neolithic, with a seamless transition between the two. This distinction further splits into Ilindentsi Final Early Neolithic (FEN) I and II (Grębska-Kulow, Zidarov 2020, 172). The research conducted at Ilindentsi is crucial for understanding the transition from the Early to Middle Neolithic on a regional scale, as well as the interactions with neighbouring Early Neolithic cultures such as Galabnik and Anzabegovo–Vršnik. How does the chipped-stone assemblage respond to this cognitive challenge? Does the assemblage provide significant insights from a diachronic perspective? Furthermore, how does it fit within the broader context of Early Neolithic regional and supra-regional events in the Balkans, particularly as evidenced by the distribution of Balkan flint in various forms, including the signature ‘package’ of a formal toolkit? The following account seeks answers to these research questions.

Raw materials: characteristics and procurement strategies (figs 95–97)

Similar chipped-stone assemblages are commonly referred to as ‘flint’ assemblages by researchers, which includes not only flint in the strict sense but also other crypto-crystalline and coarser crystalline rocks. In this study, we differentiate the raw materials into three categories whilst acknowledging that only a series of Balkan flint artefacts underwent thorough petrographic and trace element analyses: i) Balkan flint (fig. 95); ii) other silicite varieties and crypto-crystalline rocks (figs 96.D; 97); and iii) quartzite (figs 96.A–C; 97.12). The identification of Balkan flint is based on numerous specialist analyses of this widespread and macroscopically distinctive raw material found in the regional Early Neolithic context (Bonsall et al. 2010; Gurova 2011; 2012a–б; Gurova et al. 2016; 2022b). A cluster of Balkan flint outcrops has been identified and documented in the Pleven–Nikopol region. The most reliably identified outcrops occur in the chalky limestones of the Upper Cretaceous Mezdra (siliceous-carbonate) Formation (cf. ibid.,



Fig. 95. Artefacts (diagnostic formal tools) of Balkan flint. No. 8 is dark due to a heat alteration

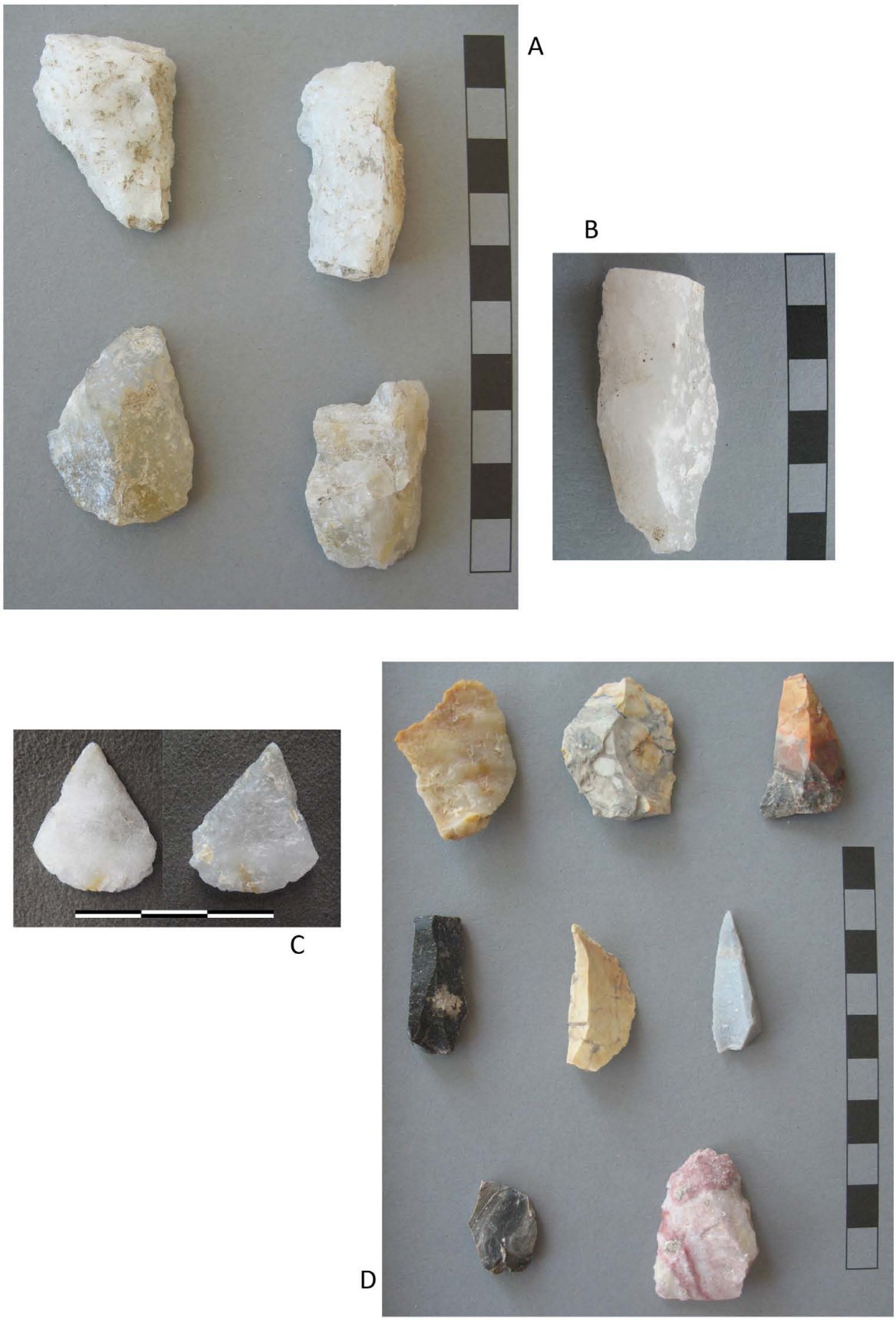


Fig. 96. Raw materials: A–C – quartzite; D – fine and cryptocrystalline rock

and Gurova, Bonsall 2014a). In the Shumen district, outcrops of the newly identified Shumen I type of flint, which visually resembles Balkan flint, were also discovered (Gurova et al. 2022a). The analysed (micropetrographically and chemically) artefacts from Ilindentsi show close similarity to the Pleven–Nikopol outcrop cluster of Balkan flint. Clearly, the site was integrated into the well-established network of Balkan flint distribution, representing one of the longest supra-regional distribution itineraries, covering 308 km, as indicated by GIS modelling (Gurova et al. 2022b, figs 13, 15, Table 2).

The other raw materials show a wide variety of characteristics. Some are composed of crypto-crystalline chalcedony (fig. 97.5), while others feature a coarser quartz groundmass (as shown in fig. 97.7–10). Additionally, there are non-translucent, multi-coloured varieties (cf. fig. 97.2–4, 6, 13–14) that may be related to the atypical cherts found in the volcanic rocks of the Rhodopes (see Nachev 2009). Overall, the raw material composition from Ilindentsi closely resembles that of Kovachevo. However, aside from the Balkan flint samples, no specialized petrographic studies have been conducted.

It is essential to note the presence of quartzite artefacts, which highlight a significant similarity to the abundance of quartzite found in Kovachevo, with numerous white and grey variations. Quartzite is commonly observed in the Early and Middle Neolithic assemblages of the Middle Struma Valley, particularly at sites such as Kovachevo and Balgarchevo. Local outcrops of quartzite, characterized by "metamorphogenic diagenesis," have been identified near the Strumeshnita River, originating from the Belasitsa Mountains (Климов и др. 2009, 32)[1]. Additionally, quartzite nodules are readily accessible within the gravel deposits along the Struma River. The overall structure of the assemblage, along with the differentiation of raw materials, is summarized in Table 15.

Table 15

Raw material	Tools	Blades	Flakes	Fragments	Chips	Cores	Varia	Total
Balkan flint	14							**14**
Others	58	18	60	63	59	6	4	**268**
Quartzite	3	3	25	7		1		**39**
Total	**75**	**21**	**85**	**70**	**59**	**7**	**4**	**321**

Table 15. General structure of the assemblage by typological categories and raw materials

Techno-typological analysis

The structure of the assemblage presented above reveals significant differences among the various artefact categories. Debitage pieces (n=235) are predominant, accounting for 73% of the entire assemblage.

The techno-typological description and analysis are organized according to the following differentations:

- typological tools (n=75);
- debitage products (n=235) consisting of:

1 Detailed geological information was provided by Prof. S. Pristavova (University of Mining and Geology, Sofia).

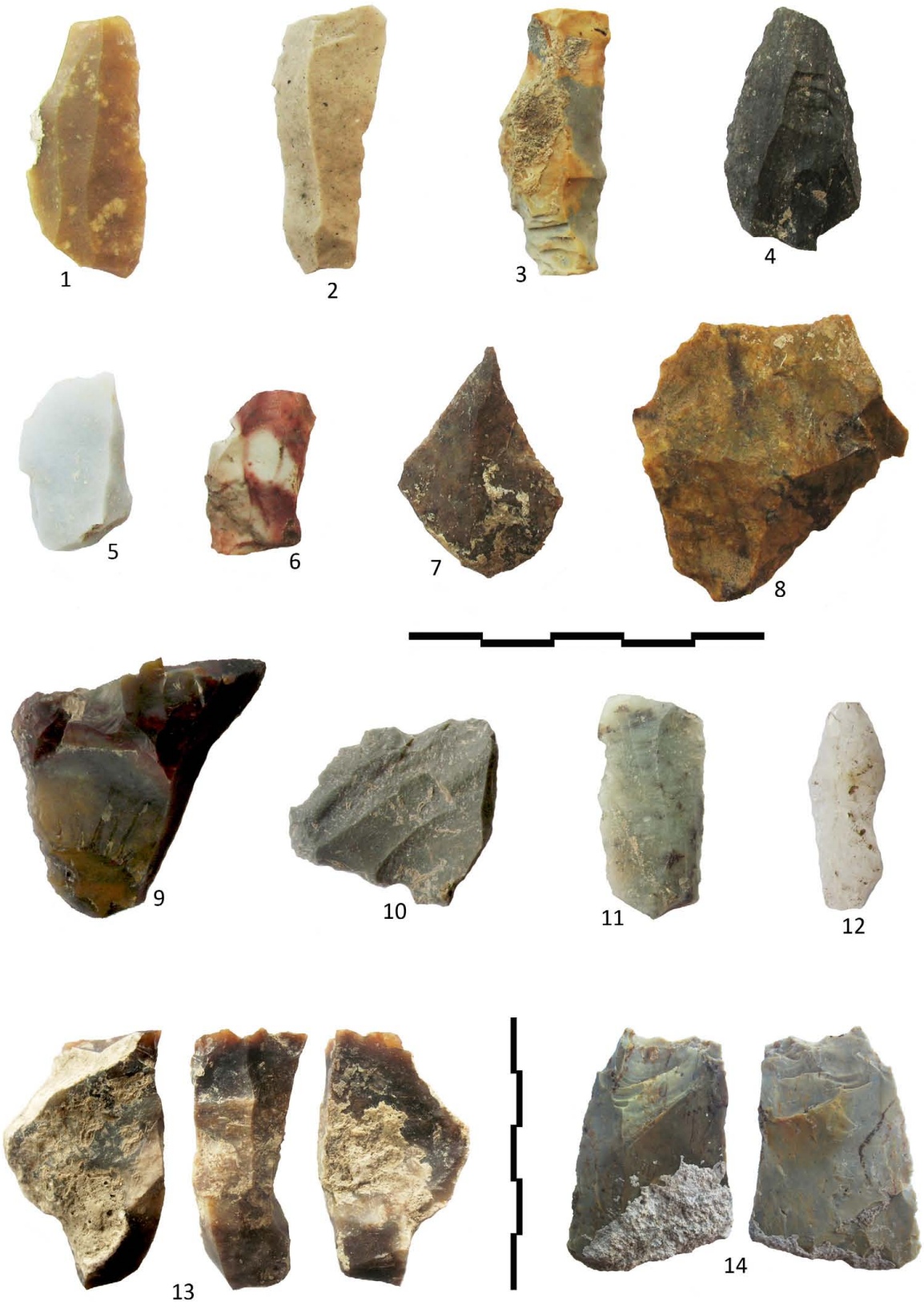


Fig. 97. Raw material varieties: 1 – Balkan flint; 12 – quartzite; the rest – silicite varieties – coarse to fine and cryptocrystalline with different knapping properties and unknown provenance

a) blades (including fragments) (n=21);

b) flakes (only entire pieces) (n=85);

c) fragments (n=70) divided into flake fragments (pieces that exhibit morphological features suggesting they are fragmented flakes but lack butts or proximal parts) and indeterminate fragments or chunks (referred to as debris in some other studies);

d) chips (chunks smaller than 1 cm) (n=59).

- cores (n=7);
- varia (n=4).

The typological tools comprise a diverse repertoire, summarized in Table 16.

Table 16

Tool category	Balkan flint	Other silicites	Quartzite	Total
Retouched blades x 1	1	4	-	**5**
Retouched blades x 2	6	-	-	**6**
Truncated blades	2	-	-	**2**
Backed blade	-	1	-	**1**
Endscraper	1			**1**
Perforators and borers	3	3	2	**8**
Micropiercers and borers	-	33	-	**33**
Retouched flakes	1	12	-	**13**
Splintered pieces	-	3	1	**4**
Notched tools	-	1	-	**1**
Fragment of tool	-	1	-	**1**
Total	**14**	**48**	**3**	**75**

Table 16. Tool categories by raw materials

Several observations can be made from Table 16: i) Balkan flint occurs exclusively as formal tools, which are characteristic of the Early Neolithic 'flint package' found within the Karanovo I and II cultural alliance (see fig. 95); ii) tools made from other types of silicite are more numerous and do not overlap with the repertoire of Balkan flint tools. This disparity is primarily due to a collection of 33 micropiercers and borers. Additionally, although quartzite tools are recorded as individual pieces, they underscore the importance of this raw material within the assemblage as a whole.

Attention should undoubtedly be focused on the Balkan flint tools (fig. 95), as they serve as a chrono-cultural marker of supra-regional significance (cf. Gurova 2012b; Gurova, Bonsall 2014a). The representative diagnostic toolkit from Ilindentsi includes all typological variations: unilaterally and bilaterally retouched blades with (semi) abrupt retouch, where the distal ends are sometimes shaped as endscrapers (fig. 98.3) or pointed like perforators (figs 98.11; 100.12) and borers (fig. 98.4). In some instances, the formal typological characteristics are not clear,

leading to arbitrary classifications; for example, retouched blades with atypical distal transverse negatives (resembling endscrapers) may be interpreted as retouched blades within the broader context of diagnostic formal tools (fig. 100.1, 13). It is noteworthy that Balkan flint tools are most frequently and consistently used as sickle inserts, which is a common feature of Early Neolithic toolkits (figs 98.7, 10; 100.1–3). The second category of tools, which holds regional and contextual significance, consists of micropiercers/borers that dominate the typological repertoire. These tools show a strong affinity with the assemblage found at Kovachevo, where approximately 100 micropiercers/borers have been discovered in significant concentrations[2].

The **typological categories** are presented below, organized by the number of artefacts:

- micropiercers and borers – a total of 33 micropiercers and borers were discovered, along with many other small artefacts, through sediment flotation conducted for palaeobotanical studies. Thirty-one of these tools were found in flotation samples from square C5, which is associated with dwelling remains, and are illustrated in figs 101–103. Two additional tools were later added, one of which likely comes from the same household context (see fig. 99.11). Except for one piercer made of yellow jasper (fig. 103.3), all the other tools are crafted from chalcedony, varying in translucency and ranging in colour from white to beige. The tools are made on small blade fragments and, occasionally, flakes. There is no noticeable standardization in both the shapes and styles of these tools. Eighteen complete pieces are documented (figs 98.17–20, 22; 101.2–3, 7, 11–12; 102.2–3, 6, 10–12; 103.1, 3, 5–7). The fragmented items can be categorized into two groups: those with broken tips (n=9) (figs 98.15; 101.5, 6, 10; 102.1, 4–5, 8; 103.2, 4) and those with broken proximal parts (n=6) (figs 98.13–14, 16, 21; 101.1, 4, 8–9; 102.7, 9). The dimensions of these tools vary: lengths from 0.9 to 1.2 cm, widths from 0.5 to 0.8 cm, and thicknesses from 0.2 to 0.5 cm. The retouch on the tools is generally abrupt and bilateral, primarily concentrated from the middle to the distal end of the edges, with continuous retouch along entire edges occurring infrequently. Instances of both abrupt and semi-abrupt retouch were recorded. In two cases of abrupt and alternate retouch, the tools represent typological borers (fig. 102.6). In three cases, there are superficial distal negatives on the ventral surface – suggesting that these tools functioned as borers (figs 98.14, 16, 18; 101.8–9; 102.9; 103.3). An interesting technological technique was used in three cases, comprising micro-retouch on the proximal dorsal part (fig. 98.15, 17). It is logical to assume a deliberate accommodation treatment, but no use-wear traces were identified on the tips. The retouched (potentially working parts) of the tools are short and asymmetrical; the proximal parts (presumably hafted) are very short and too amorphous to be easily hafted;

- retouched blades (n=11), the majority of which feature bilateral retouch – all made from Balkan flint (figs 98.1, 2, 10; 100.1, 13). Among the blades with unilateral retouch, there is one made of Balkan flint (fig. 100.2) and four with discontinuous retouch, which are made from other types of silicite (fig. 97.2–3);

- retouched flakes (n=13), of which only one is made from Balkan flint and features bifacial retouch (fig. 100.5). The remaining tools exhibit various shapes, dimensions, and styles of retouch. Some of these tools are made on blade-like flakes with well-defined working edges (figs 98.5–6, 8). The types of retouch range from marginal (figs 99.7, 9; 100.9) to abrupt and continuous (fig. 99.13);

- perforators and borers (n=8), being the only typological category represented among all three raw material groups. Three tools are made of Balkan flint and were shaped by bilateral retouch (figs 98.4, 11; 100.12). Two of the perforators are made of quartzite: one is shaped on the proximal part of a flake (fig. 100.6), while the other shows partial alternate retouch (fig.

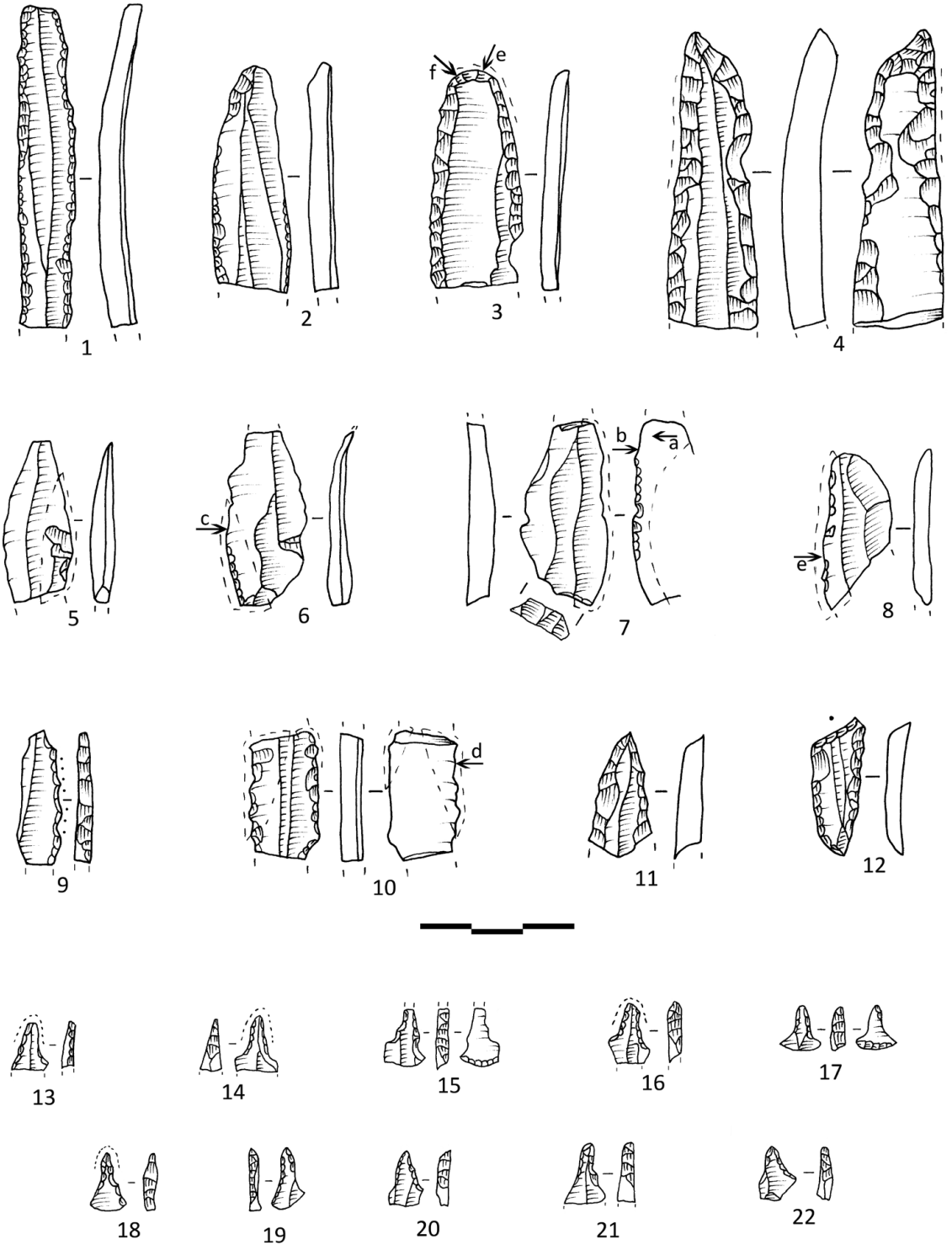


Fig. 98. Typological tools: formal tools of Balkan flint (1–4, 7, 10–12); micropiercers/borers (13–22); other tools 5–6, 8–9); the arrows show photomicrographs in figs 104–105

99.8). The remaining three tools are morphologically diverse: two are complete with differently shaped tips (fig. 99.5–6), and the other is a tip that features bilateral abrupt retouch (fig. 99.10). This last tool is somewhat ambiguous and could also be classified as belonging to the micropiercer group. Of these three tools, two are interpreted as borers: one is a typical borer made of Balkan flint (fig. 98.4), and the other is a distal fragment, which exhibits ventral negatives possibly resulting from use (fig. 99.10);

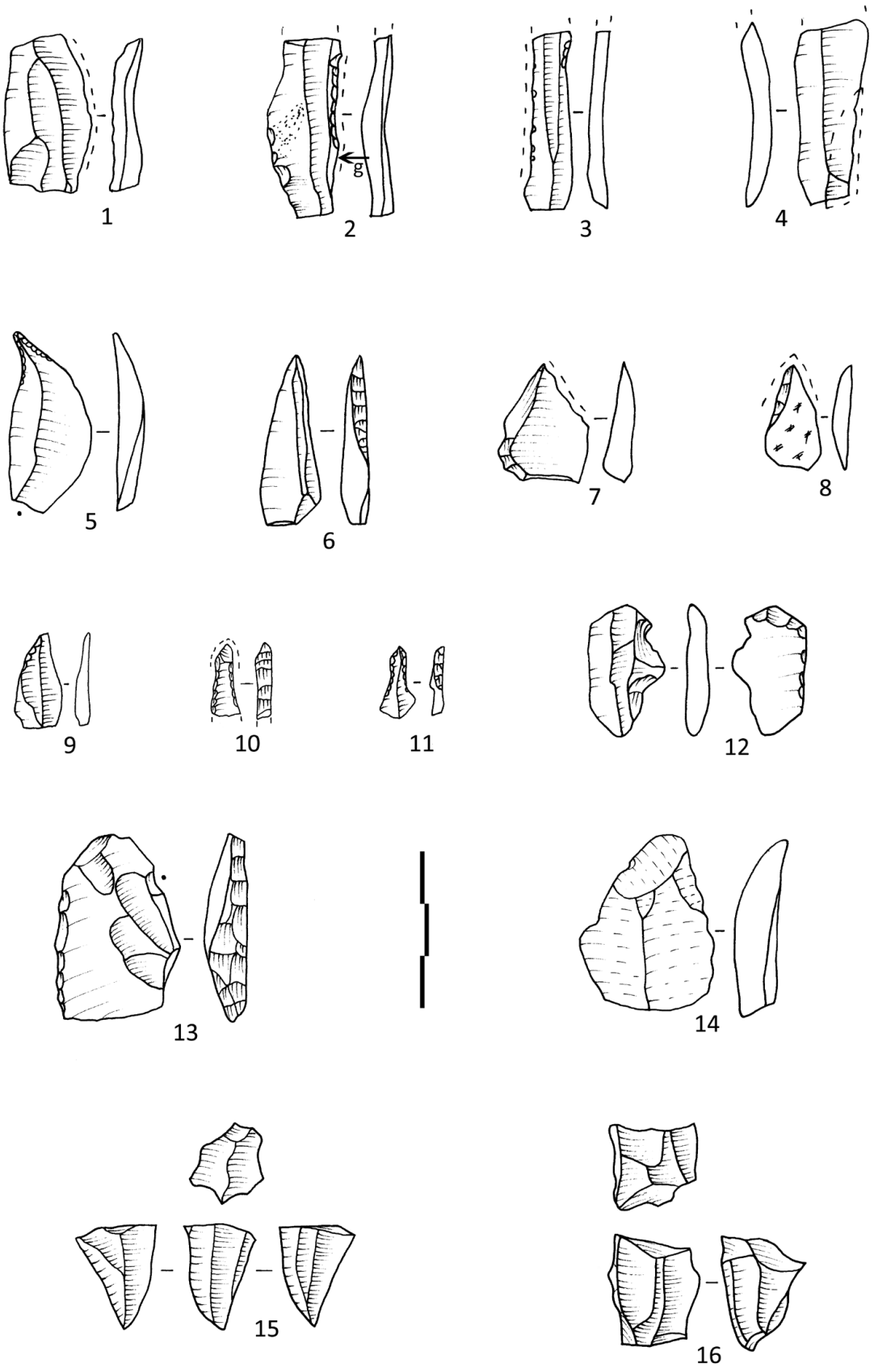


Fig. 99. Artefacts of various technological groups: cores (15–16); debitage (1, 4, 14); typological tools (2–3, 5–13); the arrow shows photomicrograph in fig. 104

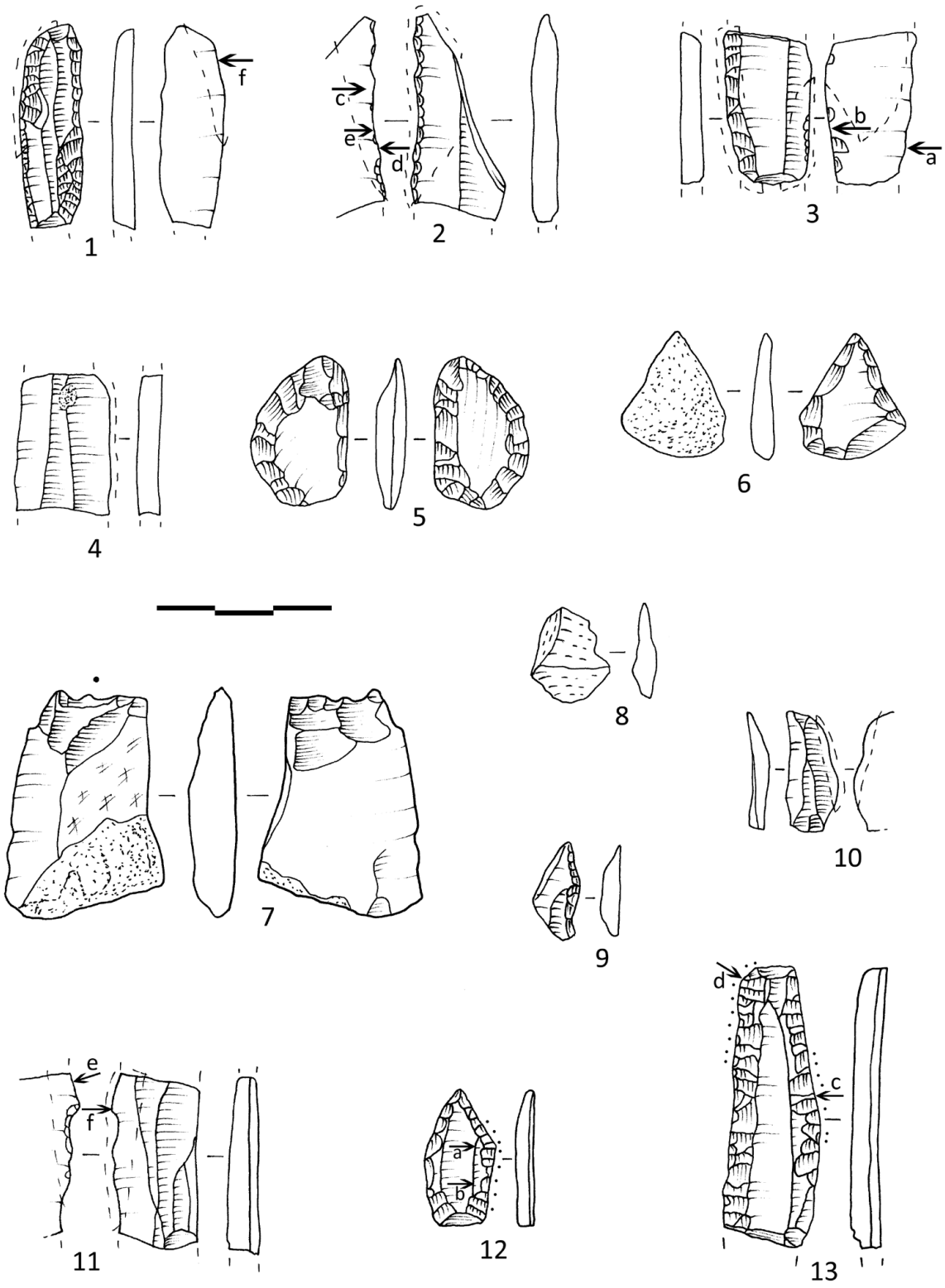


Fig. 100. Typological tools (1–3, 5–7, 9–12) and debitage products (4, 8, 10); the arrows show photomicrographs in fig. 106

- splintered pieces (n=4) represent the following kinds: bipolar and bifacial; bipolar unifacial; and two unipolar bifacial (fig. 100.7). All splinters are from flakes, and one of them belongs to a relatively large tool, measuring approximately 4 cm in length;

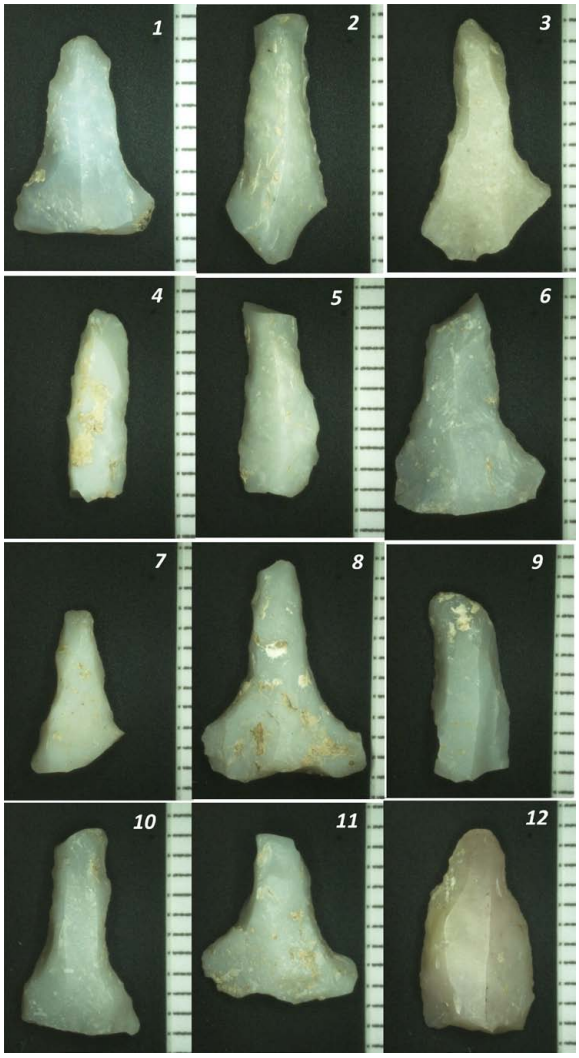


Fig. 101. Micropiercers/borers

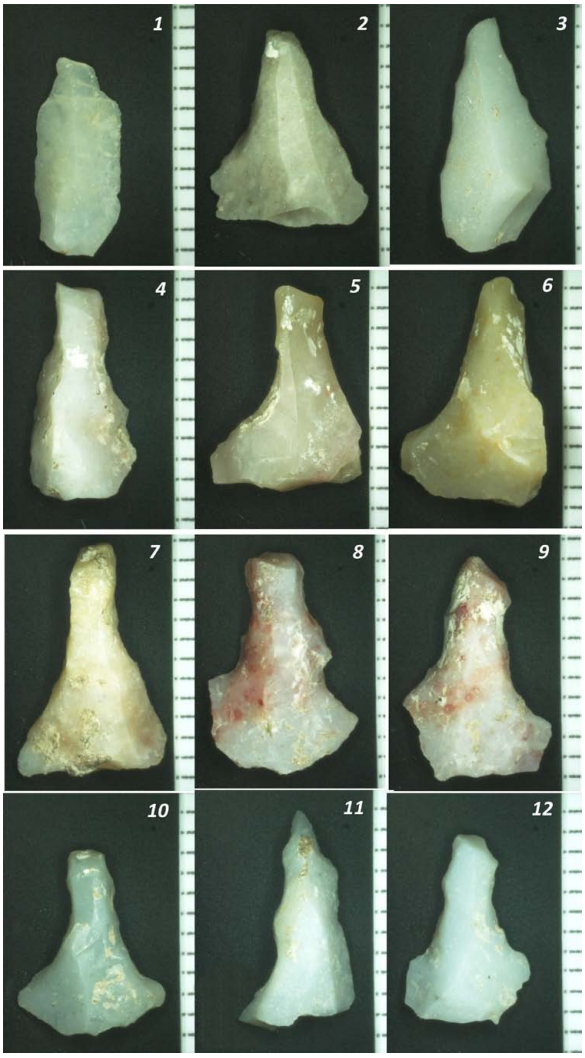


Fig. 102. Micropiercers/borers



Fig. 103. Micropiercers/borers

- truncated blades are two, made of Balkan flint blades and characterized by proximal truncations (fig. 98.7, 12);

- other tools (n=4) include: (i) a backed blade (fig. 98.9); (ii) an endscraper made on a bilaterally retouched blade of Balkan flint (fig. 98.3); (iii) a tool featuring two retouched notches on the right edge, along with partial ventral distal retouch (fig. 99.12); and (iv) a fragment of an indeterminate tool.

Debitage products

- blades (n=21), three of which are made from quartzite (figs 96.B; 97.12). Among these, there are three complete blades, each measuring no more than 3 cm in length. The remaining blades are fragments, categorized as follows: nine proximal fragments (fig. 97.2–3), six mesial fragments (figs 99.4; 100.4), and three distal fragments. The dimensions of these blades vary: their lengths range from 1.5 to 4.3 cm, widths from 0.4 to 1.7 cm, and thicknesses from 0.2 to 0.5 cm. The butts are mainly flat (n=6), with one linear butt and one broken butt also identified. The ratio of trapezoidal to triangular sections is 13:8, indicating an advanced stage of blade debitage. All blades were removed from single-platform cores using either direct percussion or the punch technique. No standardization in technology or raw materials used is evident;

- flakes (n=85), which represent the most abundant category within the debitage (figs 97.4, 6–10; 99.1; 100.10). Among these, 25 pieces (29.4%) are made from quartzite (figs 96.A; 99.14; 100.8). Only three flakes retain cortex. The flakes are generally amorphous in shape and small, primarily ranging between 2 and 3 cm, with three exceptions: the largest flake, made of quartzite, measures 4.1 x 3.2 x 2.6 cm. Additionally, there are six small flakes measuring less than 1.5 cm. Regarding the butts, flat (single blow) butts are the most common, with only a few instances of linear and broken butts. All flakes were produced by direct percussion from single-platform cores, without any notable trend toward standardization;

- fragments (n=79), among which 48 are flake fragments, which include six made of quartzite. All of these flake fragments lack their proximal parts. The remaining pieces are indeterminate chunks that represent various stages of flint knapping. The dimensions of these fragments range from 1.5 cm to 3 cm, with one notable exception being a significant flake fragment that exceeds 4.5 cm;

- chips (n=59) consist of small, undetermined fragments and chunks that resulted from accidental damage during knapping and artefact use, as well as from the resharpening of artefacts. It is important to note that no retouch spalls, in the strict sense, were recorded, indicating that no active toolmaking or resharpening took place on site.

Cores (n=7) are all relatively small, with the maximum length of the removal surfaces reaching 4.3 cm. Two of the cores can be categorized as microcores (fig. 99. 15–16), with removal negatives measuring 2.2 cm, the final series of removed blanks are bladelets. One of the microcores exhibits removal surfaces along its entire length and has a rejuvenated striking platform (fig. 99.15). The second microcore exhibits a change in removal orientation. These two cores were not intended to be used as microcores; rather, they likely represent the final stage of long-term blade core reduction. In addition to the microcores, there are two flake cores (one of which is made of quartzite), one core designed for producing flakes and blades, one specifically for blades and bladelets (fig. 97.13), and one fragmented core intended for bladelets. Unfortunately, none of the surviving blanks could be refitted to any of the cores, and thus the chaîne opératoire remains fragmentary.

Varia comprise four flint concretions, with sporadic negatives resulting from raw material testing or initial exploitation attempts.

Functional connotations

A selection of artefacts was subjected to use-wear analysis: 50 typological tools, 10 blades and 10 flakes. The pilot study was conducted using the microscope available in the archaeological field house, an Olympus SZ61 zoom stereomicroscope (maximum magnification of x100). More detailed observations were made with an MBS 10 stereomicroscope (x100) and a Keyence VHX-100 digital microscope[2], which has a magnification range from x25 to x150. The Keyence VHX-100 was also used for taking photomicrographs. Use-wear analyses were performed on 70 tools, 15 blades, and 8 flakes that exhibited promising morphometric characteristics.

At the interpretative level, artefacts are considered to have been used if they display unambiguous micro-stigmata of utilization, such as polish, striations, and microtopographic smoothing. In some cases, these microtraces complement macrotraces like edge scarring, pseudo-retouch, and PDSM (Post-Depositional Surface Modifications). If convincing use traces are observed, they are deemed significant, even if they are not diagnostic of the material worked.

Table 17

Worked material	Tools/*of Balkan flint*	Blades	Flakes	Total
Cereals	10 / *6*	2		**12**
Other plants	2 / *1*		2	**4**
Hide	2 / *1*			**2**
Meat/fresh hide		1		**1**
Stone/mineral	5		1	**6**
Undetermined	4 / *1*			**4**
Reutilization	1			**1**
Total	**24** / *9*	**3**	**3**	**30**

Table 17. Distribution of used artefacts by categories according to the worked material (numbers in italics refer to used tools made of Balkan flint)

It is essential to highlight that the used artefacts (Table 17) represent only 9.3% of the entire assemblage. In contrast, the proportion of used tools comprises 32% of all tools from the site. Furthermore, Balkan flint tools account for 37.5% of all utilized tools. Another significant observation is the predominance of sickle inserts among the artefact functions. This is not surprising given the likelihood that agriculture was the primary subsistence activity. This is supported by a preliminary palaeobotanical study, which revealed crops that were primarily dominated by *Triticum monococcum* and *Hordeum vulgare* (Гребска-Кулов et al. 2017; 2018, 29). The sickle inserts indicate the use of the well-known Karanovo type of sickle, characterized by obliquely inserted flint elements. A similar feature can be observed in the harvesting toolkit from Kovachevo (cf. Gurova 2006, diag. 2), reinforcing the argument for the close relationship in material culture and agricultural practices between the two sites. It is surprising, however, to find only a limited number of tools designed for processing animal by-products. Notably, the data in Table 17 are comparable to those from the Early Neolithic assemblage at the Yabalkovo site in Thrace (Gurova 2014a, Table 3).

2 Available for use in the Conservation and Restoration Laboratory of NAIM–BAS.

A more detailed description of the used artefacts is presented below.

The typological tools were used for various tasks across the site, yielding a total of 24 identified functional tools. These tools belong to several distinct typological groups:

- retouched blades (n=8), of which five are made from Balkan flint. Four of these tools were employed as sickle inserts and showed signs of intensive use: two were utilized bilaterally (figs 98.10; 100.3; 104.d; 105.a–b), while two exhibited unilateral use (figs 100.1–2; 105.c–f). The remaining Balkan flint retouched blade shows relict traces of plant cutting and evidence of post-utilization resharpening, which removed some of the plant polish from the working edge (figs 100.13; 106.c–d). Additionally, one blade made of chalcedony (fig. 97.11) was initially used as a sickle insert and later repurposed for working an abrasive plastic material (with a low silica content), likely pottery clay (figs. 100.11; 106.e–f). This tool is the only one identified with signs of reutilization. Furthermore, two unilaterally retouched blades were utilized for specific tasks: one for cutting hide (fig. 99.3) and the other for sawing hard abrasive materials such as stone or minerals (figs 99.2; 104.g);

- micropiercers/borers (n=5 – figs. 98.13–14, 16, 18, and 107). Only pieces that exhibit diagnostic use-wear traces at both the macro and micro levels are considered tools. These features include smoothing of the lateral edge in the distal parts, polish spots, local concentric striations, and ventral negatives resulting from rotational kinematics. Some of these utilization features can be seen in fig. 107. A fine carbonate deposit is present on the working parts of the tools; it was not removed to allow for potential residue analysis, which complicated the use-wear diagnosis. In three cases, the tools were used for drilling soft stones or minerals (figs 98.14, 16, 18; 101.8; 102.9; 103.3; 107.B–D). However, in two instances, the material being worked could not be identified (figs 98.13; 101.1, 9; 107.A). Further observations regarding the micropiercers/borers and their uses are presented in the Discussion section;

- retouched flakes (n=4), of which three are blade-like flakes used unilaterally as sickle inserts (figs 98.5–6, 8; 104.c; 105.e). The fourth tool had been used for cutting plants (fig. 99.7);

- perforators and borers (n=4): two are fashioned on retouched blades of Balkan flint. One perforator is a remnant of a sickle insert, featuring partially preserved cereal polish along the right resharpened edge. Another, a typological borer made of Balkan flint, appears to have been used for cutting through hard, undetermined materials (fig. 98.4). The remaining tools comprise a perforator used for piercing soft, non-diagnostic materials (fig. 99.8) and a borer with a preserved tip that was used for drilling into stone or minerals (fig. 99.10);

- endscraper: the only one made from Balkan flint was used for hide scraping using the worked front and the distal part along the right edge (figs 98.3; 104.e–f);

- truncated blade: it is made of Balkan flint and was utilized as a sickle insert, featuring two working zones on the right edge (figs 98.7; 104.a–b);

- backed blade: it represents a relict sickle insert that has partially preserved polish on the right edge, indicating that it was backed after its initial use (see fig. 98.9).

The used blades are three: two of these served as sickle inserts, each with one working edge (fig. 99.4), while the third was utilized for cutting meat or fresh hide (fig. 100.4);

The used flakes are three in total: one was used for sawing soft stone, while the other two were used for cutting plants (fig. 100.10).

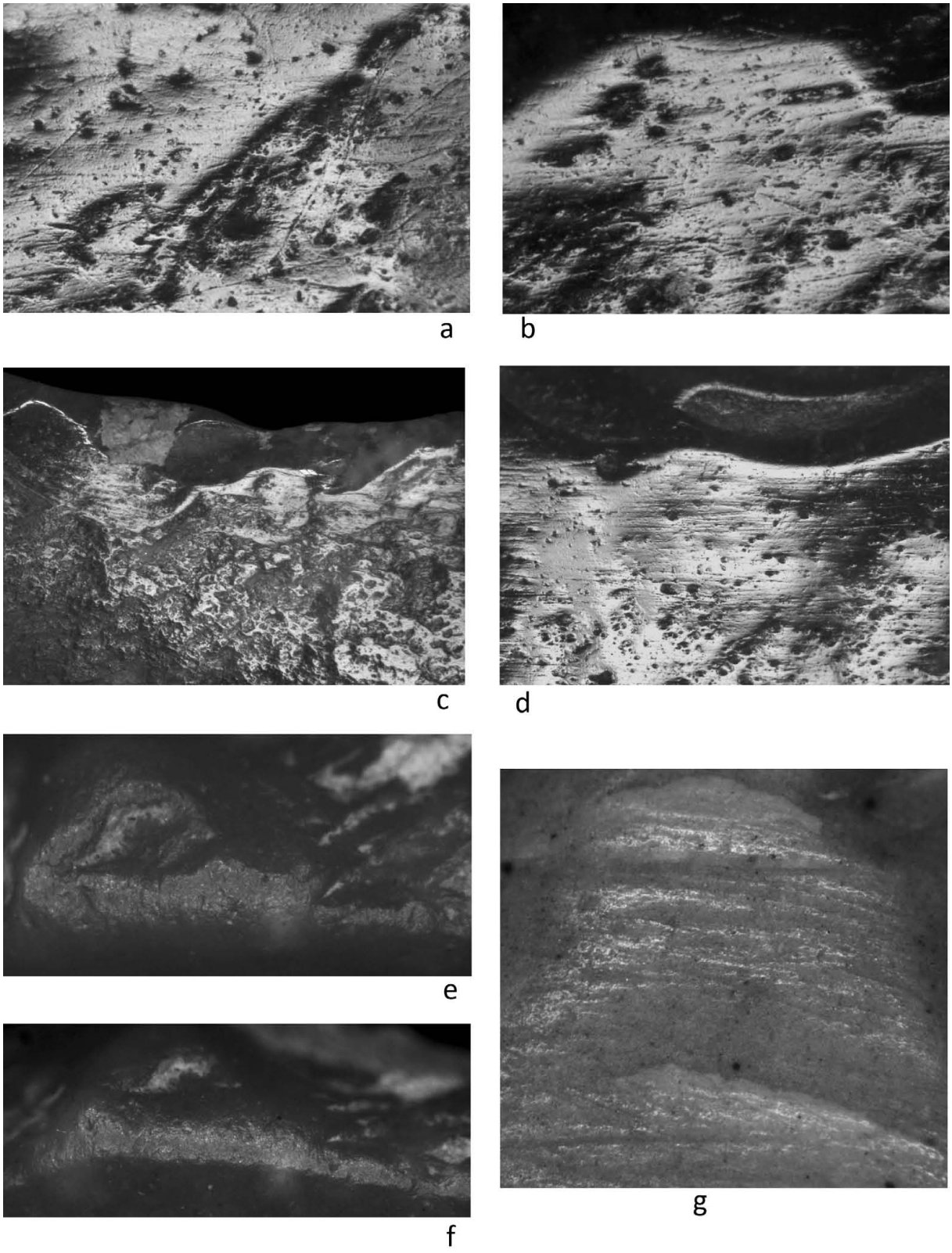


Fig. 104. Photomicrographs of use-wear traces: a–d (cutting cereals – harvesting, x100), e–f (scraping hide, x60 u x80), g (sawing hard material – mineral?). Utilized artefacts in figures as follows: 3, 6–7, 10 in fig. 98; 2 in fig. 99

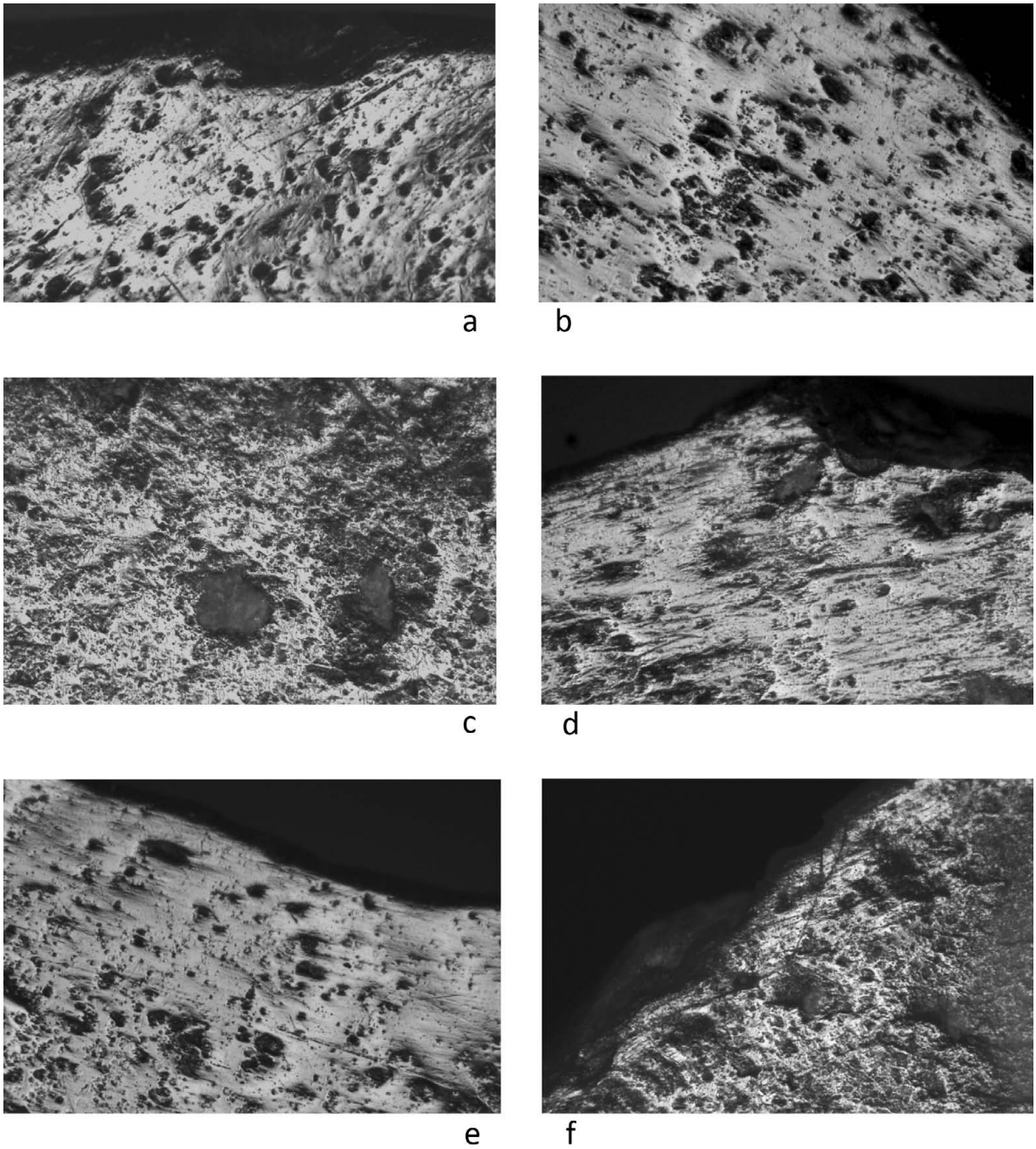


Fig. 105. Photomicrographs of use-wear traces on sickle inserts (x100). Utilized artefacts in figures as follows: 1–3 in fig. 100; 8 in fig. 98

Spatial distribution

Some spatial information about artefact distribution can be examined at the scale of individual squares and, in specific cases, archaeological features in the site planigraphy, such as dwellings, pits, ditches, and ovens. It is important to note that not all artefacts were accompanied by information about their association with features. In this respect, the most insightful findings come from the collection of 32 micropiercers/borers, all retrieved from the flotation of sediments near the destruction of House 1 (squares C5 and D5). The concentration of such a large number of uniform pieces can be interpreted in several ways: i) they could have been produced on-site; ii)

they could have been used at that location; or iii) they may have simply been stored there. However, the absence of evidence for a workshop or atelier for bladelet production and microtool manufacture argues against the first hypothesis. The second hypothesis cannot be verified due to the absence of beads or other jewellery found in the vicinity. Therefore, the most plausible explanation is that this compact toolkit was stored where it was discovered.

The spatial distribution of the diagnostic Balkan flint formal toolkit reveals that these tools were found across multiple explored squares. Specifically, three tools were discovered in square D5, two in square D4, and single Balkan flint tools were found in eight other squares. This suggests there is no reason to consider them as particularly valued and separately stored objects. Overall, the highest number of tools (7) came from square B5, followed by square C5, which contained four tools. Squares A5, B4, and C4 each had 3 tools.

In terms of quartzite artefacts, the greatest quantity was found in square C4 (10 artefacts), followed by squares I5 and B4, with five artefacts in each square. Debitage products, including fragments and chunks, were most numerous in squares C5 and H5, while flakes were found in squares I5 and H5. In summary, only the micropiercers and borers suggest intentional deposition or storage, which could potentially be interpreted as a collection of valuable objects or 'hoard.'

General observations and discussion

The first observation to make is that the detailed chronological and cultural division of the sequence, derived from the statistical analysis of pottery, is not reflected in the chipped-stone assemblage. It is challenging to identify diachronic changes or transformations in the chipped-stone assemblage. Micropiercers made from local materials, such as chalcedony and quartz, appear simultaneously with formal tools made from Balkan flint. This indicates an evolved phase of the Early Neolithic when the Karanovo I culture reached its southwestern variant. Compared to the Kovachevo sequence, this Early Neolithic level should correspond to Kovachevo Ic and Id, as confirmed by pottery analysis (see Grębska-Kulow, Zidarov 2020, 198).

The assemblage from Ilindentsi is informative and significant for several reasons: i) the presence of a formal toolkit of Balkan flint; ii) the presence of 33 micropiercers/borers; and iii) the notable presence of quartzite artefacts, including three typological tools.

The Balkan flint diagnostic toolkit, including characteristic tool types and widely used sickle blades, is represented in the Ilindentsi assemblage. This assemblage is significant in understanding the temporal and supra-regional distribution of this unique toolkit (Gurova 2008a; 2011b; 2012a–b; 2014a; Gurova, Bonsall 2014a). It is essential to note the similarities between the Balkan flint formal toolkit found at Ilindentsi and that at Kovachevo, which suggest a synchronization of Early Neolithic cultural events. Both sites showcase these toolkits during the developed phases of the Early Neolithic: phases Ic and Id at Kovachevo and phases I and II at Ilindentsi. During this time, the region became part of the southwestern variant of the Karanovo I culture (Николов 1996). A pertinent question arises: does the pottery assemblage from Ilindentsi exhibit features that precede the phases Ic and Id at Kovachevo, thereby indicating the influence of Karanovo I on the regional Early Neolithic? To address this question, a deeper understanding of the Neolithization stages in the Middle Struma River Valley, as well as cultural interactions with the Ovche Polje and Anzabegovo–Vršnik cultures, is necessary. However, a genuine comparison of the Balkan flint formal toolkits with those from these neighbouring regions is not feasible without thorough geological investigation and laboratory analyses. V. Dimitrovska has

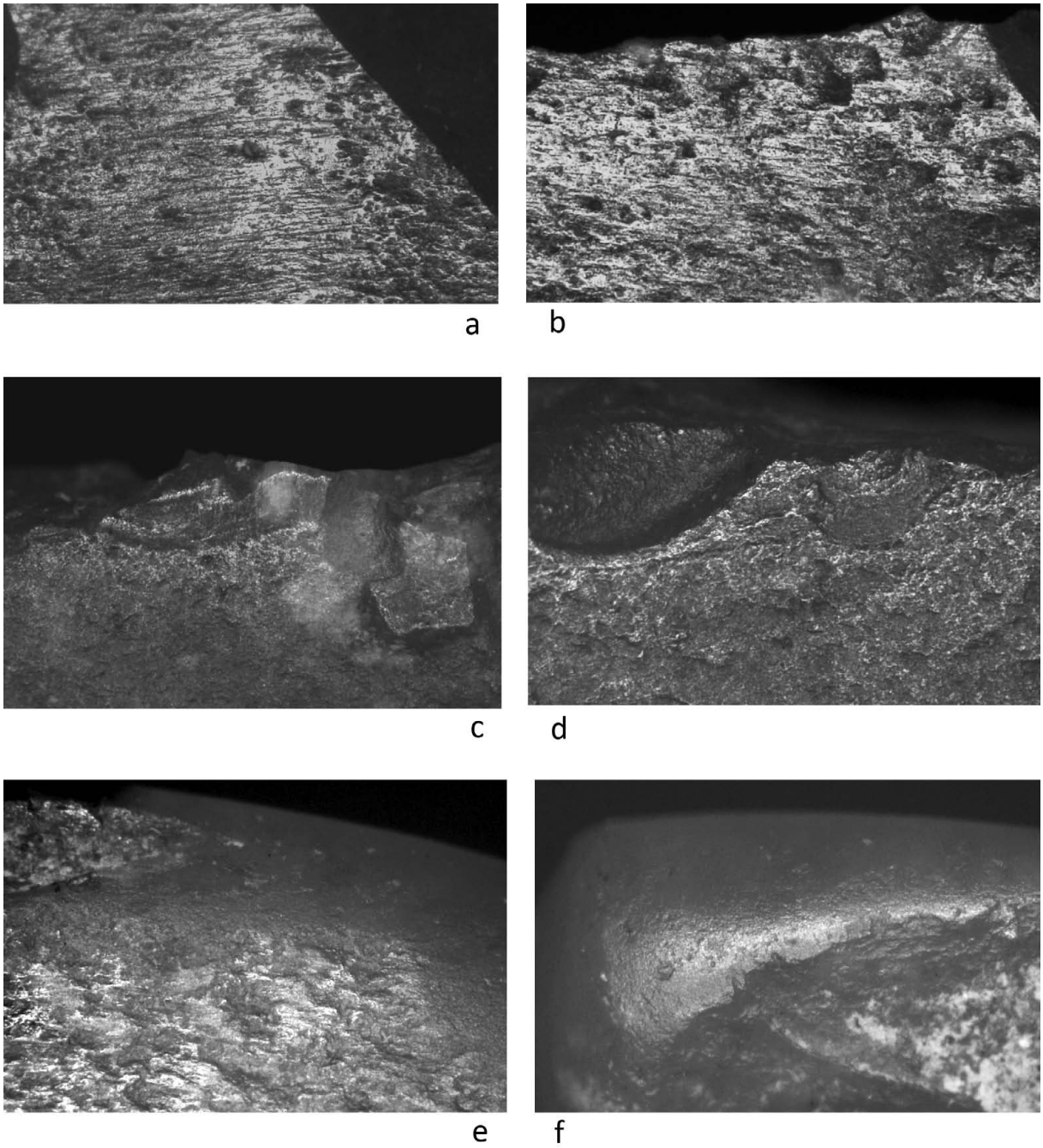


Fig. 106. Photomicrographs of use-wear traces: a–b (cutting cereals – harvesting, x100 – relict sickle), c–d (undetermined material, possibly plants), e–f (sickle reutilized for working plastic silica-rich material – pottery clay?). Utilized artefacts (11–13) in fig. 100

published a limited number of Balkan flint artefacts from six prehistoric sites in the Republic of North Macedonia, including Anzabegovo. These artefacts are macroscopically identical to the diagnostic Early Neolithic formal tools found in Bulgaria (Димитровска 2013, 78, сл. 21; Dimitrovska 2012). The provenance of these North Macedonian artefacts remains unclear, as their origin is hypothetically considered local rather than imported from northern Bulgaria. However, no convincing arguments have yet been presented to support this hypothesis.

Recently discovered Early Neolithic sites in the Republic of North Macedonia have yielded an impressive series of AMS dates, particularly from Vlaho, indicating the establishment of Ne-

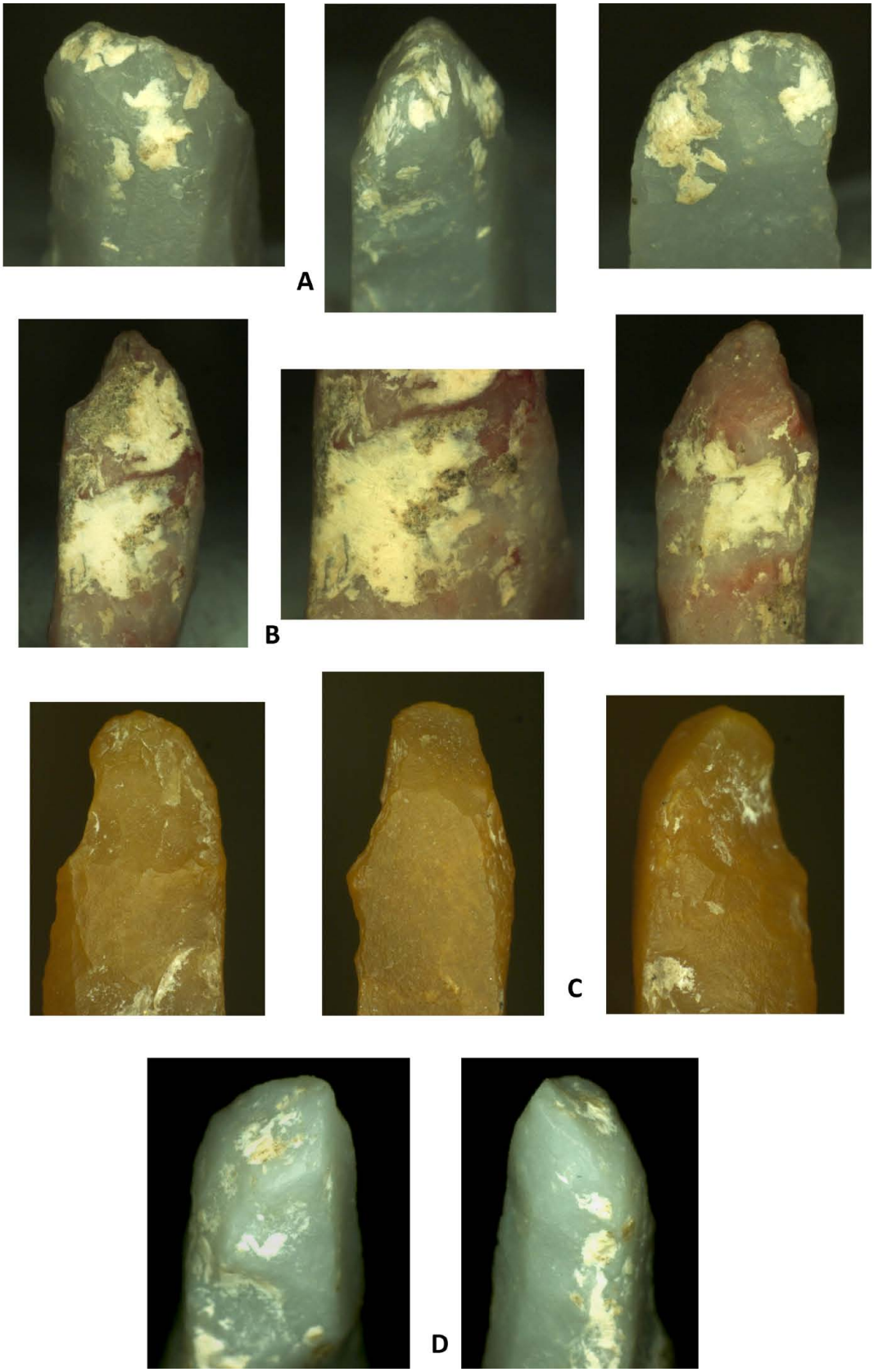


Fig. 107. Photomicrographs of micropiercers/borers with use-wear traces: A – item, no. 9 in fig. 101; B – item no. 16 in fig. 98 and no. 9 in fig. 102; C – item no. 18 in fig. 98 and no. 3 in fig. 103; D – item no. 14 in fig. 98 and no. 8 in fig. 101. A, B, D – x40; C – x50

olithic farming settlements several centuries before 6000 BC. However, there is a lack of suitable published illustrations of the flint artefacts from these sites (Naumov, Reingruber 2024). In contrast, data from Govrlevo and Vrbjanska Čuka provide examples of individual, yet typical, formal tools used as sickle inserts (Naumov et al. 2018; Mazzucco et al. 2022). It is hoped that, alongside significant advances in Early Neolithic research, proper investigations into lithic raw materials will also be conducted.

The collection of micropiercers and borers (also functioning as drills) can be interpreted on two levels: first, as a functional toolkit incorporated into specialized craft production on-site, and second, as part of bead manufacture (likely related to the microdrills) within the broader context of Neolithic cultural diffusion from Southeastern to Central and Northern Europe. A close parallel to the microdrills from Ilindentsi is found in the significantly more extensive collection of micropiercers and borers from Kovachevo (Gurova 2006, Pl. 4; Gurova et al. 2013, fig. 1; Gurova, Bonsall 2017, fig. 12.3). Both collections exhibit similarities in morphology and technology. However, there are notable differences in the characteristics of the raw materials used. The microtools from Kovachevo are crafted from dark grey to black flint sourced from the western Rhodopes[3]. In contrast, the tools from Ilindentsi are primarily made of chalcedony and quartzite/quartz,[4] with one item made of yellow jasper (figs 101–103). Another significant difference lies in their contextual appearance within the cultural sequence. At Kovachevo, these tools are part of the earliest habitation phase, while at Ilindentsi they emerge within a heterogeneous context belonging to the final phase of the Early Neolithic.

Several clarifications are needed regarding the functional identification of these microtools. Morphologically, typologically, and in terms of nomenclature, their function is predetermined—they are designed to perforate and/or drill various materials and are commonly associated with bead manufacture. Typical examples of such tools have been found in Early Neolithic contexts in Greece, including Franchthi (Perlès 2001; 2004). In the cases of the sites discussed, specifically Kovachevo and Ilindentsi, there is an insufficient quantity of beads that can be technologically linked to the microdrilling toolkit. At Ilindentsi, there are 41 very fine beads, of which 36 are miniature clay beads, and 5 are made from various materials such as shell, bone, and mother of pearl (Grębska-Kulow et al. 2021, figs 9–12). All of these beads are too small to be made using the available microdrills, which, when rotated, would produce holes no smaller than 3 mm. Theoretically, all micropiercers and borers could be used to perforate and drill various materials without necessarily leaving detectable microtraces of use. Traceological observations can identify only those artefacts that exhibit clear use-wear traces, such as matte smoothing, shiny polishing, or circular striations. Although the specialized literature contains numerous publications on beads and other drilled ornaments, there is relatively little research on the technological and manufacturing aspects of bead production. The author's experiments provide an empirically grounded perspective on the use of microtools from Ilindentsi. These tools are too small and amorphous to be effectively integrated into a mechanical pump drill, which is known for its efficiency (Gurova et al. 2013; Gurova, Bonsall 2017). It is evident that these microtools were not produced as standardized series with uniform applications. However, they could be effectively utilized in handheld applications or in drilling with a bow. This latter method has been

3 This information is based on unpublished research by geologist M. Pawlikowski on Palaeolithic assemblages near Devin, which identifies the raw material as macroscopically identical.

4 The macroscopic description of microgranular quartz and cryptocrystalline chalcedony is provided by geologist R. Kostov from the University of Mining and Geology in Sofia.

experimentally illustrated in the large-scale production of shell beads in Southern California (Nigre, Arnold, 2013, figs. 3, 5). Experimental studies indicate that specific actions yield clear and reliable microtraces: i) during prolonged drilling of hard minerals (rated 4.5 to 5.5 on the Mohs scale), the tips of the drills become coated with a shiny concentric polish (Gurova et al. 2013, figs. 12–14; Gurova, Bonsall 2017, fig. 12.6); ii) perforators and borers of varying morphologies, when used continuously, develop detectable traces, as shown by R. Yerkes (Yerkes 1983, figs. 2, 3, and 4); iii) the most commonly used material for bead production in prehistory – shells – can be perforated using a different technique. The most effective of these techniques involves applying internal pressure with a suitable organic punch, such as antler or bone, as demonstrated in the experiments by R. Tátá (Tátá et al. 2014, 36).

The emergence of micropiercers, borers, and drills as distinct components in the typological repertoire of Early Neolithic assemblages raises an intriguing question: do these tools serve specific functional needs, such as the manufacture of beads and other ornamental items? Or do they represent the natural and inevitable spread of Neolithic groups and artefacts – from south to north – bringing with them new knowledge, skills, beliefs, and symbolism? Alternatively, could it be a combination of both factors? Research based on a vast empirical collection of beads from across Europe supports these considerations. As noted by Rigaud et al. (2015), “Cultural items fulfilling exclusively symbolic functions are generally considered more useful than functional artefacts for detecting cultural affinities between populations and patterns of cultural change over time.” In light of this quotation, bead types and personal ornaments trace the pathways of Neolithic lifestyles from Anatolia through the Balkans to Central, Western, and Northern Europe, similar to other elements of the material culture, often referred to as the “Neolithic package”. This presents a new challenge for scholars: to enhance our understanding of bead and personal ornament production in Bulgaria during the Early Neolithic, thereby integrating our territory more deeply into the complex process of Neolithization.

1.5. CASE STUDY NO. 5: FLINT ASSEMBLAGE FROM YABALKOVO

Introduction

The large settlement of Yabalkovo is located on the south bank of the Maritsa River in Upper Thrace, thus geographically, palaeoenvironmentally, and culturally affiliating with the broader and dynamic cultural milieu of the Early Neolithic Karanovo I culture. Its long-lasting investigations, conducted within the context of various infrastructure projects, culminated in an exhaustive volume on the Early Neolithic strata from the site, which includes a chapter by the present author (Gurova 2014a; Roodenberg et al. 2014). The text presented here is an updated version, with full awareness that Yabalkovo represents a 'pearl' from the perspective of the representative formal tool component, one of the most significant and distinctive features of the Karanovo I–II *koiné* in the Early Neolithic industry.

According to its investigators, the cultural assemblage from Yabalkovo suggests a cultural attribution to the Early Neolithic Karanovo I horizon with a clear Anatolian influence (Leshtakov 2006; Leshtakov et al. 2007, 208). The absolute dates (published later) suggest the Early Neolithic occupation spanned the first three centuries of the 6th millennium cal BC (Roodenberg 2014, 448, fig. 2). Thus, the site has proven to be one of the most important, intriguing and rich (in material culture diversity) Early Neolithic sites in Thrace. The present author, based on personal research on important Early Neolithic flint assemblages from Bulgaria, has had several opportunities to highlight the significant role of the representative flint industry of the Yabalkovo site in the supra-regional context of Neolithization (Gurova 2008a, c; 2009; 2012a–b; 2018b; Gurova, Bonsall 2014a). A key feature of the site is that it possesses one of the richest and best assemblages of so-called formal tools (toolkits), which represent a hallmark of the Early Neolithic flint assemblages of the Karanovo I and II cultures in Bulgaria, as well as one of the characteristics of the supra-regional technocomplex of the Karanovo I–Starčevo–Criş–Körös cultural complex. The toolkits are characterized by long, regular blades with (bi)lateral, semi-abrupt to abrupt, high retouch and sometimes with rounded or pointed ends, as well as highly (re-)used sickle inserts. As noted in my publications, one of the most striking features of Early Neolithic formal toolkits is the uniform raw material from which they were made: the aesthetically pleasing Balkan flint, a high-quality, yellow-honey-brownish-greyish, white-spotted flint. Over a decade, interdisciplinary research focused on Balkan flint has gradually built a solid corpus of empirical data, based on archaeometric analyses of geological and archaeological samples. Yabalkovo's role in this analytical research will be summarized below. I had the opportunity to apply my conceptual approach to a small, yet representative, assemblage from the 2003 excavations in the Northeast sector, provided to me by the site's excavators. Due to the undoubtedly important aspects/nuances of this limited study, its results are presented here in more detail and with necessary updates, especially *vis-à-vis* the Balkan flint problem. On the other hand, the chipped-stone assemblage has been partially and later entirely published by R. Zlateva-Uzunova (Златева-Узунова 2025; Zlateva-Uzunova 2014), and some references to her descriptions and interpretations are necessary.

Use-wear analysis was accomplished with MBS 10 (x 100) and Leitz Orthoplan (Carl Zeiss Germany – x200) microscopes. The latter was used to take photomicrographs (at a magnification of x100) with an Olympus C50–60[1].

1 Photomicrogrpahs was accomplished in the University of Mining and Geology, using the available equipment. My gratitude to Dr S. Pristavova for this generous help.

The assemblage is considered and interpreted as a whole, despite several elements that appear to be exceptions to its homogeneous Early Neolithic character. These exceptions consist of the following: uncertain context (1 piece from the spoil heap and 2 from the survey); artefacts with contextual data, but made of Ludogorie flint and with morphometric and typological features intrinsic to a Chalcolithic flint production: three endscrapers on Chalcolithic blades (fig. 4.11–12), one retouched and one unretouched blade; two artefacts recovered from later structures (pits) but having diagnostic characteristics of Early Neolithic formal tools.

The general structure of the assemblage shows a disproportionate ratio between different flint categories, with a strong predominance of tools and a virtual absence of cores (Table 18).

Table 18

Entity	Tools	Blades	Flakes	Fragments	Varia	Total
Total	120	24	45	46	9	**244**

Table 18. General structure of the assemblage by techno-typological categories

Raw materials: Characteristics and procurement strategies

The formal tools of Balkan flint from Yabalkovo represent one of the best examples of such tools, being noticeably homogeneous and coherent in their macroscopic aspect, which aligns with the traditional description of Balkan flint (fig. 108.1–4). Together with other similar tools from Early Neolithic sites, they were used to argue that the category of formal tools is a hallmark of the Early Neolithic flint industry, as clearly stated in the first publication with this focus (Gurova 2008a). Since then, the Yabalkovo samples have been regularly used in the analyses aimed at shedding light on the provenance of the almost mythological Balkan flint. The first analyses revealed methodological limitations and suggested that more reliable, multidisciplinary research be conducted (Gurova, Nachev 2008; Bonsall et al. 2010). These initial studies also indicated that my intuitive impulse (based on visual resemblance) to envision Kriva reka flint in northeastern Bulgaria as a potential provenance area of the Balkan flint was incorrect, and the sources should be sought in the Moesian (*sensu* Nachev 2009) geological background. As mentioned in Part I, since 2011, several geological field surveys and systematic multidisciplinary laboratory analyses (macro- and micropetrography, as well as trace element analysis via LA-ICP-MS) have been undertaken, resulting in a series of publications with reliable data on the provenance and association of raw materials (including Balkan flint) with archaeological artefacts. It was undeniably geologically established that the Balkan flint originated in the chalk and limestone of the Upper Cretaceous Mezdra siliceous-carbonate Formation, with a significant outcrop cluster in the Pleven–Nikopol region (Gurova et al. 2016). Samples from Yabalkovo were regularly analysed in the context of scalar advancement of our empirical research and conceptual assessments (Gurova et al. 2016; 2022b; 2025). The analysed artefacts from Yabalkovo (Gurova et al. 2016, fig. 7.2; 2022b, fig. 4.5) have shown clear micropetrographic and geochemical affinity with the raw material from Balkan flint sources in the Pleven–Nikopol cluster and more precisely with the outcrops named Bohot Lake, Danube, and Zhernov (Gurova et al. 2016, fig. 14; 2022b). The Yabalkovo samples belong to flint group I distinct within 77 archaeological and 15 geological samples, and showing "…similar petrographic and geochemical features to the Balkan flint raw materials from the Upper Cretaceous Mezdra siliceous-carbonate Formation in the Pleven–Nikopol area (Gortalovo 1–2; Bohot lake B, Zhernov 1, 2A–2B, Danube A, B)" (Gurova et al. 2022b, 18, fig. 12.1). The pathways of Balkan flint distribution from the supply area to the Yabalkovo site were estimated and visualized by GIS application at c. 200 km (ibid., Table 2, fig. 15).

In her last publication on Yabalkovo flint assemblages (2025), Zlateva-Uzunova aimed to present the raw material spectrum and the main distribution patterns. However, she failed to acknowledge the limited number of serious analytical studies of prehistoric raw materials in Bulgarian literature, despite their close relevance to her research theme. It is also surprising that none of her descriptions of flint types implies Balkan flint, which is presumably well represented in the entire assemblage, at least in the typological repertoire. As for the other raw materials used in the context of an opportunistic *chaîne opératoire* (fig. 108.5), they should be much more diverse than I had the opportunity to see, and a geologist should confirm them. The fact that the site location is in the proximity of the "Maritsa riverbed and at the foot of a hill of Palaeogenic volcanic rocks" (Vangelov et al. 2014, 54) suggests easily accessible derivatives of volcanic rock genesis, such as chalcedony, quartz, and jasper.

Techno-typological analysis

The imbalance between the techno-typological groups (Table 18) is evident, contrasting with the normal empirical data from Neolithic settlements (see other case studies, for example). The typological tools account for half of the entire assemblage, while the debitage portion accounts for 47.1%. The techno-typological description and analysis are based on the following differentiation:

- typological tools (n=120);
- debitage products (n=115) consisting of:
    a) blades (all fragmented) (n=24);
    b) flakes (only entire pieces) (n=45);
    c) fragments (n=46) – distinguished as flake fragments (pieces with morphological parameters suggesting fragmented flakes, but without butts or proximal parts) and indeterminate fragments/chunks (in some studies, such pieces are termed debris).
- varia (n=9).

Typological tools

The typological tools (n=120) constitute a highly representative category of the entire flint assemblage. The typological subdivision is summarized in Table 19.

The typological tools make up almost half of the studied assemblage. Of the 120 tools, 105 (87.5%) are made of Balkan flint, and 68 (56.6%) belong to the formal toolkits spectra (fig. 108.1–4; 109–110). The formal toolkit from this site is among the richest and most impressive known Early Neolithic assemblages (comparable to the collections from Tell Azmak levels I–V). And we should keep in mind that this approach/analysis is applied to one portion of the whole assemblage, which, according to R. Zlateva, numbers 4683 artefacts (Златева-Узунова 2025). Unfortunately, there is almost no rational way of comparing the formal tool assemblage with the analyses of Zlateva-Uzunova, who used macroscopic descriptions of the raw materials and did not recognize either the formal tools as such, or even identify them by using the term 'Karanovo blades', introduced by Gatsov (2009).

The formal tools from Yabalkovo reveal one of the best examples of punch technique for detaching blades of 10 cm or more in length. The semi-abrupt to abrupt retouching is achieved by applying pressure with a soft, organic stick. Apart from formal tools, there are tools made of Balkan flint but without the typical features of formal tools, as well as a small group of tools made of other raw materials. For clarity, the three 'categories' of tools are presented separately in the table below.



Fig. 108. Flint artefacts from the 2003 season. 1–4 – formal tools of Balkan flint; 5 – products of the local expedient industry

Table 19

Category	Formal tools	BF tools	Other tools	Total
Blades with bilateral retouch /RB2	46	21	4	**71**
Blades with unilateral retouch/RB1	4	7	2	**13**
Perforators/borers on RB2	9			**9**
Endscrapers on RB2	6	1		**7**
Truncated blades	1	1		**2**
Simple endscraper		1		**1**
Burins on RB2	2			**2**
Notched blade		1		**1**
Double-pointed blade		1		**1**
Backed and truncated piece			1	**1**
Splintered tool			1	**1**
Retouched flake			1	**1**
Tool fragments		4	3	**7**
Chalcolithic endscrapers			3	**3**
Total	**68**	**37**	**15**	**120**

Table 19. Typological repertoire of the flint assemblage; RB2 – bilaterally retouched blade; RB1 – blade with unilateral retouch; BF – Balkan flint

The most frequent tool type in the entire assemblage is retouched blades – 84 examples. Most of them could be grouped in the category of formal tools/toolkit – blades with (bi)lateral semi-steep to abrupt retouch (50 items) (figs 109.1, 4, 7–9; 110.1–3, 7–9; 111.1, 3, 9). One of the bilaterally retouched blades possesses bifacial fashioning at the proximal and distal ends – the ventral bilateral retouch (with pressure flaking mode in the distal part) (fig. 109.6). The formal tools are followed by 'subproducts' of blades with high retouches: perforators/borers (nine ex.) (fig. 109.5–6), endscrapers (seven) (figs 110.2–3; 111.6, 8) and two accidental simple burins (fig. 110.5). It should be stressed that among the formal tools, endscrapers are usually fashioned on bilaterally-retouched blades and just front retouching is the criterion of their typological distinction. Among the rest of the typological spectrum, retouched blades of Balkan flint are well represented, followed by single examples of tools on blades such as truncated, denticulated, notched, double-pointed (fig. 111.2, 4, 10) and some more rare tools made of local raw materials: a backed piece, a splintered piece and a retouched flake. As mentioned at the beginning, there are three endscrapers with Chalcolithic features (high-quality raw material from Ludogorie), as well as morphometric parameters of the blanks–blades with Chalcolithic silhouettes and proportions (fig. 111.11–12).

Debitage products

- blades (n=24), they have all been removed from single-platform cores. There is only one intact specimen, and the ratio of fragments is as follows: proximal – eight, mesial – 14, distal

– two. Trapezoidal cross-sections predominate significantly over triangular ones. The blades' butts are usually flat/single blow and indicate indirect percussion by punch as well as direct percussion (presumably using a soft/organic) hammer. The dorsal ridge patterns and trapezoidal sections suggest advanced, well-maintained exploitation of single-platform cores, which are virtually absent. Among the blades, there is one made of Ludogorie flint with typical parameters of the Chalcolithic blade production – a large proximal fragment with a flat butt, regular parallel edges and ridges. The blade comes from square I37;

- flakes (n=45) are variable in shape and dimensions. As a whole, 'amorphous' flakes predominate with metrical parameters mainly between 1.5 and 4 cm, with one specimen larger than 6 cm and one smaller than 1.5 cm. The butts are large and flat, suggesting direct percussion with a hammerstone in the context of expedient production. There are 12 cortical flakes indicating involvement in a primary stage of the core preparation sequence (*mise en forme*);

- the group of fragments (n=46) comprises 22 flake fragments – pieces without proximal parts but with morphological data (shape and thickness) fitting to flake parameters, and 24 undeterminate fragments and debris. This group includes amorphous fragments whose association with a particular debitage category is unreliable.

As for the *chaîne opératoire*, there is no evidence of *in situ* preparation of blanks (blades) of Balkan flint, which subsequently might be transformed into formal tools. According to the 2003 season assemblage, the *chaîne opératoire* for formal toolkit production is entirely extrinsic for the site activity and knapping know-how. It is noteworthy that debitage categories include very few implements made from Balkan flint. This, as well as the considerable number of flakes and fragments of raw material variety, supports the hypothesis of expedient and opportunistic production, with a high consumption of the available medium-quality raw material (fig. 108.5). This conclusion is supported by Radka Zlateva's general observation on the *chaîne opératoire* of the chipped stone assemblage from the site (Zlateva-Uzunova 2014; Златева-Узунова 2025).

The category of **varia** (n=9) comprises a discoid resharpened hammerstone and 8 siliceous rock concretions with initial removals – unsuccessful exploration and/or knappable capacity testing.

Functional connotations

The use-wear analysis of all tools and blades identified 51 artefacts with microwear traces of use. The summary results are presented in Tables 20 and 21. It is striking and quite surprising that there is only one unretouched blade with an identified function (sickle insert) (fig. 111.7, 7a).

The most frequent use is attested on the formal tools/toolkit – 32 specimens (64% of all used items). Less numerous are other tools of Balkan flint – 15 pieces. Among the used tools, the most common are the blades with bilateral retouch – both formal tools and ordinary retouched blades of Balkan flint. In general, the used retouched blades number 34, which is more than half of all the used tools. In second place are the endscrapers and perforators/borers on blades with bilateral, steep, high retouch.

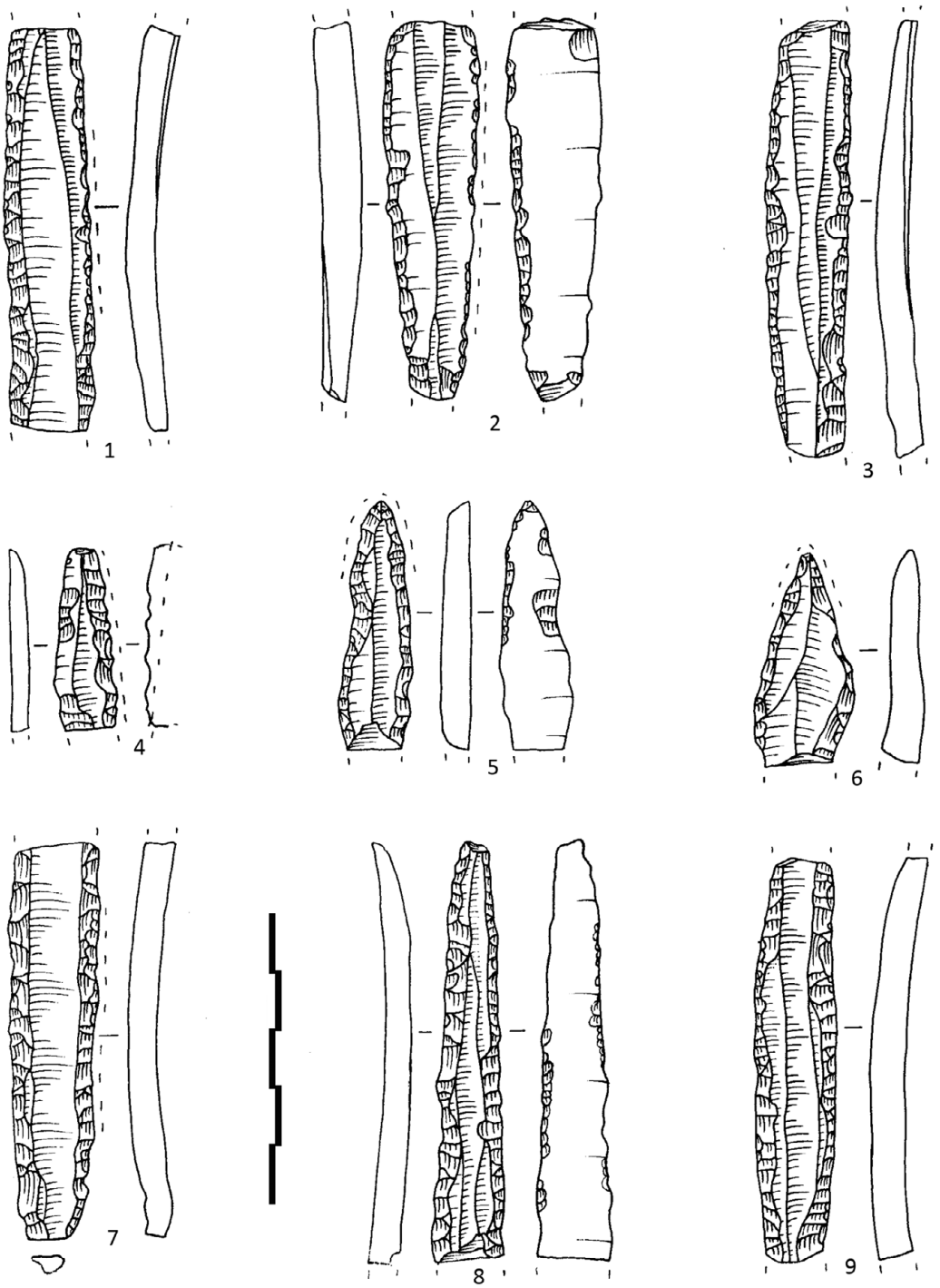


Fig. 109. Formal tools: blades with high, steep retouch (1–3, 7–9); borers on retouched blades (5–6); retouched lightly denticulated blade (4). Used edges are marked by dashed lines

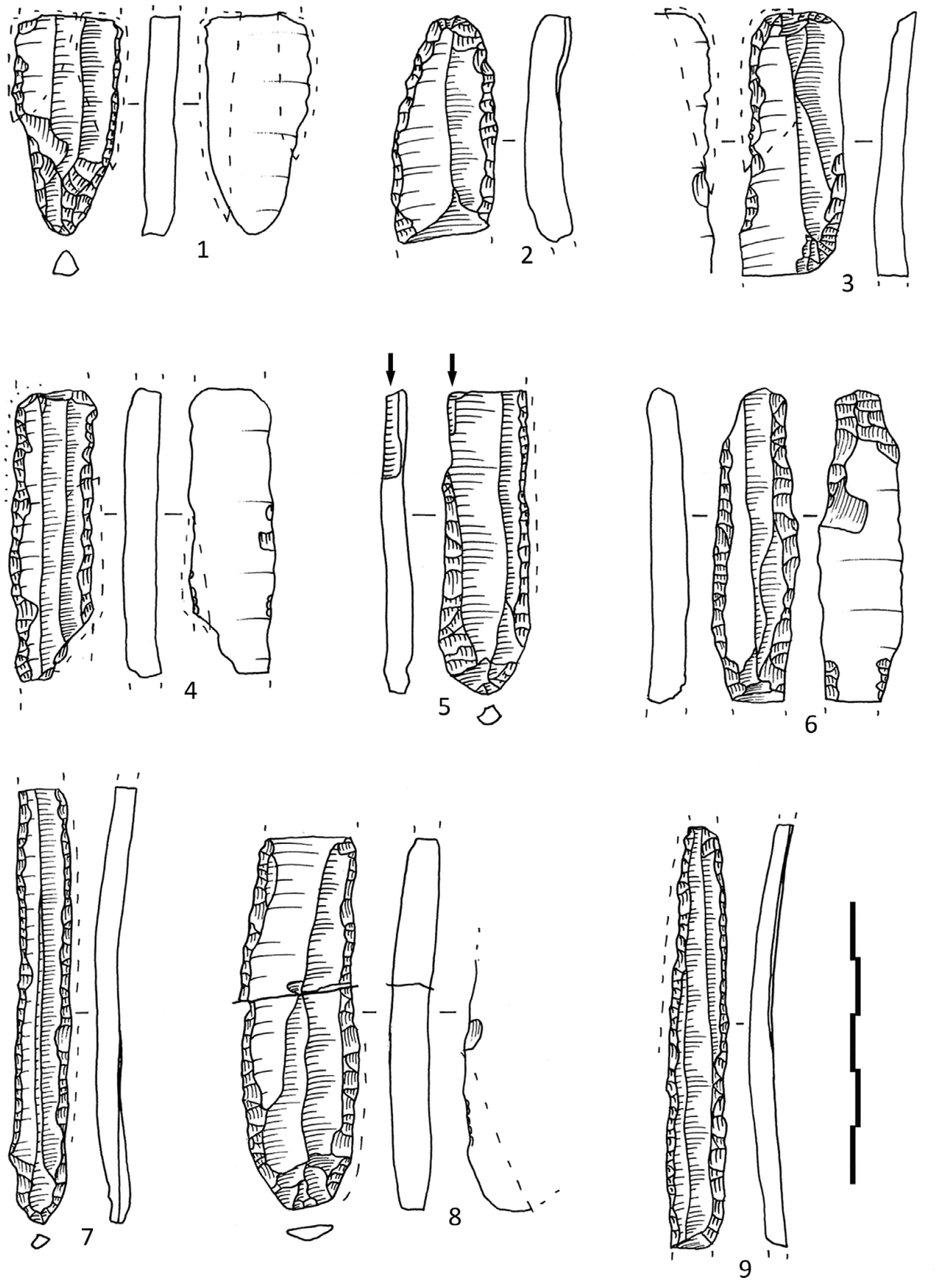


Fig. 110. Formal tools: blades with high steep retouch (1, 4, 7–9); endscrapers (2–3); burin (5); blade with bifacial flattening on the proximities (6). Used edges are marked by a dashed line

Table 20

Used tools	Formal tools	BF tools	Other tools	Total
Blades with bilateral retouch /RB2	19	8	1	**28**
Blades with unilateral retouch/ RB1	3	3		**6**
Perforators/borers on RB2	4			**4**
Endscrapers on RB2	4			**4**
Truncated blades	1	1		**2**
Simple endscraper		1		**1**
Burins on RB2	1			**1**
Backed truncated piece			1	**1**
Tool fragments		2	1	**3**
Tota	**32**	**15**	**3**	**50**

Table 20. Frequency of used tool categories

Table 21

Worked material	Formal tools	BF tools	Other tools	Blade	Total
Cereals	10	5	3	1	**18**
Other silica-rich plants	1	1			**2**
Wood	6	1			**7**
Bone	2				**2**
Hide	5	2			**7**
Meat/fresh hide		2			**2**
Soft stone/mineral	2				**2**
Combined function/reutilization	1				**1**
Relict polish	1	1			**2**
Undetermined material	4	3			**7**
Total	**32**	**15**	**3**	**1**	**51**

Table 21. Distribution of used artefacts by categories according to the worked material

The used implements reveal a broad range of worked materials, presented in Table 21. The prevalence of implements for cereal processing is pronounced and indicates that harvesting/ crop husbandry was the main, or one of the primary, subsistence activities. Palaeobotanical analyses reveal a rich cereal crop complex, similar to and transferred from the Anatolian one (Popova 2014, 416). Barley (*Hordeum vulgare vulgare* and *Hordeum vulgare var. nudum*), as

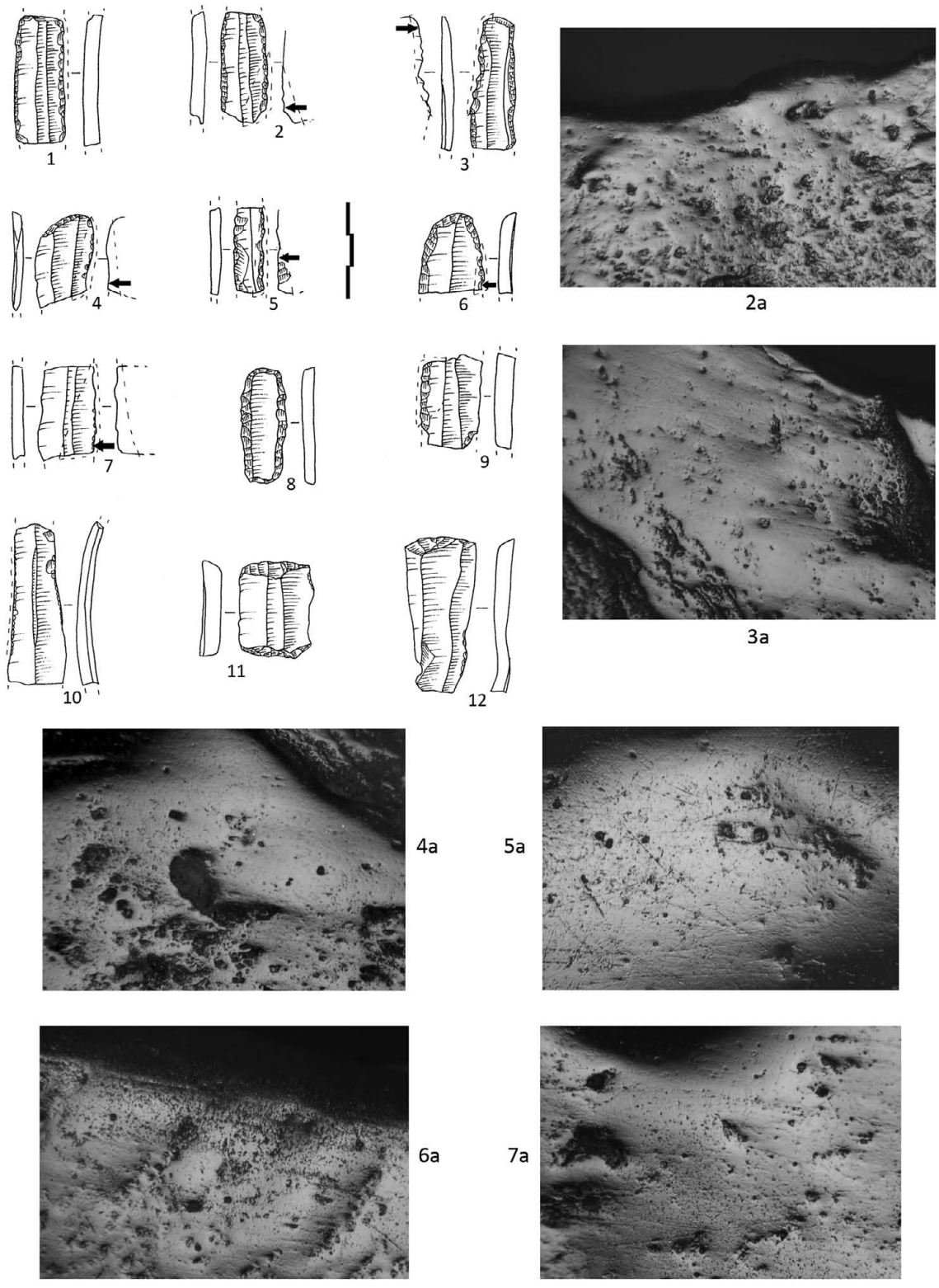


Fig. 111. Flint artefacts with traces of utilization: Used edges are marked by dashed lines; photomicrographs show a series of cereal polishes (x100) with variation of microfeatures and remains of post-depositional modifications (6d and 7a)

well as einkorn (*Triticum monococcum)*, three types of emmer *(Triticum dicoccum*, *Triticum aestivum compactum* and *Triticum* sp.), and millet *(Panicum milaceum*) have been identified among the crop remains, indicating a high level of agricultural activity practised by the farmers of Yabalkovo (ibid., 418). Sickle inserts are abundantly represented among the tools (mainly retouched blades) and are almost absent within the other flint categories. This fact is quite unusual compared with the harvesting toolkit of northwestern Anatolian sites, where sickle inserts consist mainly of unretouched blades, and even compared with other Early Neolithic Bulgarian sites, where the slight prevalence of retouched implements is attested (Gurova 2006, 160; 2008b). The sickle inserts have polishes ranging from long and slightly oblique (fig. 111.3–5) to typically angular, a characteristic feature of the Early Neolithic sickle of Karanovo type (fig. 111.2, 7, 9) (Gurova 2004b; 2012b; 2018a). Only two implements were used bilaterally. The microfeatures of the cereal polishes demonstrate a variability of microtopography, striation, smoothing and brightness likely due to the duration of use, condition of the crops and the variability of the *Cerealia* taxa, attested on the site (fig. 111.2a–7a). In some cases, a postdepositional chemical alteration is assumed, resulting in small chaotic pitting of the polish's surface (fig. 111. 6a–7a). It is worth emphasizing that some of the sickle inserts on retouched blades (formal tools) have been resharpened after their primary use in sickles. In some cases, the renewed edges remain unused, but the tool continues to be used in the same function despite the progressive dulling of the edges (fig. 111.3).

Considerably fewer are the tools possessing traces of wood and hide processing (7:7). Wood is attested on 6 formal tools with the following operations: drilling (x2), sawing (x2) and scraping (x2) (figs 109.7; 110.7). Very few tools reveal traces of other material, such as bone, meat, mineral, etc. It is worth emphasizing that functional interpretation of typical formal tools consisting of blades with bilateral high semi- to abrupt retouch is often difficult. This is due to successive resharpening, making the blades narrower and progressively removing the primary use-wear traces on their lateral edges. In the final stage of their 'biography', some of these tools appear irrationally transformed, i.e. exhausted.

Spatial distribution

An attempt to present the spatial distribution of formal tools, other tools of Balkan flint and other used implements is shown in figure 112, including some squares from the central part of the Northeast sector (Leshtakov 2014, 128, fig. 8.3). The data presented suggest 2 clusters/concentrations of tools in squares F–H 20–24 and I–J 31–37. There is no reliable evidence of specialized places for a particular activity or for storing a toolkit. The sickles, which are the most numerous tool category, are quite dispersed over the excavated area with only two vague concentrations — in squares H22–H23–G21–G22, where 5 sickle inserts are attested. Very few tools with use are clearly related to the Early Neolithic dwellings, which is an obstacle to eventual implications for the household system and organisation. More information is required to shed light on this problem.

General observations and discussion

The studied and briefly presented above assemblage is, of course, only a representative sample of the entire flint industry discovered on the site and presented recently in the way of traditional techno-typological descriptions, macroscopic qualification (incl. claims of provenance) of the raw materials and quite general, unargued and unproven cultural affinity with Anatolia,

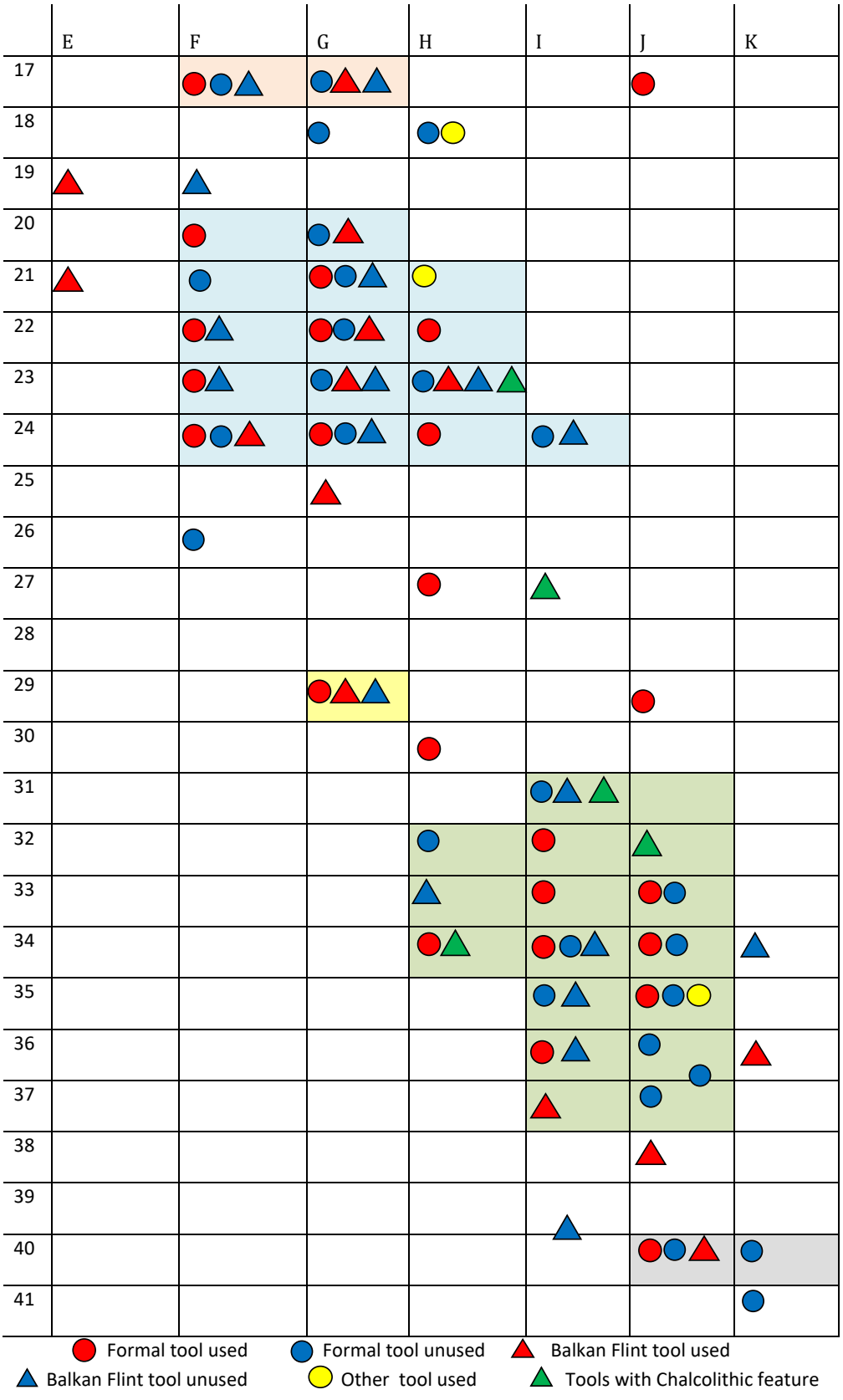


Fig. 112. Spatial distribution of different categories of artefacts in the squares

in the most general sense (Златева-Узунова 2025). It is surprising and sad that in this last paper, a decade after the primary publication in 2014 by the same author (Zlateva-Uzunova), no consideration of the significant advances in raw material research (and of accessible related publications) was incorporated, understood, or applied. Apart from the simplistic and practically useless descriptions and the far-fetched interpretation about supra-regional influences and interactivity, the assemblage remains deprived of its intrinsic background of the Early Neolithic *koiné*. In this sense, the sparse assemblage presented by me (Gurova 2014a) and updated here can be used as an additional and relevant trajectory to the Neolithization debate, at least through the lens of Balkan flint, which was an integral part of the extensive distribution network, as evidenced by Yabalkovo (*vide supra*).

Despite the clear awareness of the limited empirical basis of this study for whatever conclusions, some issues merit comment.

- The results suggest an expedient/opportunistic *chaîne opératoire* based on local and regional raw materials, which Zlateva-Uzunova described in her exposé but without a clear distinction in the scale of this 'regionality'.

- The topic of raw material supply and distribution should be separated into two lines/levels of analysis and interpretation. The first concern is the Balkan flint and the sequence of advancing and increasing multidisciplinary geoarchaeological research on it, which is regularly published with open access (Bonsall et al. 2010; Gurova 2012a; Gurova, Bonsall 2014a; Gurova et al. 2016; 2022a–b). In most of these publications, Yabalkovo is identified as artefacts (samples) and is incorporated into the conceptual framework. Additionally, GIS application, based on analytically demonstrated similarity/discrimination between the raw materials and artefacts, suggests distances between the geologically identified sources and the sites consumers, and Yabalkovo, which is concretely 119 km approximate distance from the Nikopol cluster of the Balkan flint sources (Gurova et al. 2022b, Table 2, fig. 15). In Zlateva-Uzunova's text, the provenance areas of the visually identified raw materials are mentioned: Upper Thrace, northern Bulgaria, Sredna Gora, the eastern and western Rhodopes. However, no geological evidence or analyses are provided, and it is noted that the distribution of raw materials in the Neolithic is rarely considered in specialised research (Zlateva-Uzunova 2025, 337)! None of the seven flint types described by Zlateva-Uzunova closely resembles Balkan flint varieties, and the absence of coloured images (which are ultimately required for documenting raw materials) means the raw material descriptions and codings are of minimal practical use.

- In contrast, the mass of typological/and functional tools are made of Balkan flint, and most of them could be assigned to the category of formal tools/toolkits. These toolkits from Yabalkovo are certainly an 'imported' phenomenon. As a consumer site, Yabalkovo imported Balkan flint blanks and finished formal tools. However, reading Zlateva-Uzunova's (2025) descriptions, it seems there is no indication of on-site Balkan flint core reduction.

- The functional analysis of flint artefacts demonstrates quite particular results with some affiliation/similarity with the functional data of the assemblages from the site of Kovachevo and divergence *vis-à-vis* some northwestern Anatolian studied sites (Gurova 2006). The field of functional connotations of the flint artefacts and the site's overall functionality requires further detailed examination and interpretation.

- Yabalkovo is the fourth Early Neolithic site where geometric microliths are recorded. Apart from this, Ohoden (Zlateva-Uzunova 2009) and Dzhulyunitsa (see Case study no. 2 in this book) in north Bulgaria possess geometric microliths, as does Kovachevo in the Struma Val-

ley (Gurova 2017b; fig. 33 here). It will be essential to compare these finds with their reliable contextual data and chronology to shed light on one of the ‘pre-Neolithic’ (at least theoretically) components of the flint industry and to attempt to explain their erratic appearance in the Early Neolithic. On the other hand, it will be a challenge to compare them with the much more numerous series of geometric microliths coming from secure Late Neolithic contexts (Gurova 2017b).

- Finally, the flint discs, to which Zlateva-Uzunova refers, represent scarce and significant artefacts with (still) no analogue in Bulgarian Neolithic assemblages. Seeking their Anatolian archetypes, she unfortunately failed to quote two sites in the Lake District where such finds are well presented: Höyücek (Balkan-Atlı 2005) and Kuruçay Höyük I (Baykal-Seeher 1994). These discs, as well as the so-called “heavy” endscrapers (mentioned for comparison with Ilıpınar assemblages; Златева-Узунова 2025, 340), have their precursors in the Lake District Anatolian *koiné*. Thus, Yabalkovo may indirectly be involved in the broader puzzle of Anatolian Neolithic diffusion from southwest Anatolia northward to northwest Anatolia and ultimately to the southeastern Balkans (Europe) – a problem that has engaged scientific discourse (Karul 2022).

2. LATE NEOLITHIC

2.1. CASE STUDY NO. 6: FLINT ASSEMBLAGE FROM HARMANLI

Introduction

The chipped-stone assemblage from Harmanli was published in 2010 together with the general contextual presentation of the site (Gurova 2010; Bacvarov et al. 2010). The site was excavated in 2004 as part of the rescue excavation campaign in advance of railway line construction. The settlement is located between two right tributaries of the Maritsa River, on the first terrace. The only archaeological features identified were three pits, suggesting to the excavators that the exploration had been done in the peripheral part of the site (Bacvarov et al. 2010, 135). The three stratigraphic layers, as well as the pit backfills, contained pottery dating to the Karanovo IV period – the final phase of the Neolithic cultural sequence. However, in the upper two stratigraphic layers, later material (seemingly from the transitional phase to the beginning of the early Chalcolithic Maritsa culture) was recorded (Бъчваров 2005; Bacvarov et al. 2010, 138–140). The chipped stone assemblage comprises 1445 artefacts and has fundamental characteristics of the Late Neolithic industry, which is why it is presented here in a slightly restructured version (for easy comparison with the other case studies). In terms of horizontal stratigraphy, the material from the cultural deposit in 11 investigated squares prevails (94.5% of all finds), in contrast to the limited finds from two pits: Pit 1 (n=23), Pit 2 (n=35), and from the surface (n=21). The surface material contains four typologically characteristic tools, typical of the Late Neolithic flint industry, which have not been excluded from the total number of tools in the general statistics. The same applies to two endscrapers from Pits 1 and 2. Two artefacts from Pit 1 are morphometrically different from the remaining "flint fill": this is a tool fragment – a transversely and longitudinally fractured Chalcolithic blade of a raw material which undoubtedly originated in northeastern Bulgaria (Ludogorie flint), as well as a fragmented blade (sickle element) whose raw material has no direct relation to northeast Bulgaria; however, according to its morphometric parameters the blade is indicative of Chalcolithic debitage technology. These several artefacts could belong to the beginning of the Chalcolithic Maritsa culture.

Table 22

Artefact categories	From sectors	Pit 1	Pit 2	Surface	Total
Typological tools	89	2	1	4	**96**
Blades	86	1	1		**88**
Flakes	353	5	11	4	**373**
Fragments	647	6	15	8	**676**
Small flakes and retouch flakes	105	3	3	4	**115**
Cores	11	1			**12**
Varia	74	6	4	1	**85**
Total	**1365**	**24**	**35**	**21**	**1445**

Table 22. General structure of the assemblage by techno-typological categories

The chipped-stone assemblage was subjected to techno-typological and functional analyses and interpretation. Use-wear analysis was conducted with microscopes MBS 10 (x100) and Leitz Orthoplan (Carl Zeiss Germany – x200). The latter is equipped with a digital camera (Olympus C50-60), which was used to take the photomicrographs at a magnification of x100[1].

The general structure of the assemblage by context is presented in Table 22 above, showing the clear dominance of debitage products, among which blades are surprisingly scarce.

Raw materials: characteristics and procurement strategies

The raw materials from the site were distinguished based on the routine practice of the time (before the author initiated the rigorous scientific approach to raw material study) – macroscopic descriptions of features such as texture, colour, transparency, compactness and homogeneity, presence of inclusions, and fracture type. Among 30 types superficially distinct with no need to be described here, it was highlighted that the typological tools and blades vary within the broadest range of raw materials; less varied but more comparable are the raw materials of the cores and the other groups of debitage products (except for the blades). Consultation with a mineralogist[2] led to the unification of the raw materials into several main groups: flint (*sensu stricto*), opal-chalcedony, chalcedony, jasper, quartz, effusive rock and volcanic tuffs. Chalcedony and jasper (in green and yellowish-brown colours) are the most common among the artefacts of the collection. The range of raw materials corresponds to the Eastern Rhodope volcanic rocks, rich in jasper and chalcedony veins, which were the focus of a specialized geoarchaeological study (Кънчев и др. 1981; Начев, Кънчев 1990). In more recent publications, they are qualified as "atypical flint from south Bulgaria", whose genesis and outcrops are associated with the Rhodopes and Sredna Gora tectonic zones (Начев 2009, 14–15). As far as the strategy of raw material procurement of the investigated site is concerned, the location of the site on a terrace between tributaries of the River Maritsa, whose catchment basin contains alluvial-diluvial sediments with easily accessible redeposited materials from Palaeogenic flint rock masses, which are widely spread in the Plovdiv district and the Eastern Rhodopes[3]. Theoretically, this suggests a direct, local and regional system for the supply and distribution of raw materials suitable for expedient industries. For the sake of simplicity, the widely accepted (among prehistoric archaeologists) term "flint" is used for the raw material characteristics of the whole artefact assemblage. An additional disadvantage for the raw material part of the study was that the publisher's restrictions permitted only black-and-white photographs, thereby preventing adequate presentation of the raw material in colour.

Techno-typological analysis

As mentioned, there is a severe imbalance between the techno-typological groups (Table 22); the debitage products account for 86.6% of the assemblage, compared to tools (6.6%) and blades (6%). The techno-typological description and analysis are based on the following classification:

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1 I would like to thank my colleagues from the University of Mining and Geology-Sofia who offered me the opportunity to use their technical equipment.

2 I am indebted to Chavdar Nachev for his valuable and competent information.

3 The author works with materials from a number of Eastern Rhodopes sites with a different cultural affiliation, and gained the impression of a consistent and similar approach of the later prehistoric inhabitants to their regional natural resources and use.

- typological tools (n=96);
- debitage products (n=1252) consisting of:

a) blades (all fragmented) (n=88);

b) flakes (only entire pieces) (n=373);

c) fragments (n=676) – distinguished as flake fragments (pieces with morphological parameters suggesting fragmented flakes, but without butts or proximal parts) and undeterminate fragments/chunks (in some studies, such pieces are termed debris);

d) small flakes and retouch spalls (n=115).

- cores (n=12);
- varia (n=85).

Typological tools

The typological repertoire is quite rich, with a significant imbalance among the various groups, as shown in detail in Table 23.

Table 23

Tool category	From sectors	Pit 1	Pit 2	Surface	Total
Endscrapers on blade	16	1	1	1	**19**
Endscrapers on flake	13			3	**16**
Retouched blades x 1	14				**14**
Retouched blades x 2	10				**10**
Retouched flakes	10				**10**
Perforators/borers	4				**4**
Truncated blades	2				**2**
Truncated flakes	2				**2**
Combined tools	3				**3**
Geometric microliths	3				**3**
Notched blade	1				**1**
Fragment of a tool	9	1		2	**12**
Total	**87**	**2**	**1**	**6**	**96**

Table 23. Tool categories by context differentiation

- endscrapers (n=35), of which 19 are on blades, 16 (including three semicircular) on flakes (figs 113.3, 9–11; 114.1, 3–7; 115.11–16; 116.1–6, 8–9; 117.5, 8, 10; 118.7). Most of the endscrapers on flakes, and some on blades, are small, measuring less than 2 cm long. Their fronts range from semi-convex to almost straight and in some instances resemble *à museau* (fig. 113.9. 11). There is one double endscraper of small size (fig. 113.3). The small endscrapers represent one of the diagnostic features of the microlithization of the Late Neolithic flint industry. According to the morphometric indices of the blanks on which they were shaped, at least two tools resemble endscrapers on Chalcolithic blades (figs 114.1;118. 5). They originate from the squares but were found in the plough zone: the endscraper in fig. 114.1 is from sq 11, found at

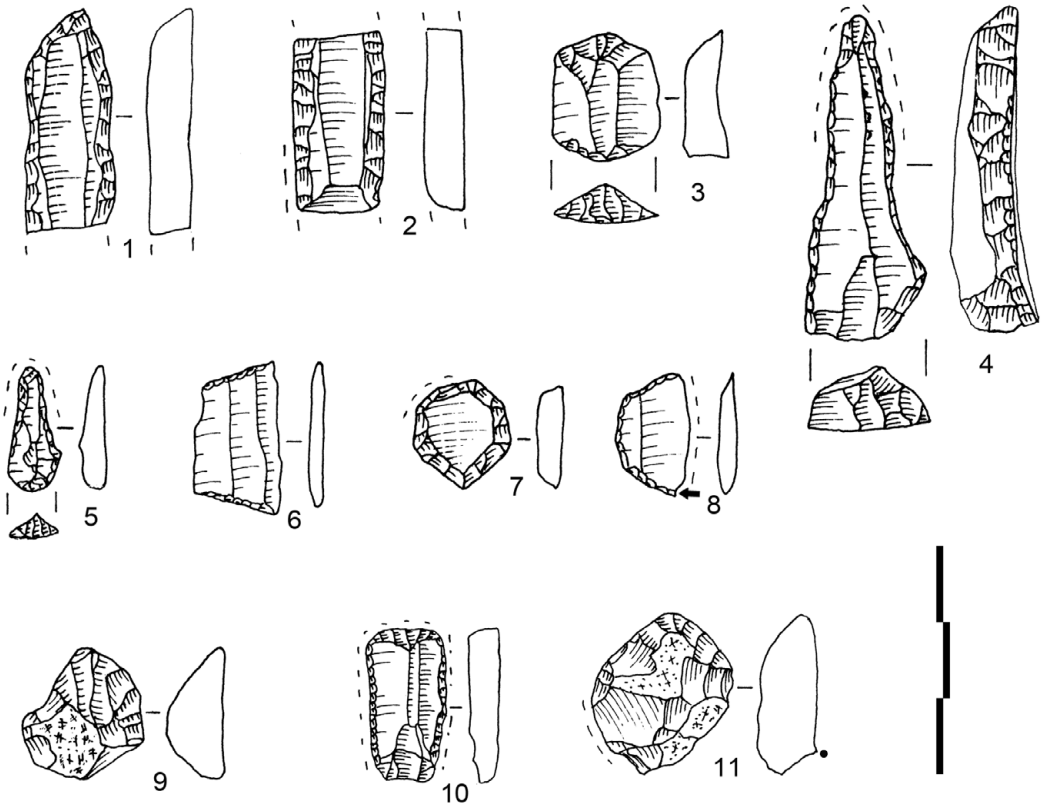


Fig. 113. Typological tools; used edges are marked by a dashed line; the arrow shows photomicrograph in fig. 122

a depth of 30 cm and the tool in fig. 6.5 is from sq 10 found at a depth of 10–20 cm. Although the first find probably comes from the second stratigraphic layer, the affiliation of both artefacts to the Karanovo IV culture is problematic; more likely, they belong to the Chalcolithic context;

- retouched blades (n=24) with a ratio of bilateral to unilateral retouch of 10:14. All blades are fragmented, and the retouches vary from fine marginal and irregular to continuous, semi-abrupt and almost lamellar (figs 113.2; 115.2, 4, 6–10; 116.12; 117.1, 2, 4; 118.4, 9, 11). In rare cases, the retouch is on the ventral surface and only in one case is it alternating (fig. 118.4). Although it will be discussed later, here it should be pointed out that some of the retouches are irregular and resemble the cases of '*outil à posteriori'*, i.e. a retouch acquired as a result of blade utilisation. In these cases, microscopic observation showed no detectable use-wear traces on the edges. Therefore, it is more reasonable to interpret them as intentionally shaped. It is interesting to note that one of the blades with bilateral retouch (fig. 113.2) is made of Balkan flint and typologically can be associated with the diagnostic formal tools attributed to the Karanovo I and II cultures in Thrace (see Гюрова 2005; Gurova 2002a; 2004a; 2008a, c; 2012b; 2018b; Gurova, Bonsall 2014a; also Part I in this book). The fact that it was discovered in this assemblage points to possible connections with the contemporary cultures in northwest Thrace, where such tools were encountered as reminiscent forms until the Late Neolithic phase (Gurova 2004a). The other possibility is that the tool was introduced into the layer from the surface and is associated with an Early Neolithic site in the region. Whatever the explanation, it has no "genetic" relationship to the mass elements in the assemblage;

- retouched flakes (n=10), varied in shape and type of retouch (figs 116.7; 117.6; 118.3);

- perforators (n=4), three on blades (figs 113.1; 115.1, 3) and one on a flake (fig.117.7). The

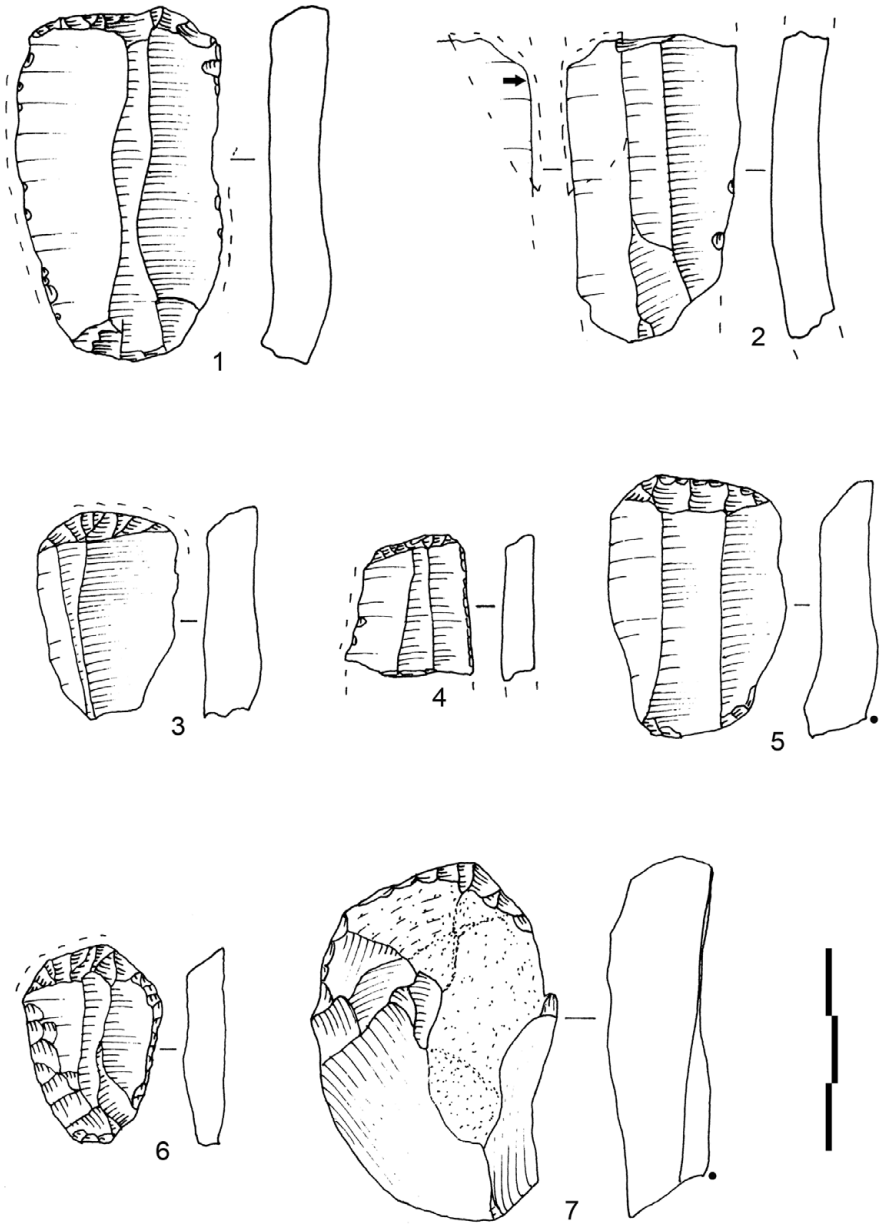


Fig. 114. Typological tools (1, 3–7) and an unretouched blade with use-wear traces (2); the arrow shows photomicrograph in fig. 122

above-mentioned observation regarding the formal tools of Balkan flint applies to the perforators in figures 113.1 and 115.1: namely, the similarity of raw material and typological features to the characteristic repertoire of the Early Neolithic cultures in Thrace, as well as the comment on their possible occurrence in the assemblage under study. One of the tools is an atypical borer (made on a second series trimming blade) with several flat ventral negatives at the distal end (fig. 115.3);

- truncations (n=4), two on blades (figs 116.11; 117.11) and two on flakes (fig. 116.10). The truncated edges are differently shaped: in one case, with a high retouch resembling the front of an endscraper but more oblique (fig. 116.10), and in another with fine semi-abrupt retouch (fig. 116.11);

- combined tools (n=3), two of which combine a perforator and truncation (fig. 113.4) and a

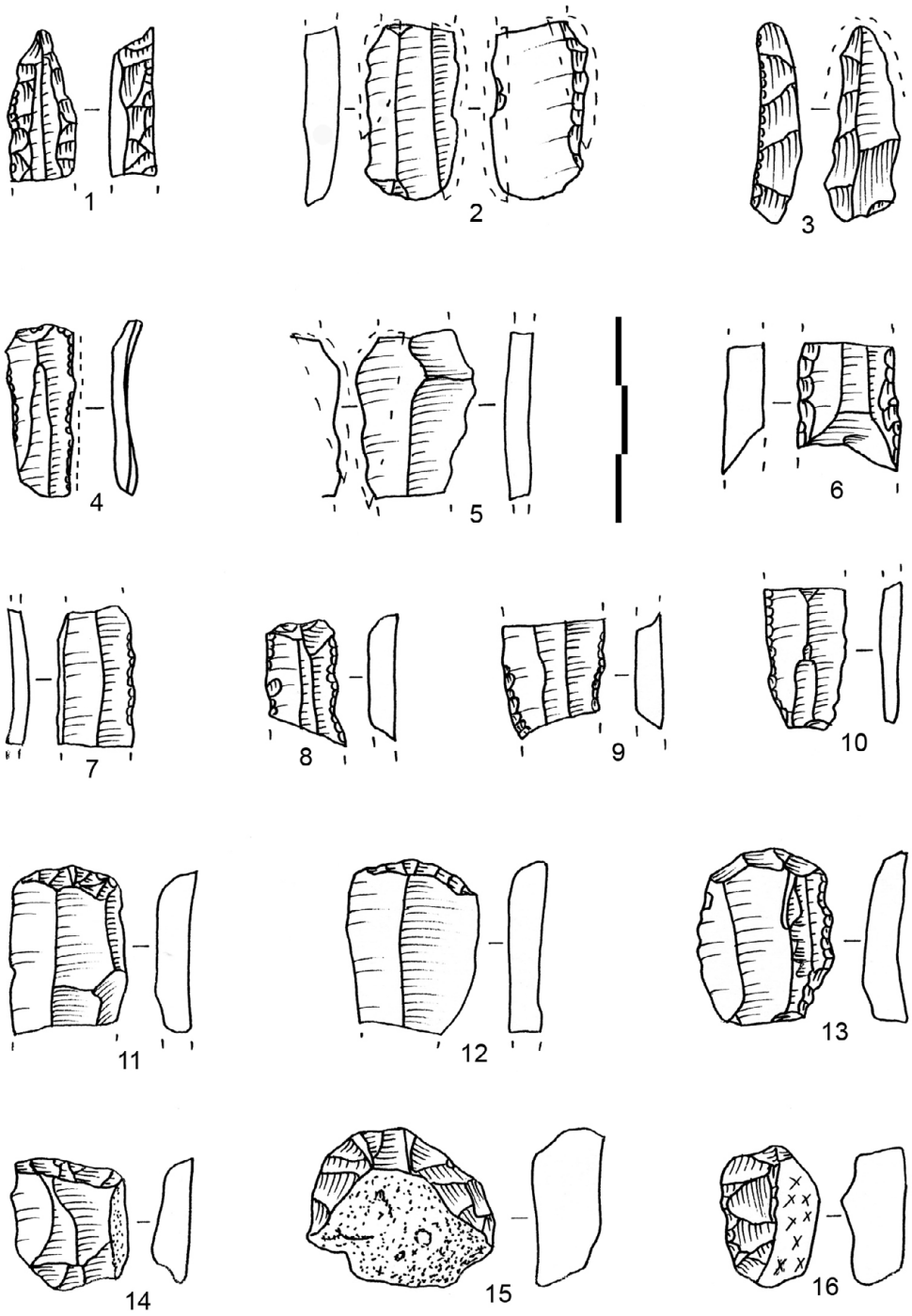


Fig. 115. Typological tools (1–4, 6–16) and an unretouched blade with use-wear traces (5). Used edges are marked by dashed lines

perforator and endscraper (fig. 113.5), respectively. The divergence in the metrics of the two typologically similar tools is astonishing. In both cases, the retouches are abrupt and cover almost the entire longitudinal edges, and the working parts are at the tips of the perforators and not the truncated opposite ends. The third tool combines an endscraper front in its distal part with an oblique, abrupt truncation at the proximal end of the blade;

- geometric microliths (n=3). This small series of microliths is highly diagnostic for both the cultural-chronological affiliation of the assemblage and the supposed availability of hunting

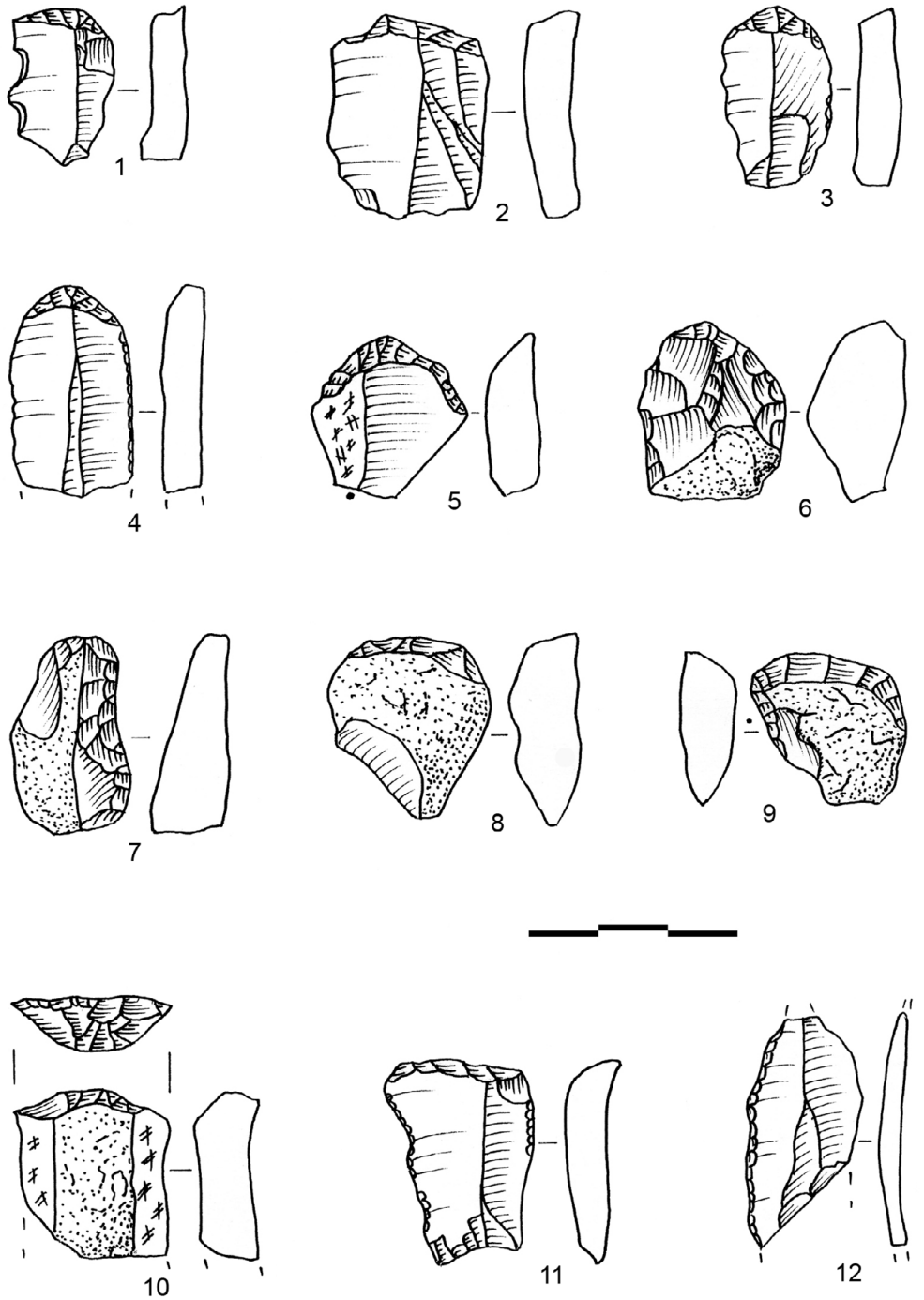


Fig. 116. Typological tools without use-wear traces

weapons in the settlement's arsenal. The segment and the trapeze are shaped with fine, abrupt retouch (fig. 113.6, 8). The third microlith is interesting and somewhat unique as it represents a tool with continuous semi-abrupt retouch along the entire perimeter, forming a pentagon/pentahedron (fig. 113.7). Given the evidence (mainly in Upper Thrace) of series of geometric microliths in Late Neolithic cultural assemblages, they can be considered an element/feature of the microlithisation of the flint industry during the Late Neolithic. My opinion on the Late Neolithic microlithic components (Гюрова 2005; Gurova 2004b; 2017b) aligns with the concepts of other investigators of Neolithic culture in Thrace (see, for example, Lichardus et al. 2000);

- notched blade (n=1) – it is a delicate notch made on the proximal part of the blade (fig. 117.9);

- tool fragments (n=12) – they mainly comprise tool parts with clear retouches, but it is impossible to determine the tool shape and type.

Debitage products

- blades (n=88) – all removed from single-platform cores (figs 114.2; 115.5; 116.3; 117.1–2, 5–6, 8, 10). There are only three intact specimens, and the fragment ratio is as follows: proximal – 36, mesial – 44, distal – five. The intact three blades are about 3 cm in length (the largest measures 3.5 x 0.9 x 0.5 cm). The width varies from 0.5 to 0.9 cm, and the thickness from 0.1 to 0.8 cm. The ratio of trapezoidal to triangular cross-sections is 59:29. The butts are broadly similar: in 30 cases, they are flat (single blow), unreduced and with a ventral angle of ≤ 90°. These parameters, such as the regularity of edges and the parallel dorsal negatives and arises, indicate the use of debitage produced by the punch technique. Unfortunately, no bladelet series with preserved butts is available to demonstrate the presumed pressure technique used in the bladelet core reduction system. There is no unequivocal evidence for the use of direct percussion with a soft organic hammer and even less for the pressure technique (Inizan et al. 1995, 75–77). Single blades have prepared (three), broken (three), natural (two) and linear (one) butts;

- flakes (n=373) with a clear dominance of specimens 1.5 to 4 cm[4] long (n=351). The corticated flakes number 83, of which 17 have an overall cortex covering, while 50 have patinated surfaces. The flakes vary in shape, but the category as a whole can be termed 'amorphous'. The butts are flat, followed by natural, broken and, rarely, linear butts, while the prepared butts are isolated cases. The various butt types and the fact that most ventral angles are > 90° are clear indicators of the direct percussion technique using a hammerstone, characteristic of flake debitage and, more broadly, of industries with opportunistic and expedient production, as discussed further below. It is worth noting that even without conducting a special investigation, five cases of refitting in squares 4, 7, 8, 10 and 11 were identified;

- fragments (n=676) of which 251 are flake fragments. Within this group, the number of specimens with patina and cortex is very small. The undeterminate fragments (chunks and chips) are numerous (n=425) and comprise unified amorphous fragments whose association with a particular debitage category is unreliable. Their considerable number supports the hypothesis of expedient, opportunistic production, with high consumption of the available medium-quality raw material;

- small flakes and retouch flakes/spalls (up to 1.5 cm) – (n=115 with a ratio of 83:32). This category unites artefacts according to their metric characteristics. However, as elements of *chaîne opératoire*, they constitute a non-homogeneous group: the small flakes are the product of debitage during the process of maintaining and optimizing core parameters, but could be produced purposefully (for subsequent use?). As is evident in the studied assemblage, there are cores specifically adapted for the production of small flakes (fig. 121.1, 2). Unfortunately, there are no indications of the use of this artefact category, although 30 were microscopically analyzed. The retouch spalls (tiny flakes produced by retouching) are the final products of tool fashioning and resharpening. They are evidence of on-site production or, at least, of repairing and resharpening the tools during their use.

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4 To recall that the metric approach to flakes was adopted from the precise and effective method of investigation applied by my colleague Dr Stefanka Ivanova.

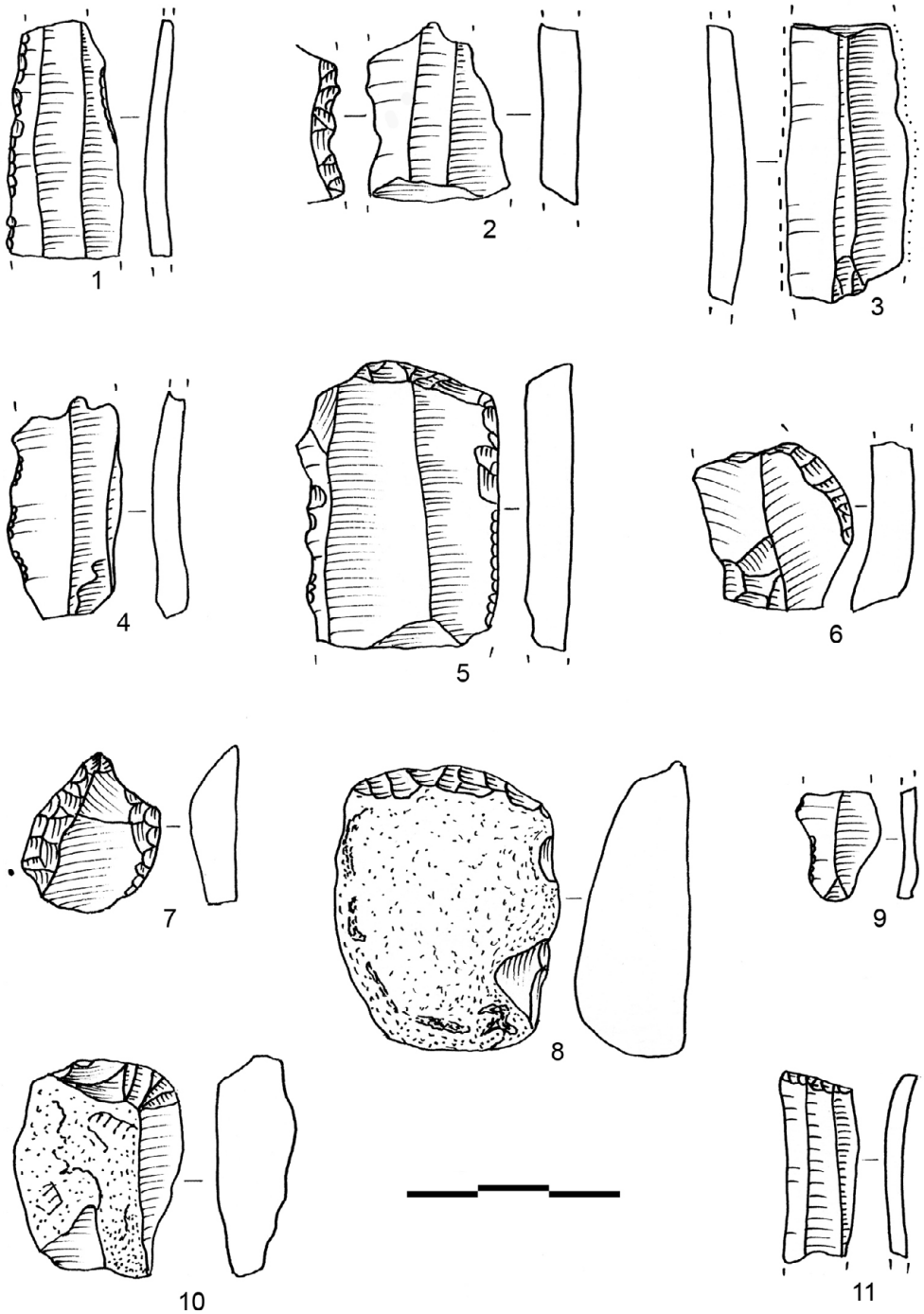


Fig. 117. Typological tools without use-wear traces (1–2, 4–11) and an unretouched blade with use-wear traces (3). Used edges are marked by dashed lines

Cores (n=12) – most are in an advanced stage of exploitation, but with a properly maintained core angle and debitage edge, making them potentially usable. Six cores are for bladelets, four with a single striking platform (fig. 120.2, 3) and two with multiple platforms (with changed orientation) (fig. 119.1, 2). Two of the cores are metrically on the borderline between blades and bladelets as the lengths of the negatives are ~3 cm, and the widths are < 1 cm. The small bladelet cores are another indicator of the general microlithization of the flint industry, although the removal technique is difficult to reconstruct from the core parameters and stigmata. However, pressure blade debitage is theoretically recognizable. The other six cores are single-

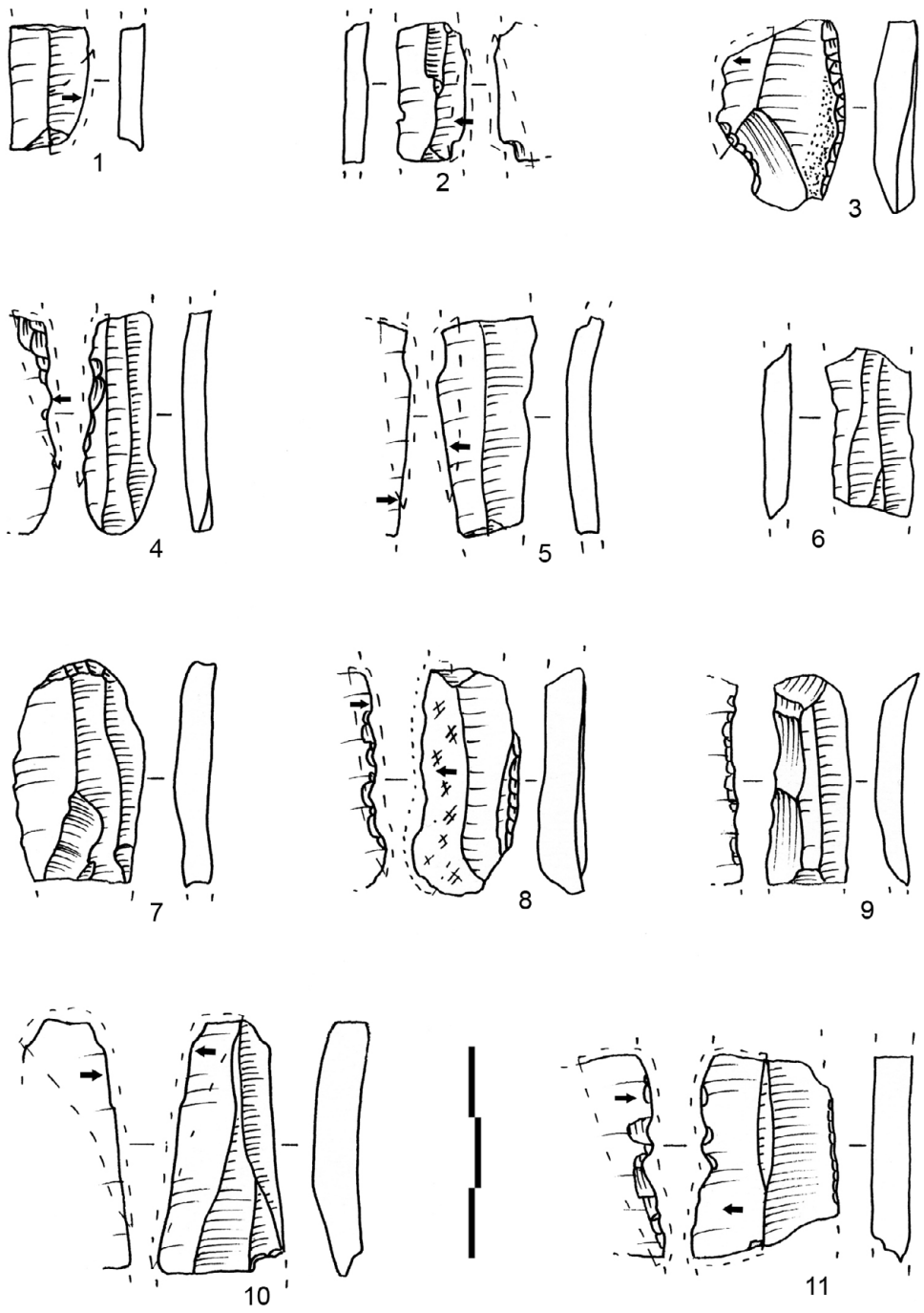


Fig. 118. Typological tools (3–4, 7, 9, 11) and unretouched blades (1–2, 5–6, 8, 10). Used edges are marked by a dashed line; the arrows show photomicrographs in figs 122–124

platform: one for blades (fig. 120.1); two for blades and flakes (figs. 120.3–4); two for flakes, as one is on a flake, and the other on a flat concretion of the types mentioned below (fig. 121.1). Particularly interesting is a core for small flakes with a striking platform on a natural surface and a circular removal/flaking surface (fig. 121.2). This artefact could be characterized as a kind of *raclette* but its singularity and the observations on the assemblage as a whole (especially the large number of concretions in the group of varia) point to its interpretation as a small core, if an unusual one.

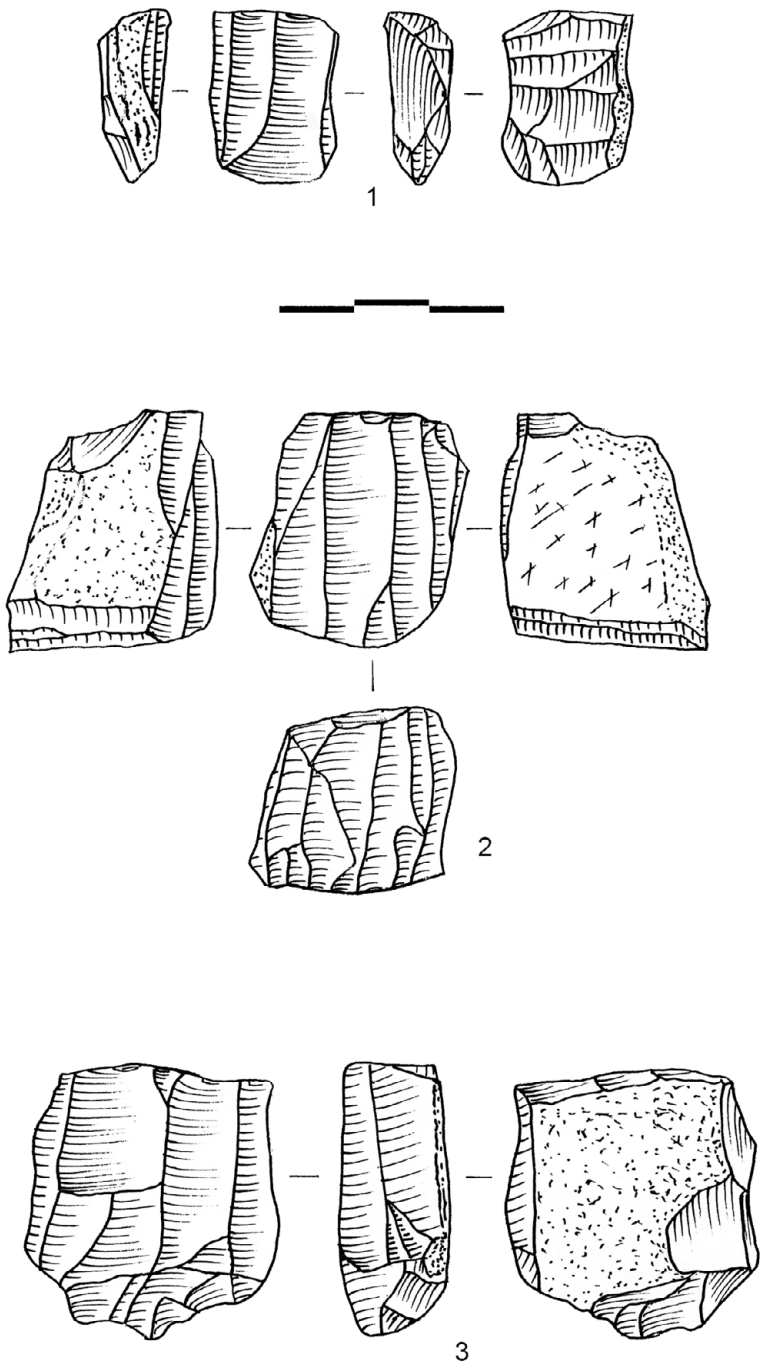


Fig. 119. Cores: single-platform core for blades (3); core with changed orientation for blades and bladelets (1–2)

Varia (n=85) include flint concretions that show evidence of the initial stage of the *chaîne opératoire* within the site (in fact, on its periphery according to the excavators' observations). The flat flint concretions obtained from the river beds were subjected to raw material testing and the beginning of knapping, but did not reach the stage of pre-cores. The possibility of special expeditions to extract chalcedony from the massive volcanic rocks on the Rhodope slopes is neither improbable nor easily provable.

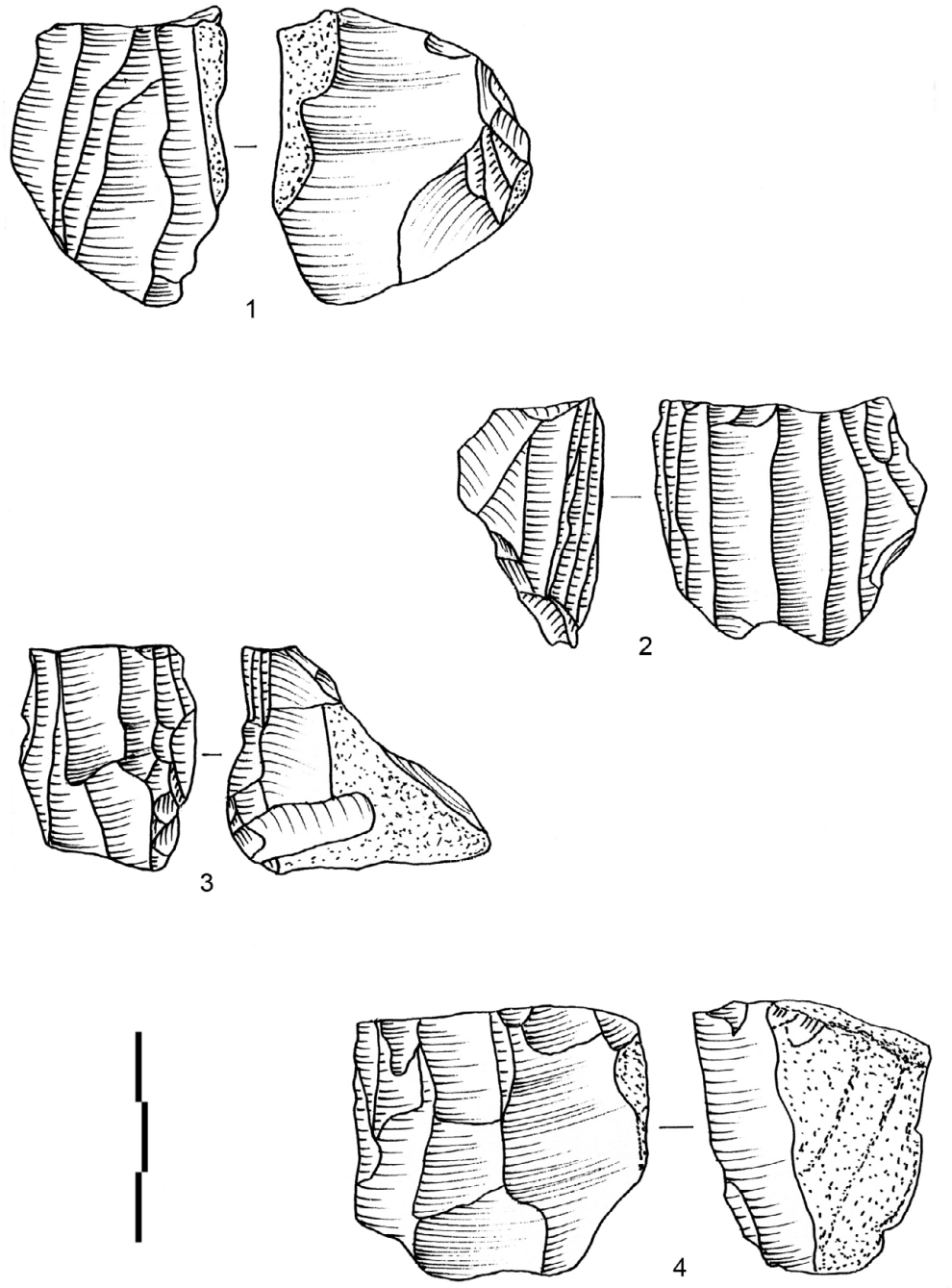


Fig. 120. Single-platform cores: for blades and bladelets (1–3), and for blades and flakes (4)

Functional connotations

Following a detailed visual analysis, 320 artefacts were subjected to specialized microscopic observation: all typological tools and blades, as well as 100 flakes and 36 flake fragments whose morphological features did not preclude their use and eventual hafting. Use-wear traces were identified on 35 artefacts: 20 typological tools, 13 blades and two flakes. Their distribution by type of worked material is presented in Table 24.

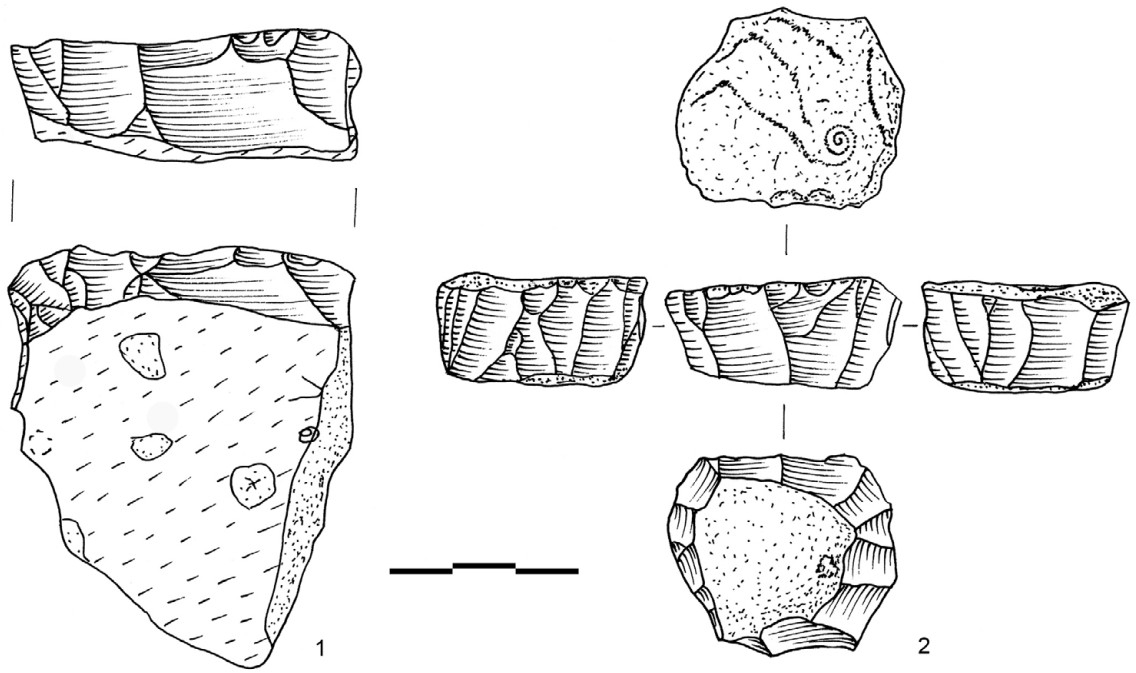


Fig. 121. Cores for small flakes on flat concretions

Table 24

Worked material	Tools	Blades	Flakes	Total
Cereals	5	9		**14**
Other plants		2		**2**
Meat/fresh hide		2		**2**
Hide	8			**8**
Bone	3			**3**
Wood	1			**1**
Pottery (clay)	1			**1**
MLIT[5]	1			**1**
Hammer stone			2	**2**
Undetermined m-l	1			**1**
Total	**20**	**13**	**2**	**35**

Table 24. Distribution of used artefacts by categories according to the worked material

The typological tools with identified functions consist of seven endscrapers of which five are made on blades, and two on flakes. Their functional identification is as follows: four tools were used for hide processing: scraping – two (fig. 114.3, 6); scraping and bilateral cutting (fig.

5 MLIT – Micro Linear Impact Traces on projectile points.

113.10); and cutting (fig. 114.1). Local bone scraping has been recorded on two specimens (figs 113.11; 114.4). One endscraper on a blade was a sickle element – its working part is the proximal end of the right edge. The retouched blades with use-wear traces also number seven. They can be distinguished as follows:

- blades with bilateral retouch (n=3) used for cutting hide (fig. 115.4); as a sickle insert (figs 118.11; 122.3–4); and as a tool for wood sawing (fig. 113.2). The latter is interesting for two reasons: typologically and in terms of raw material it can be related to the diagnostic repertoire of Early Neolithic Karanovo I and II cultures in Thrace; the proximal breakage occurs after the primary use and partly removes the use-wear traces;

- blades with unilateral retouch (n=4), with the following functions: sickle inserts – two artefacts (figs 115.2; 118.4; 123.5); lateral hide scraping – two, in both cases the working edge is the retouched one.

Geometric microliths (n=2) with the following use-wear traces: the segment shows the typical MLIT set of traces (see footnote 8) and most probably served as a transverse arrowhead (figs 113.8; 122.1). The second artefact is of a rarely encountered type, a pentahedron retouched along the entire perimeter (fig. 113.7). Notably, the exposed point was not used, and there is non-diagnostic polish on two of the surrounding edges. The worked material cannot be determined.

Combined tools (n=2); the identified function of the perforator/endscraper is hide perforation (fig. 113.5); the perforator/truncation shows wear from pottery perforation (fig. 113.4). There are no signs that the truncated edges opposite to the tips were put in a handle or hafted.

Atypical borer is used for drilling bone, and the ventral distal negatives may be due to its use (fig. 115.3).

A retouched flake was used as a sickle insert with one working edge (figs 118.3; 124.2).

Debitage products

- blades (n=13). All used blades were fragmented before use; 12 of them are mesial fragments, and only one is a proximal fragment. Only two blades were used bilaterally and were components of composite knives for cutting meat/fresh hide. Two artefacts were used unilaterally for cutting plants but not cereals; one of the blades is slightly smoothed along the right edge, which may relate to fixing it into a straight axial handle (fig. 117.3). The other 9 mesial fragments served as sickle inserts. The working sections are elongated-angular and in 7 cases are located distally on the left edge (figs 114.2; 115.5; 118.5, 8, 10) and in two cases on the right edge proximally (fig.118.1, 2). In one case of a blade with patina on the left negative dorsally, there are noticeable ventral use-wear negatives that only appear to resemble irregular retouch (fig. 118.8). Within the studied collection, this is a rare case of unambiguous identification of use-related chipping, in contrast to artefacts with irregular micro-retouch where intentionality is inferred from the absence of diagnostic use-wear traces. Morphometrically, only one blade differs from the others in its large dimensions, resembling those of Chalcolithic blades (fig. 114.2). It originates from Pit 1, which is an additional argument against its possible affiliation with the cultural identity of the materials from the site. The range of cereal micropolishes (figs 122.2; 123.1–4, 6) and 124.1, 3–4) shows variations in the polish's texture itself and the degree of its linear features (striations). The polish nuances may be due to the cereal type, its ripeness, the raw material type (cryptocrystallinity of artefacts) or the position of the flint element in the curved sickle handle.

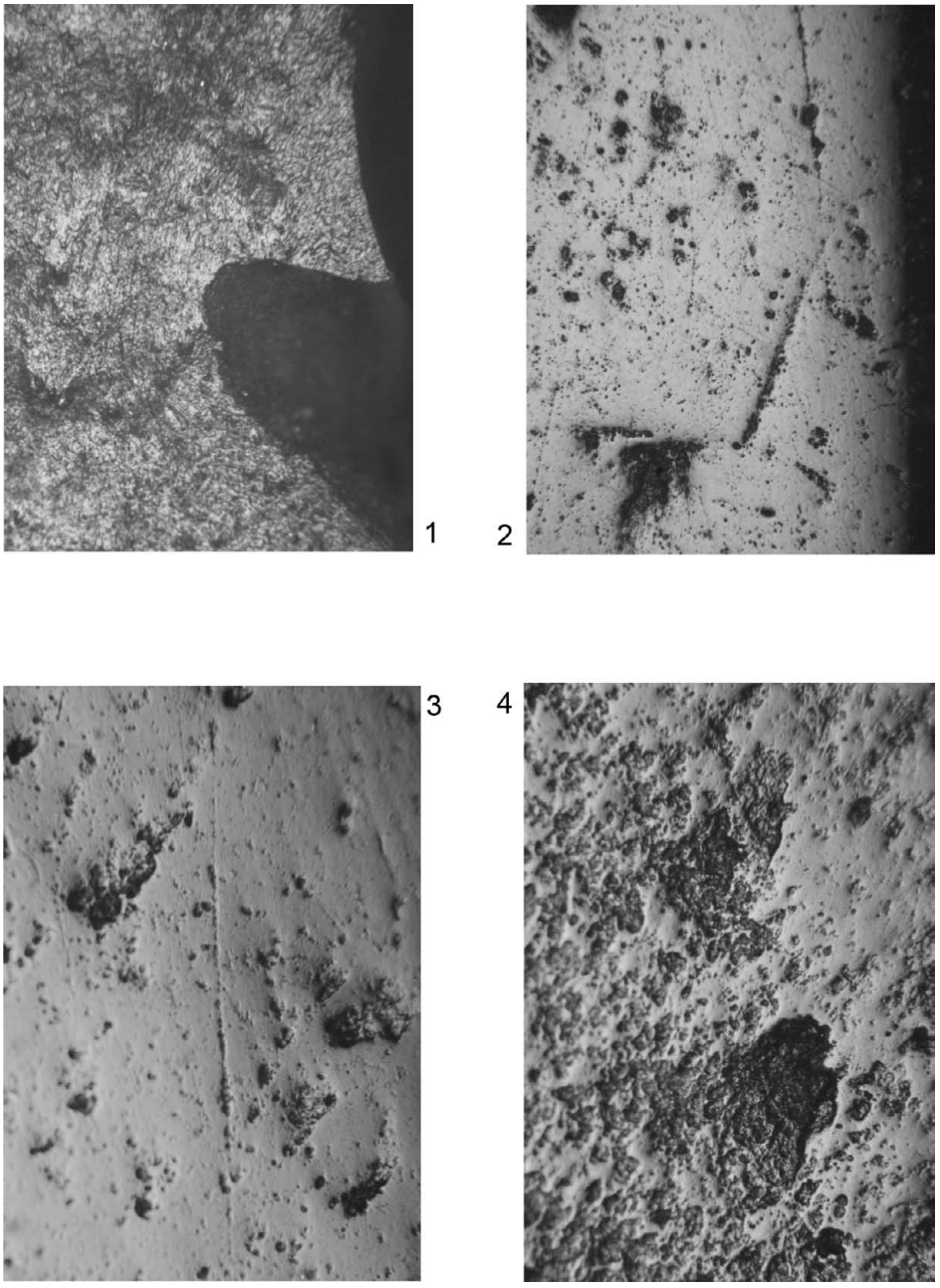


Fig. 122. Photomicrographs (x100) of sections with use-wear traces marked by arrows on the artefact drawings: 1(MLIT) – fig. 113.8; 2 (cereal polish) – fig. 114.2; 3 and 4 (cereal polish) – fig. 118.11

- flakes (n=2), showing traces of use as hammerstones. The working surfaces are their dorsal parts (in one case fully corticated, in the other a natural surface of a quartz flake), with chipping in the form of chaotic, round depressions.

General observations and discussion

Without drawing firm conclusions, some admissible characteristics of the assemblage may be formulated from the observations made during the study.

- The structure of the assemblage suggests a well-organized and operating expedient-type industry, as evidenced by the use of a wide range of local raw materials of medium quality. At

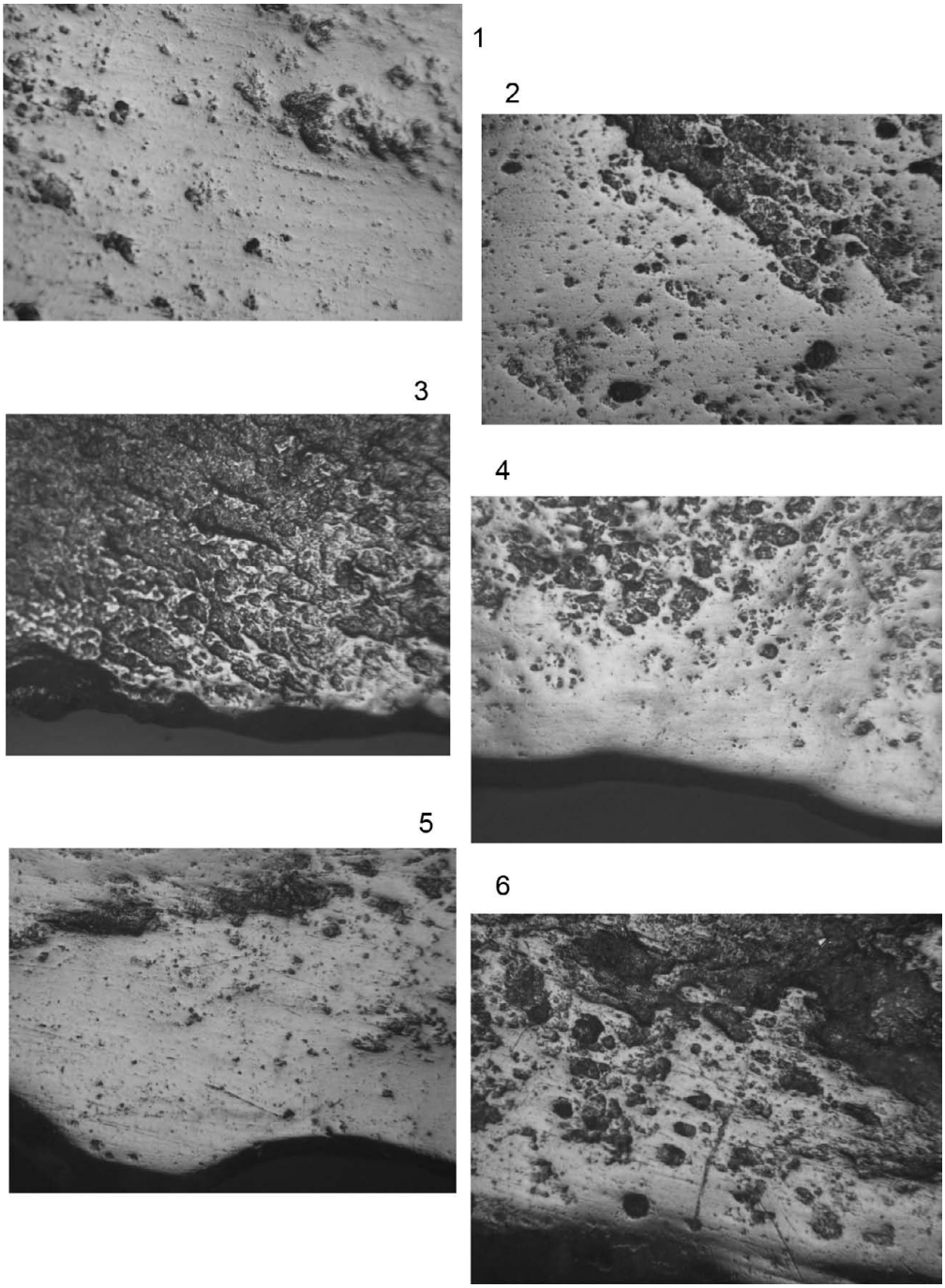


Fig. 123. Photomicrographs (x100) of cereal polish on sections with use-wear traces marked by arrows on the artefact drawings: 1 and 2 – fig. 118.10; 3 and 4 – fig.118.5; 5 – fig. 118.4; 6 – fig. 118.2

least partial knapping (debitage) was carried out *in situ* with testing of different raw materials and techniques.

- At least two forms of *chaîne opératoire* can be reconstructed: i) debitage by direct percussion with a hammerstone, aimed at producing flakes, some of which were shaped into tools (the scarcity of flake cores suggests that they should be sought in other parts of the site); ii) debitage of blades by the punch technique, and iii) a new *chaîne opératoire*, related to microlithization – consisting of bladelet production from small single-platform cores, presumably by pressure (modes 1–3 after Pelegrin 2012; see fig. 145 in Part III). The blades were used directly, as evi-

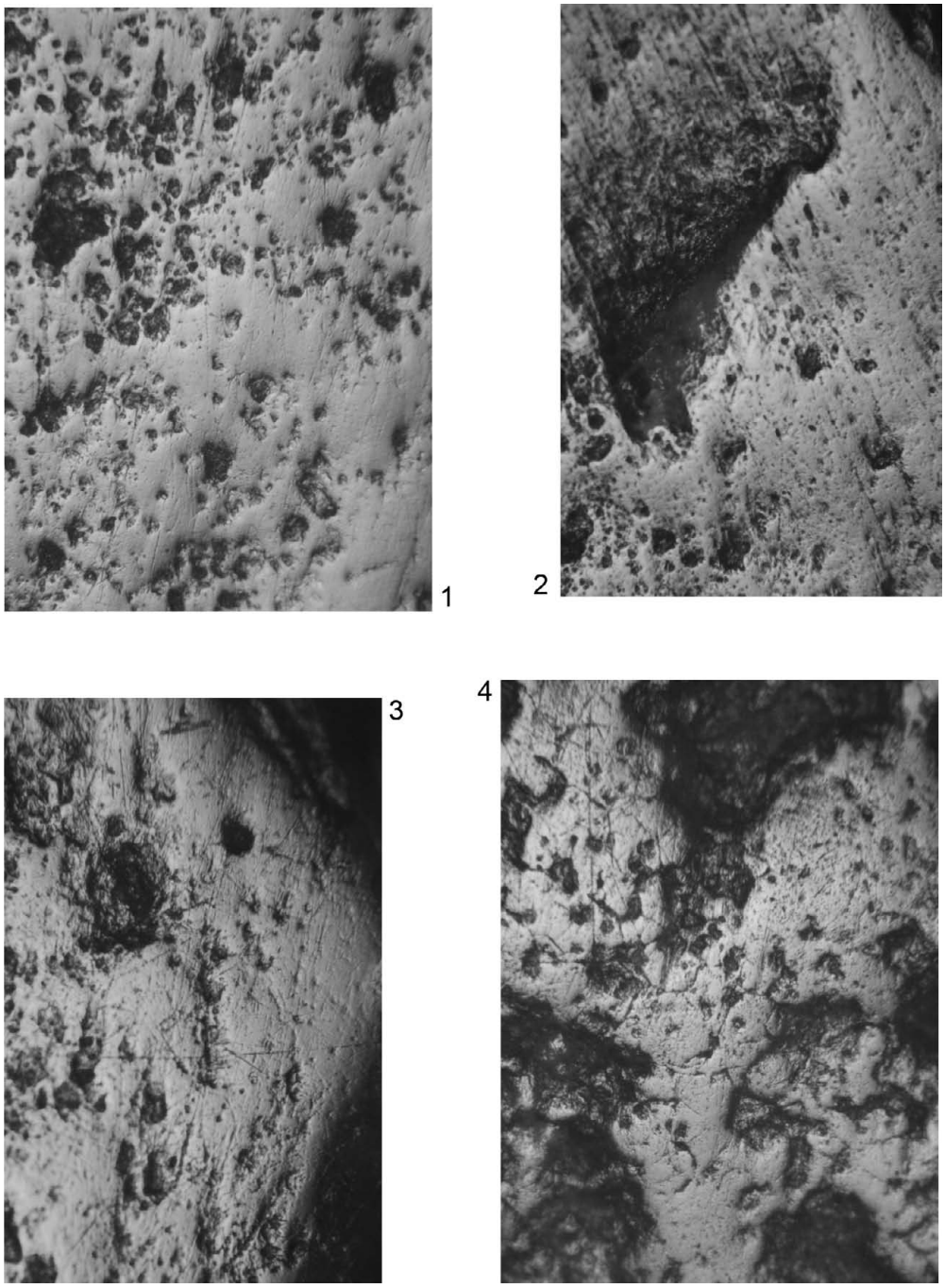


Fig. 124. Photomicrographs (x100) of cereal polish on sections with use-wear traces marked by arrows on the artefact drawings: 1 – fig. 118.1; 2 – fig. 118.3; 3 and 4 – fig. 118.8

denced by the large number of unretouched blades with use-wear traces, or were reshaped into tools, only a few of which were used.

- The typological repertoire exhibits well-defined characteristics of a Late Neolithic assemblage: a prevalence of small endscrapers (including those on flakes), a high percentage of retouched blades, the presence of geometric microliths and individual forms reminiscent of Early Neolithic formal tools (in this case, two perforators on blades with high bilateral retouch and one retouched blade of Karanovo I type). General parallels for the studied collection can be found in flint assemblages from across the country: central-north Bulgaria – the Late Neolithic

assemblages from Samovodene and Kachitsa (Цонев 2007); the Late Neolithic assemblages in western Bulgaria (Gatsov 1993), the Late Neolithic Usoe I culture (Kamchia River Valley) (Скакун 1994), and the assemblages from Thrace – the sites of Karanovo and Drama–Gerena (Karanovo III–IV cultures, especially Karanovo IV) (Gurova 2002a; 2004a; 2019). The flint assemblage shows its closest parallels in the materials from the Neolithic pit sites, such as Sarnevo (Gurova 2017a; here Case study no. 6) and Lyubimets–Dana Bunar 2 (Анастасова 2012; Anastassova 2009).

- The results of the use-wear analysis indicate the range of used tools and provide for the possible reconstruction of the subsistence and household activity of the community. They undoubtedly reveal agricultural practices and operations that were part of the population's overall way of life. These results might be even more convincing if archaeobotanical data were available.

In the Bulgarian specialized literature on flint industries, some novelties (both hypotheses and concepts) are not readily accepted or applied, while others remain marginalized. An example of the former type is the hypothesis regarding the differentiation and more serious interpretation of the two opposing kinds of industry: those directed towards the production and consumption of "formal tools" and the opposite ones, called "expedient or opportunistic", based on the production of simple (informal) tools. This topic has been developed and discussed in the Western literature for decades. However, one of the most successful applications is associated with Andrefski (cf. Andrefski 1994). French prehistorians, intensely focused on the concept of *chaîne opératoire* and its possible trajectories in both practical and theoretical contexts, dedicate scientific forums to clarifying the nomenclature for the two aforementioned types of chipped stone (flint) industries (for example, Astruc 2005).

Assemblages like the one from Harmanli, originating from sites along the river terraces of the Maritsa and its tributaries are potentially very interesting for interpretation in terms of: the definition of the expedient industries that supply raw materials from the Rhodopes' volcanic rocks in the context of embedded/incidental procurement of flint nodules alongside other (subsistence) activities and their differentiation from industries based on imported raw materials, with a reduced and reproduced typological repertoire and intensive use of "formal tools" of Balkan flint which persist as reminiscent forms from the Early Neolithic background.

In light of the reliable and well-established dataset and knowledge of Balkan flint provenancing, supply strategy and distribution, the provisioning of this raw material can be assumed to follow the network distributions in which Tell Karanovo and Yabalkovo were involved – either a direct procurement strategy from the outcrops in northern Bulgaria or supplying Balkan flint via the mediating role of sites such as Dzhulyunitsa (or Karanovo?) (see more in the Discussion section).

2.2. CASE STUDY NO. 7: FLINT ASSEMBLAGE FROM SARNEVO

Introduction

Sarnevo is the first (and still the only) site of the "pit-field" type to be fully published in the series of rescue excavations in the context of NAIM–BAS infrastructure projects (Bacvarov et al. 2017). These peculiar sites were introduced into the Bulgarian prehistory agenda as agglomerations of pit features, interpreted as being related to the ritual rather than domestic sphere (Николов 2011; Бъчваров 2017; Петрова и др. 2024). The chrono-cultural affiliation of the site is specific – Late Neolithic (Karanovo III–IV periods in Thrace) – established through material culture (mainly pottery) correlations and confirmed by ^{14}C dates, suggesting a time span of 5355/5320–5335/5290 cal BC (Cook et al. 2017, 509).

The relatively large flint assemblage (n=1091) was published by the author in Bulgarian, with an English summary (Gurova 2017a). The assemblage is fascinating and instructive in revealing the coexistence of heterogeneous (in their diagnostic attributions) characteristics and is presented here in a more general aspect. The assemblage comes mainly from negative features (pits); from layer 2, treated as stratigraphically reliable and containing materials identical to those from the pits; and from layer 1, with compromised stratigraphy combining finds from the surface, ploughing and redeposited levels. According to the explorers, "Layer 1 is formed from the soil accumulated throughout the millennia after the Late Neolithic and from the remains of human activities in the Early and Late Iron Age and the Late Roman period. Layer 2 is formed from the Neolithic palaeosol and from the remains of human activities related to the Late Neolithic pit deposition" (Bacvarov, Tonkova 2017, 18). This assumption made the results of the flint assemblages from different contexts particularly challenging and interesting in a comparative perspective. As the results below show, there is no significant difference in the flint assemblage composition between the two layers, which supports the compromised character of layer 1.

The assemblage is presented according to this general contextual distinction, and visualized in Table 25.

Table 25

Artefact category	Structures	Layer 2	Layer 1	Total
Typological tools	92	60	76	**228**
Blades	115	58	59	**232**
Flakes	139	93	80	**312**
Fragments	82	63	87	**232**
Cores	28	9	8	**45**
Varia	19	13	10	**42**
Total	**475**	**296**	**320**	**1091**

Table 25. General structure of the assemblage by techno-typological categories and context

It is striking how high the proportion of the typological tools is within the whole assemblage – 20.8%. The number of tools is comparable to that of blades and fragments. The proportion of the cores is also very high – 4.12%. As usual, the debitage products are most numerous and rep-

resent 71.1% of the total artefacts. It is not relevant to compare the assemblage with any other case studies because of its peculiar profile – ritual "pit-field". However, the flint assemblage deserves closer attention as the tool repertoire, Balkan flint presence and functional connotations together open interesting interpretative trajectories.

The assemblage was subjected to techno-typological and functional analysis. Use-wear analysis was undertaken using a stereomicroscope MBS 10 (x100), metallographic microscope METAM P 1(x200) and digital microscope Keyence VHX-100[1] (with a magnification range from x25 to x150). The latter was used for the photomicrographs. All typological tools, most blades and selected flakes and fragments with suitable morphometric parameters and potentially working edges were subjected to microscopic observations and documentation. The data on microscopically observed artefacts and the results of the functional analysis are presented in the tables below and briefly commented on. The functional determination combines macro- and microtraces of utilization with emphasis on the latter, because the macrochipping could be due to various taphonomic factors.

In the beginning, some general reasoning on the distinct techno-typological categories/groups will be provided to facilitate the description. Part of the debitage products – flakes and fragments – are presented in a more generalized way (in comparison with the debitage from the site of Harmanly, for example – see Case study no. 7). Because of the small number of small flakes (< 1.5 cm) and chips, in the general statistics they are attached to the groups of flakes and fragments, respectively. The fragments traditionally contain flake fragments and undetermined pieces (debris/waste and chips).

As for the typological repertoire, it is interesting for the eclectic symbiosis of tools with recognizable chrono-cultural attributes (i.e. different diagnostic tool types). There are tools with unambiguous origins and belonging primarily to the Karanovo I and II Early Neolithic typological *koiné* – called by the author "formal tools/toolkits" – variously retouched (often with high steep retouch) blades of Balkan flint, including sickle blades and elements (Gurova 2008a; 2012a–b; 2018b; Gurova, Bonsall 2014a; etc.). This category is mentioned below as an abbreviation (ENFT – Early Neolithic formal tools). On the other hand, the prevailing tool category in the assemblage is represented by the endscrapers with shortened proportions (when they are on blades) or fashioned on small flakes (sometimes circular, ovoid or fan-shaped). These endscrapers relate to the trend of microlithization across the industry, as already mentioned in the texts concerning the Late Neolithic. In this exposé, these tools are marked as LNDT (Late Neolithic diagnostic tools). The third, and undoubtedly interesting, tool category comprises the geometric microliths. Among the prehistoric flint assemblages from Thrace, this tool category emerges in the Late Neolithic strata as an aspect of the industry's microlithization, which as such should be subjected (but is still NOT!) to an innovative re-examination and re-reading of the Late Neolithic culture in general as an element of the paleoenvironmental and social transformation starting in the middle of the 5th millennium cal BC. Promising (though so far unachieved) was the multidirectional investigation of the Drama micro-region (see, for example, Lichardus et al. 2000). Some assessment of geometric microliths in Bulgarian prehistory has been presented in several publications by the author (Gurova 2004a; 2010; 2014b; 2017b).

Raw materials: characteristics and procurement strategies

The author's approach to the raw material topic followed the old-fashioned approach to raw

1 Available for use in the Conservation and Restoration Laboratory of NAIM–BAS

material 'study', presented in the Harmanli case study. Based on macropetrographic characteristics, 26 raw material variations were distinguished. They showed some associated grouping (with the cores, for example), but no preferential use of a particular raw material for the production of any specific artefact category was recorded. The artefacts selected as representing different raw materials were not done in consultation with a geologist-petrographer, and the distinction was made based on available publications and the author's personal experience. Among the artefacts, the most frequent are the variants of the atypical Rhodope flints (chalcedony and jasper). These raw materials originated in the regional Oligocene volcanic rocks (rich in jasper and chalcedony veins), primarily distributed in the Rhodope Mountain massif (and particularly in its central and eastern parts) (Кънчев и др. 1981; Начев, Кънчев 1990; Начев 2009).

Regarding the raw material procurement strategy from the Rhodopes, it is plausible and realistic to assume that the populations of settlements near the Maritsa river basin utilized easily accessible, redeposited materials from the Paleogene flint rock formations in the Eastern Rhodopes, which are available in the river's alluvial-diluvial deposits. On the other hand, the widespread occurrence of the atypical Rhodopean flint (particularly from deposits near Haskovo and Chirpan) suggests – and to some extent determines – its broad distribution among the flint assemblages of Thrace (Gurova, Nachev 2008, 34). In fact, within the assemblage from Sarnevo, the bulk of the production (small cores and debitage products) is made of atypical Rhodopean flints, chalcedonies, and to a much lesser extent, jaspers (figs 136–137). There are also elements of 'exotica' even among the locally available raw materials – namely, rock crystal (fig. 138.2) and some particularly beautiful transparent, fibrous chalcedonies.

Among the distinctive raw materials, particular attention is paid to the Balkan flint, easily recognizable, especially after the focus by the author and a small team of geologists and colleagues on this raw material – its provenancing, distribution and use (for more details, see Part I). It is unfortunate that the site's excavators conducted no specific geological analyses, and that site samples (including the Balkan flint) were not included in the samples subjected to multidisciplinary research. The presence of artefacts and formal tools of Balkan flint in the Sarnevo assemblage does not suggest direct import of Balkan flint, but rather reutilization of artefacts functioning and circulating within the Early Neolithic cultural milieu. It is worth recalling that such formal tools appear as reminiscent forms during the Karanovo III–IV and IV periods in the eponymous tell (Gurova 2004a). The grey version of Balkan flint (the same as its appearance in the Karanovo, Dzhulyunitsa and Varbitsa assemblages – according to micropetrographic and trace-element results) and macroscopically identical with the flint type B from Tell Karanovo (after Gatsov, Kurčatov 1997) is the second high-quality raw material recorded in the Sarnevo assemblage. As the latest combined geological investigation shows, there are some similar raw materials among the identified and documented ones. Still, its outcrops are not known for certain but are likely to be found among other Upper Cretaceous flint-bearing limestones in north Bulgaria (Gurova et al. 2022a–b).

Flint artefacts from the structures/pits

Because, contrary to the author, the excavators placed gnoseological emphasis on the pits and their backfills, in the original publication, all pits with flint artefacts recorded in them are presented individually. Here, the flint assemblage from the pits is summarized. For details, the reader can refer to the original publication (Gurova 2017a). My focus here is to show the compositional similarity/diversity between the assemblage from the pits and especially those from layers 2 and 1, which were, in my view, equally significant as accumulations of material/flint

artefacts which subsequently were deposited as components of “ritual packages”.

Flint artefacts were discovered in 81 structures/pits, and the number of artefacts varies as follows:

- over 40 artefacts – 1 structure;
- from 20 to 30 artefacts – 3 structures;
- from 10 to 19 artefacts – 11 structures;
- from 1 to 9 artefacts – 66 structures.

The summarized data on artefact presence in the structures are given in Table 26.

Table 26

Structure no.	Artefacts’ number	Structure no.	Artefacts’ number	Structure no.	Artefacts’ number
1	**2**	34	**18**	68C	**1**
1A	**3**	36	**1**	70	**1**
2	**1**	37	**5**	71	**4**
5	**1**	37A	**1**	72	**19**
8	**3**	38	**1**	72A	**6**
9	**20**	40	**7**	72B	**11**
9A	**6**	41A	**1**	73	**2**
10	**10**	44	**12**	74	**4**
11	**18**	44A	**1**	78	**2**
13B	**1**	45	**5**	80	**1**
13D	**5**	45A	**1**	81	**3**
13E	**1**	48	**4**	83	**7**
13F	**2**	49	**7**	85	**1**
13G	**4**	49A	**1**	86	**4**
13H	**10**	50	**3**	87	**1**
15	**1**	50A	**1**	88	**23**
17	**3**	51	**2**	88A	**1**
21	**1**	51A	**4**	89	**11**
25	**4**	53	**2**	93	**1**
25A	**1**	54	**8**	99	**3**
26	**2**	57	**1**	102	**2**
27	**17**	58	**17**	104	**14**
28	**28**	60	**6**	108	**3**
28A	**5**	62	**16**	108A	**6**
29	**3**	63	**1**	108B	**1**
30	**3**	65	**7**	109	**3**
30A	**2**	66	**45**	340	**5**

Table 26. Flint artefacts in the structures/pits

General observations on the flint assemblage from the structures/pits

The summarized data on the structure of the flint assemblages from pits are presented in Table 25 above. This assemblage is the most numerous, containing 92 tools, 115 blades, 139 flakes, 82 fragments, 28 cores and 10 items defined as varia. A summary and statistical data on the assemblage are presented in Tables 27–29 and could be formulated as follows:

- The typological repertoire is sufficiently rich (10 tool categories) (figs 125.1; 126.5; 127.2, 14; 128.3–4; 129.9–12, 17–18). The dominance of two typological categories – endscrapers and retouched blades – is striking, with a small but unusual (for the Late Neolithic industry) prevalence of retouched blades. It is noteworthy that the endscrapers with typical Late Neolithic characteristics (LNDT) total seven, for example, which is almost the same as the number of Early Neolithic formal tools (ENFT). The geometric microliths (four trapezes) come from different pits. The presence of a notched blade and a burin is interesting because these types are absent from the assemblage in the layers. The entire typological spectrum is presented in Table 27 below;

- The number of cores is impressive (n=28, see Table 25 above). They came from 15 pits, of which pit 11 contained four cores, while pits 62 and 66 each contained three cores. The remaining 12 pits had one or two cores. The cores are mainly of local raw materials, in an advanced to exhausted stage of exploitation, and with very few exceptions do not exceed 3 cm in length (i.e., the length of the last blades removed) (figs 130.1–2, 4, 7–8; 136.1, 4–5, 7; 137.2–4). All cores are single-platform – 13 for bladelets, seven for flakes, and the rest for both flakes and blades/bladelets. Some of them reveal a reduction system characteristic of opportunistic production without systematic core maintenance features. No refitting between the cores and the blanks (blades) was possible;

Table 27

Tool category	Total
Endscrapers	**26**
Early Neolithic formal tools	**6**
Retouched blades	**27**
Truncated blades	**7**
Geometric microliths	**4**
Perforators/borers	**5**
Retouched flakes	**6**
Combined tools	**3**
Notched blades	**2**
Burin	**1**
Tool fragments	**5**
Total	**92**

Table 27. Typological repertoire of the assemblage from the pits

- The large number of debitage products found in pits is not surprising because of the prevalence of the debitage over the rest of the artefact categories (*vide supra*). Due to the comparable

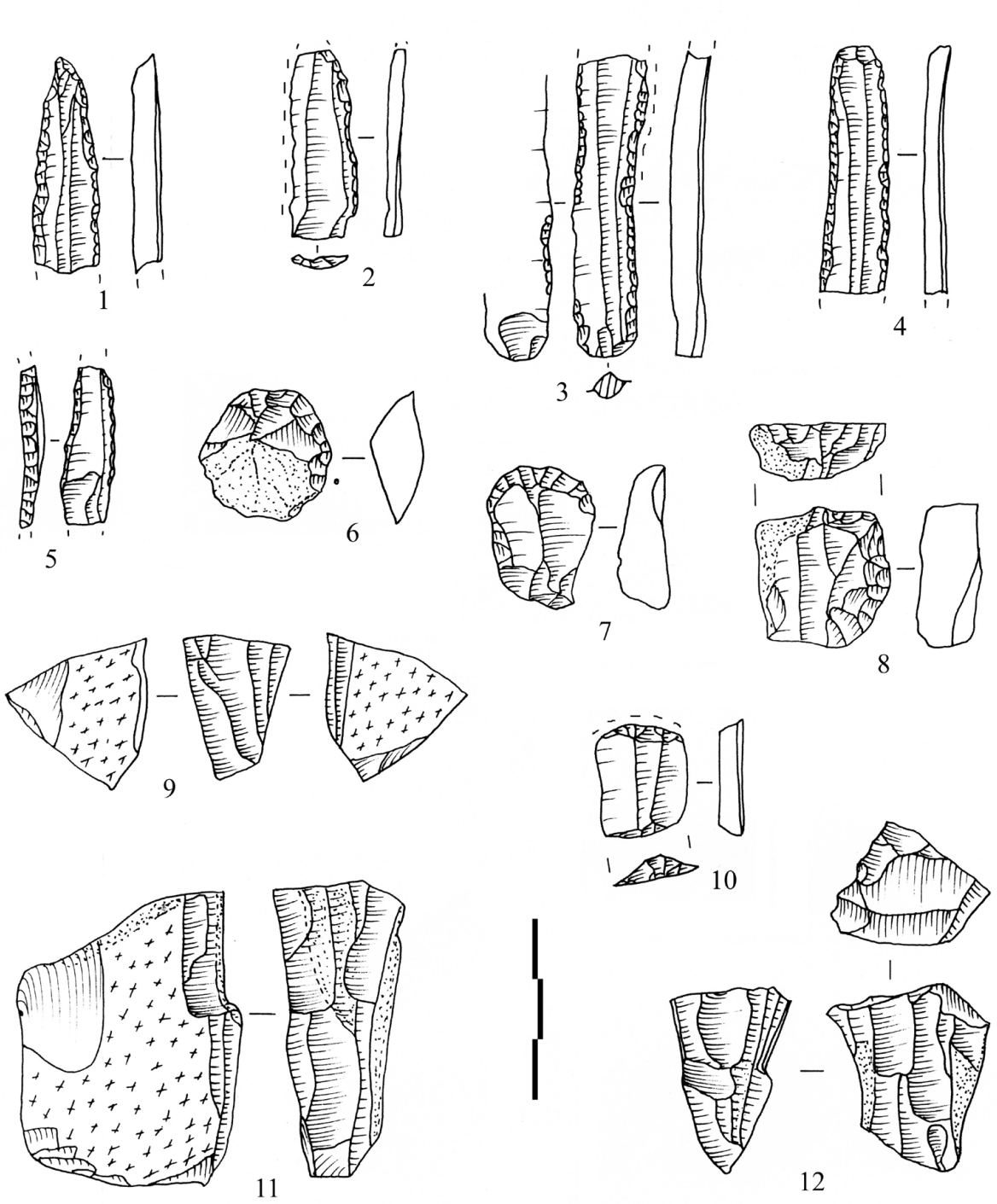


Fig. 125. Tools (1–8, 10) and cores (9, 11–12). From pits: 1, 9, 11; from layer 2: 4, 5–6, 8, 12; from layer 1: 2, 3, 7, 10. Zones of use-wear traces are marked by a dashed line

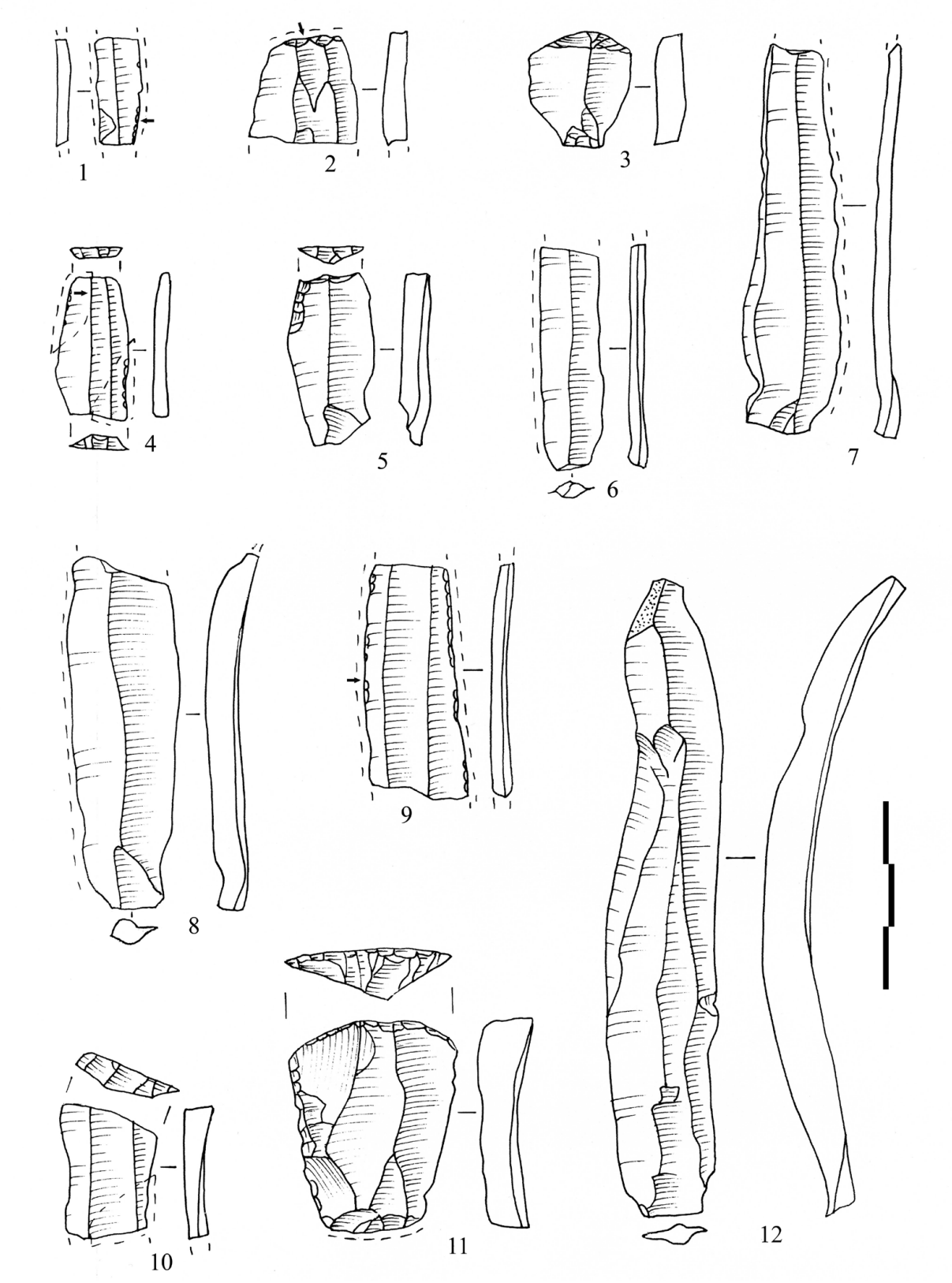


Fig. 126. Unretouched blades (6–8, 12), tools (1–5, 9–11). From pits: 4, 5, 8, 10, and 12; from layer 2: 2, 6, 9, and 11; from layer 1: 1, 3, and 7. Zones of use-wear traces are marked by a dashed line; the arrows show photomicrographs in figs 132–133, 135

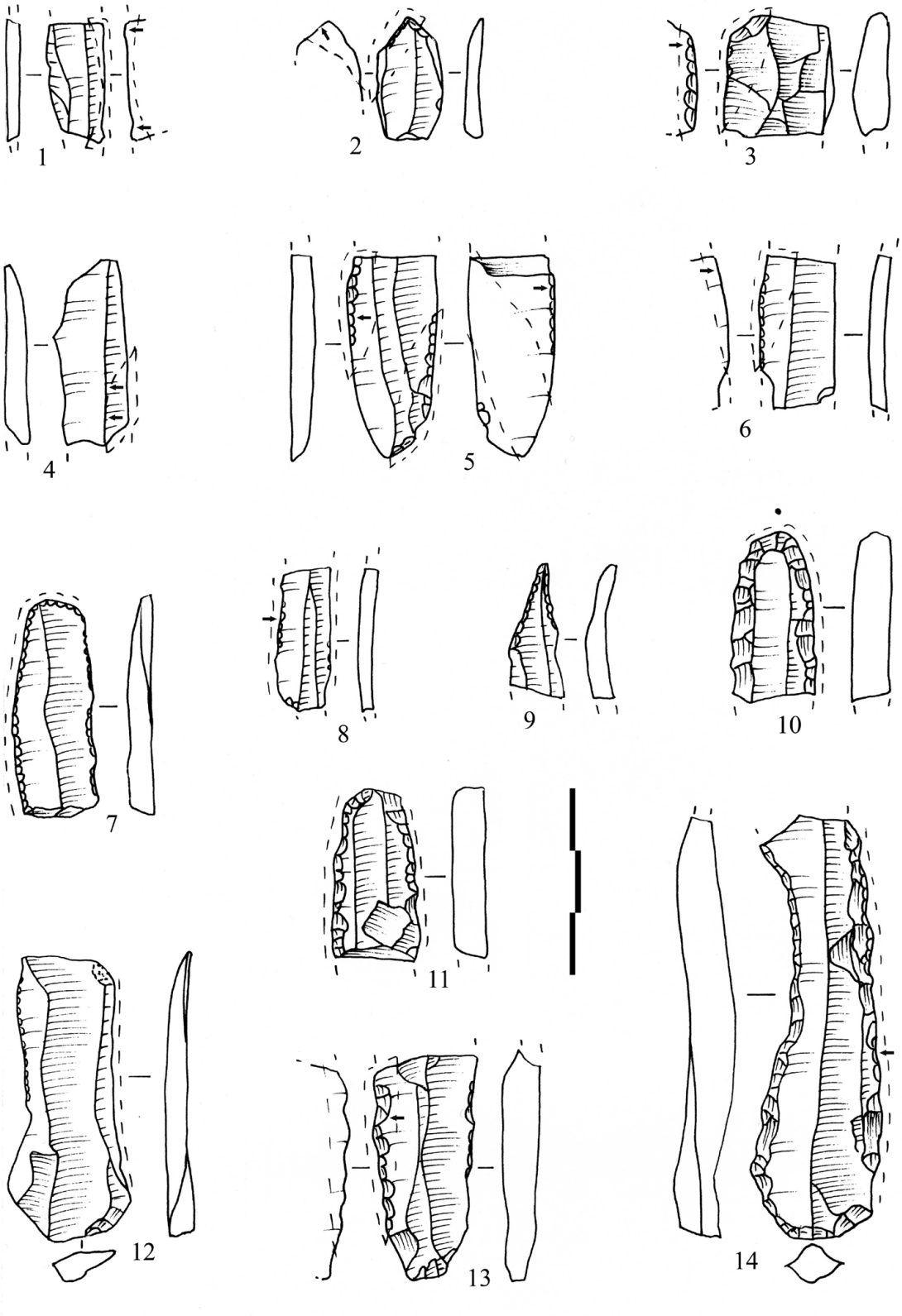


Fig. 127. Unretouched blades (1, 4), tools (2–3, 5–14). From pits: 1–2, 4, 7–9, 12, and 14; from layer 2: 5; from layer 1: 3, 6, 10, 11, and 13. Zones of use-wear traces are marked by a dashed line, the arrows show photomicrographs in figs 132–134

aspect between the debitage products from all contexts, those from the pits will not be presented descriptively – in fact, as all "deposit elements", they were most likely collected from the layers on the sites, which are described below in more detail;

- Use-wear analysis includes all tools (n=92), 80 blades, 40 flakes and 14 fragments. The identified worked material and functions are presented in Table 28. A small percentage of the tools (30%) and a negligible number of blades possess identifiable functions (figs 131.4–5, 7–8; 132.2, 3–4; 133.1–2, 6; 134.1–2; 5–6; 135.3–6). Artefacts involved in the processing of animal products are more numerous than sickle inserts, which are indicators of crop husbandry;

Table 28

Worked material	Tools	Blades	Total
Cereals	7	2	**9**
Other plants/reeds	3		**3**
Wood	1		**1**
Bone/antler	4		**4**
Hide	9	1	**10**
Stone/mineral	4		**4**
Undetermined material	2		**2**
Projectile point/arrowhead	3		**3**
Total	**33**	**3**	**36**

Table 28. Used artefacts by categories according to the worked material

- Among the geometric microliths (presumably frequently associated with a projectile point function), 3 items show traces of use as transverse arrowheads or as elements of composite arrowheads with laterally inserted flint elements (so-called *barbelure* in French). The precise type of arrowhead composition is difficult to define due to the ambiguous character of the scars/fractures on the angles and the lateral edges of the microliths;

- As shown in Table 29, the artefacts of Balkan flints do not refer only to the ENFT groups. Still, they are even better represented across other artefact categories, suggesting that this raw material was known and deliberately supplied via one or more of the developed networks for distribution. Another explanation (more plausible for the author) is that the inhabitants/consumers of the Sarnevo site searched for Balkan flint products in the multilayer tells in the surroundings (as Tells Azmak and Karanovo, for instance) or brought ready produced from preceding Early Neolithic settlements nearby (as the remains of site no. 4, recorded during the field survey in the area).

Table 29

Artefact category	ENFT*	Tools (other)	Blades	Flakes	Cores	Total
Artefact number	6	11	16	6	6	**45**

*Table 29. Artefacts of Balkan flint; * Early Neolithic formal tools*

Flint assemblage from layer 2

The inventory from layer 2 numbers 296 artefacts, including: 60 tools, 58 blades, 93 flakes, 63 fragments, nine cores and 13 varia. The following short descriptions of the material and the Tables with summarized data make the assemblages easily comparable.

The **typological tools'** spectrum is presented in Table 30. The following notes can be formulated:

Table30

Tool category	Total
Endscrapers	**22**
Early Neolithic formal tools	**3**
Retouched blades	**12**
Truncated blades	**6**
Geometric microliths	**5**
Perforators/borers	**1**
Retouched flakes	**5**
Tool fragments	**6**
Total	**60**

Table 30. Typological repertoire of the assemblage from layer 2

- most numerous are the endscrapers (n=22) of which 15 are fashioned on flakes. Seven tools can be defined as LNDT with dimensions from 1 to 2.5 cm (fig. 125.8). There are tools on cortical flakes (fig. 125.6). Very few endscrapers have bigger dimensions, such as the one that is a double endscraper with the distal end close to truncation (fig. 126.11). Five tools have detectable use-wear traces;

- among the retouched blades (n=12), unilaterally-retouched examples prevail (n=7). Marginal discontinuous retouches are the most frequent. In one case, the retouch is steep at the limit to form a backed blade(let) (fig. 125.5). Six blades were used, of which only one served as a sickle insert with bilateral utilization (figs 127.5; 134.3–4). Four blades were used for cutting hide and other undetermined materials, one tool served for bone sawing with the virgin edge, which acquired sporadic utilization micro-scarring (figs 126.9; 132.7);

- among the truncated blades (n=6), three have straight distal truncation, two are fashioned proximally, and one has a double straight truncation. One tool has use-wear traces of hide scraping (figs 126.2; 135.2);

- the geometric microliths are represented by four trapezes and one segment. All trapezes have fine bitruncation on the lateral edges, two are on blades with trapezoidal sections (fig. 129.13–14), and one is on a partially cortical blank (fig. 129.15). The last tool is of transparent chalcedony with crossing negatives on the dorsal surface and noticeable taphonomic smoothing and polishing on the edges and surfaces (figs 129.16; 131.1–2). Only one tool had been used as a transverse arrowhead (figs 129.14; 131.3). The crescent/segment has an arched right edge with fine, steep retouch (fig. 129.5);

- there are five retouched flakes with retouches varying from fine discontinuous to continuous and steep. One of the tools (with convergent lateral edges) possesses traces from scraping wood;

- the tools from the ENFT category number only three: a blade with bilateral retouch (fig. 125.4); and a perforator on a bilaterally retouched blade, used for wood drilling (figs 129.19; 135.1). The third tool combines a truncation/perforator. The pointed tip is on the proximal part of the blade. There are no detectable utilization traces, but multiple resharpenings have been done, possibly removing some relict traces of preceding use;

- there is one perforator on the proximal part of the blade, fashioned by ventral retouch and used for soft stone drilling;

- the tool fragments remain undetermined.

As for the **debitage products**, they can be briefly described as follows:

- blades (n=58) containing 25 proximal fragments (fig. 126.6); 23 mesial, five distal and five intact blades. The measurable dimensions are: 1.3 to 4 cm in length; 1 to 1.7 cm in width, and 0.1 to 0.7 cm in thickness. Three of the intact blades are plunging ones with triangular sections. The ratio of trapezoidal to triangular sections is 37:21; the preserved butts are mainly flat, indicating punch technique; some small compact butts and parallel ridges and lateral edges suggest pressure removal. Eight blades have been used for: harvesting (one); plant cutting (three), fig. 126.6), meat/fresh hide cutting (three) and bone scraping (one);

-flakes (n=93) are mainly in the range of 4 cm in length. There are nine exceeding 4 cm and 2 exceeding 8 cm. Significant in number (n=40) are the cortical pieces; all flakes are the result of direct percussion. One item has been used for scraping undetermined material;

-fragments (n=63), of which 28 are flake fragments, and 35 are undetermined; there are two chips.

The **cores** are nine, with lengths from 2 to 5.4 cm and widths of the removal/flaking surface from 1.9 to 2.9 cm. There are eight single-platform cores (two for flakes and six for a blade and bladelets (figs 125.12; 130.3; 136.2). Three of the cores show rejuvenation of the striking platform (figs 130.6; 136.3).

Varia are represented by 13 artefacts: nine flint concretions with sporadic testing negatives; an oval concretion with traces of grinding hard material; one hammerstone; a nodule used as a hammerstone around its perimeter (fig. 136.6), and a fragment of a massive flake with indications of secondary debitage.

General observations on the flint assemblage from layer 2

- In comparison with the assemblage from the pits, the number of cores is three times less, the typological repertoire shows a more significant imbalance between the tool categories with a noticeable prevalence of endscrapers, and a relatively scarce number of retouched blades and ENFT (see Tables 25 and 30).

- Microscopic observations were made on all tools (n=60), 45 blades, 30 flakes and 10 fragments. The observation already made on the pit assemblages about the scarce number of used pieces is valid – artefacts with detectable functions are not numerous. Still, the range of operations/functional connotation is quite large (see Table 31).

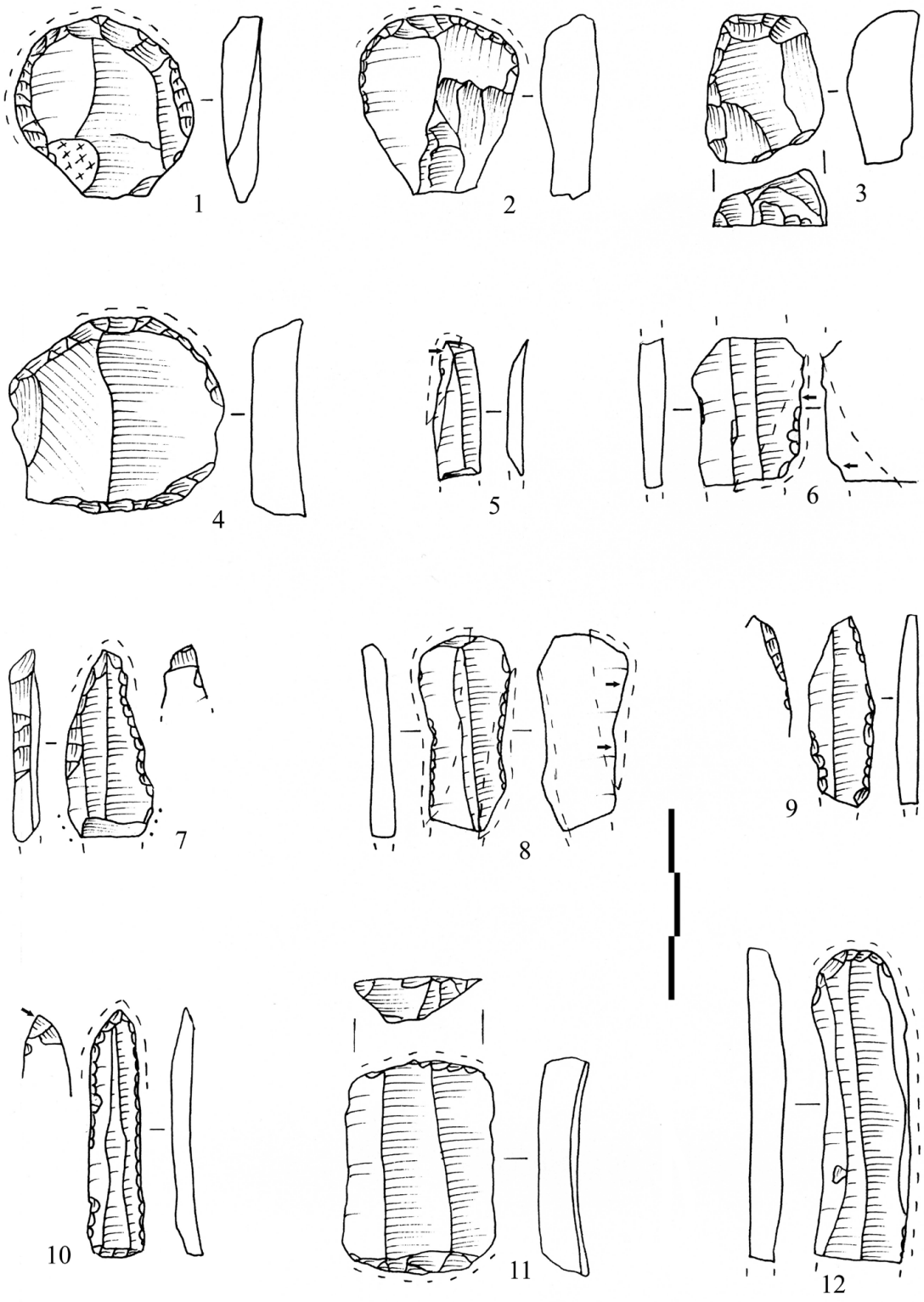


Fig. 128. Unretouched blade (5), tools (1–4, 6–12). From pits: 3–12; from layer 2: 1; from layer 1: 2. Zones of use-wear traces are marked by a dashed line, the arrows show photomicrographs in figs 132–135

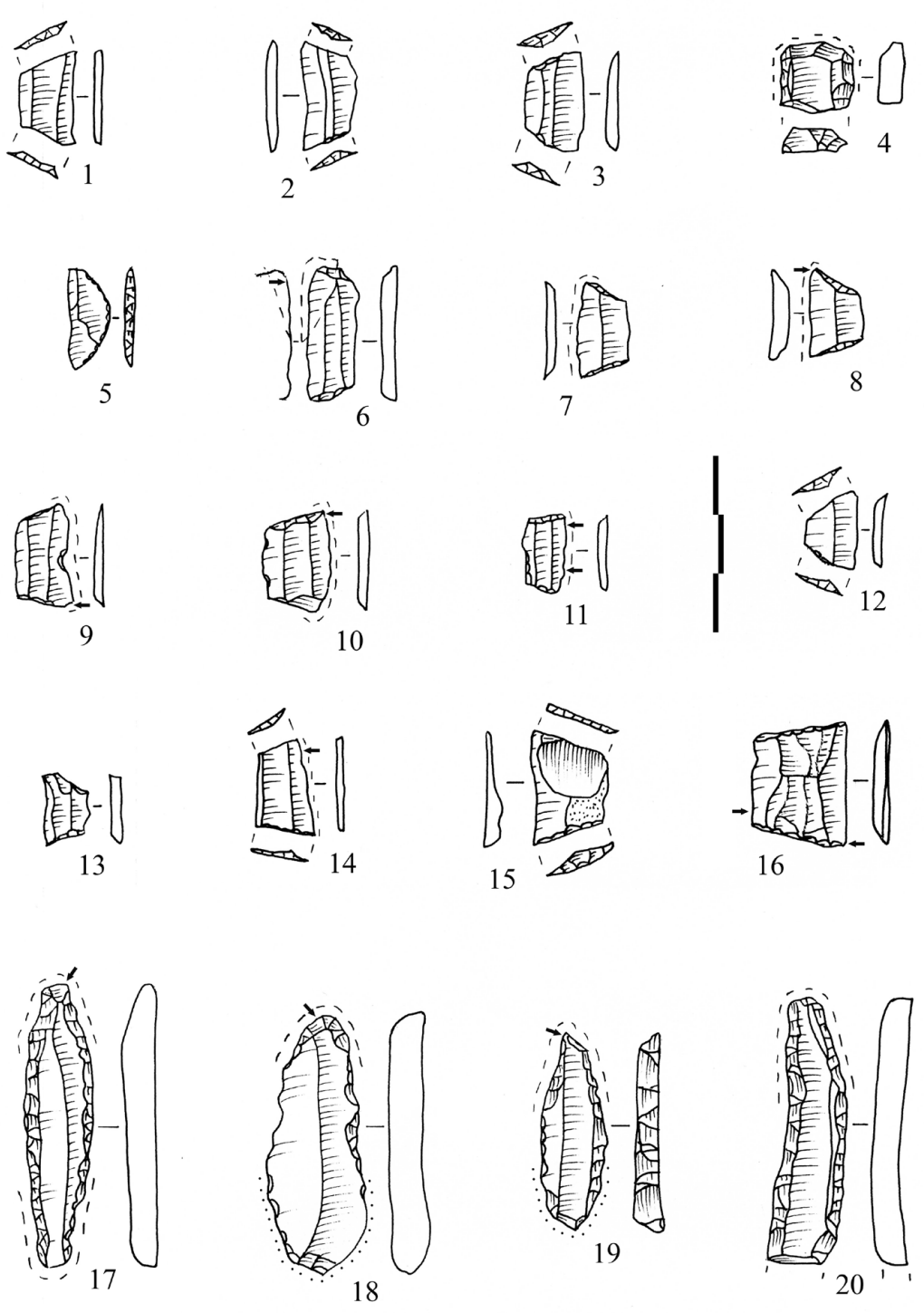


Fig. 129. Tools, 16 of which have a microlith appearance (1–16) and 4 typological perforators (17–20). From pits: 9–12, 17–18; from layer 2: 5, 13–16, and 19; from layer 1: 1–4, 6–8, and 20. Zones of use-wear traces are marked by a dashed line; the arrows show photomicrographs in figs 131–132, 135

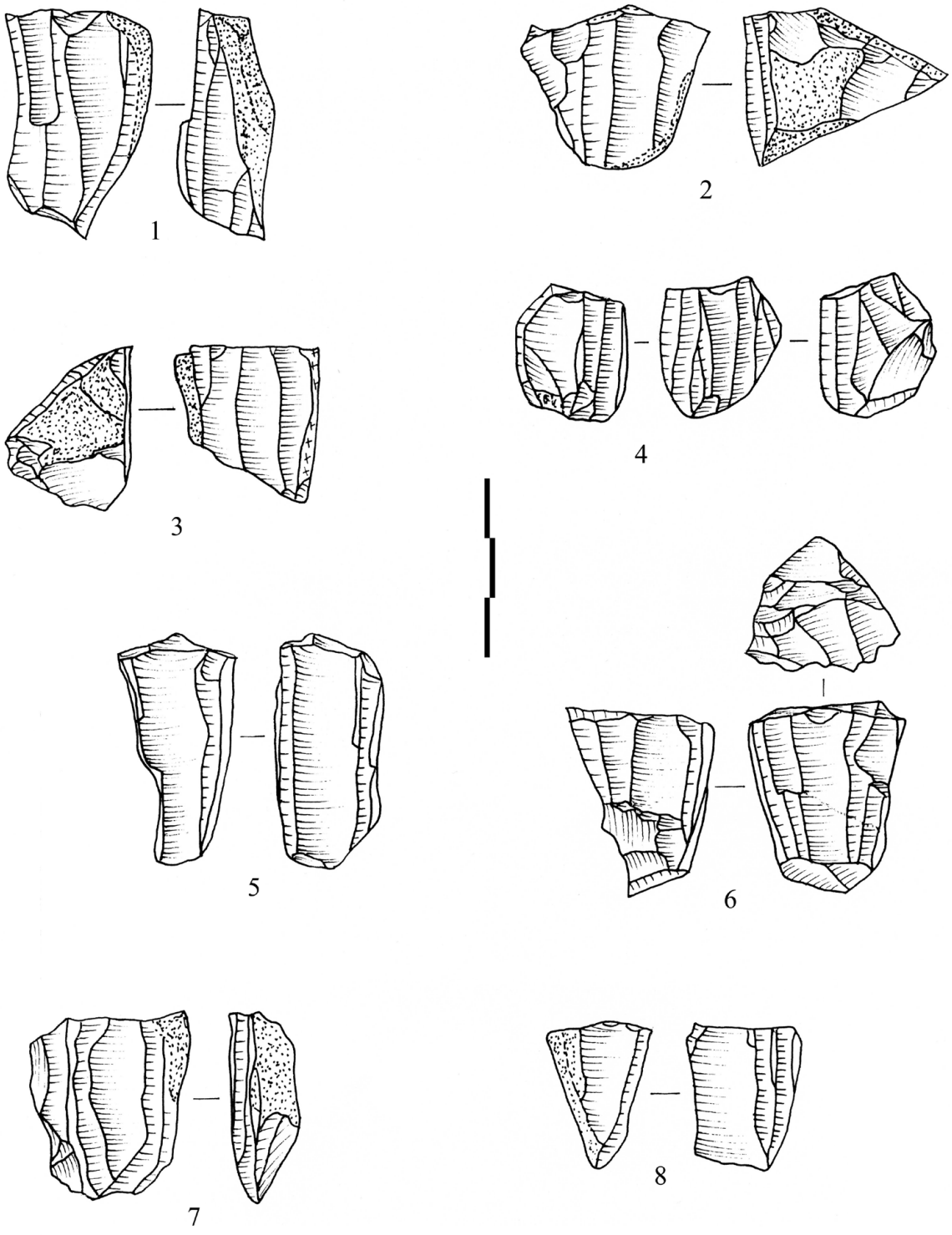


Fig. 130 Single-platform cores for blades and bladelets. From pits: 1–2, 4, 7–8; from layer 2: 3 and 6; from layer 1: 5

Table 31

Worked material	Tools	Blades	Flakes	Total
Cereals	1	1		**2**
Other plants/reeds	2	3		**5**
Wood	2			**2**
Bone/antler	1	1		**2**
Hide	7			**7**
Meat/fresh hide		3		**3**
Stone/mineral	1			**1**
Undetermined material	1		1	**2**
Projectile point/arrowhead	1			**1**
Total	**16**	**8**	**1**	**25**

Table 31. Used artefacts by categories according to the worked material

- Despite its smaller number among the artefacts from layer 2, there are items made of Balkan flint, and the ENFT are about half of the Balkan flint artefacts in total (Table 32).

Table 32

Artefact category	ENFT*	Tools (other)	Blades	Flakes	Fragments	Total
Artefact number	3	6	4	2	1	**16**

*Table 32. Artefacts of Balkan flint; * Early Neolithic formal tools*

Flint assemblage from layer 1

The inventory from layer 1 numbers 320 artefacts, including: 76 tools, 59 blades, 80 flakes, 87 fragments, eight cores, and 10 items of varia. The following short descriptions of the material and the Tables with summarized data make the assemblages easily comparable.

The **typological tools'** spectrum is presented in Table 33 and can be summarized as follows:

- as expected, the most numerous are the endscrapers (n=28), of which 10 are fashioned on blades and 18 on flakes. The dimensions vary between 1.7 and 3.7 cm, and seven tools can be classified as LNDT (figs 125.7; 126.3). Only two tools were used for hide scraping (figs 125.10; 128.2);

- retouched blades (n=16) are half and half with uni- and bilateral retouch, which is fine and marginal, continuous and discontinuous, slightly denticulated and alternate. Six tools have been used: three blades as sickle inserts (figs 127.6; 133.4), one for cutting plants (figs 126.1; 133.3); and two tools served for bone treatment – scraping and cutting;

Table 33

Tool category	Total
Endscrapers	**28**
Early Neolithic formal tools	**10**
Retouched blades	**16**
Truncated blades	**1**
Geometric microliths	**6**
Perforators/borers	**1**
Retouched flakes	**7**
Splintered pieces	**1**
Combined tools	**1**
Tool fragments	**5**
Total	**76**

Table 33. Typological repertoire of the assemblage from layer 1

- the group of ENFT is most representative compared to the other contexts. This group is relatively homogeneous – it contains only blades with bilateral retouch (from semi-abrupt to steep) and with lengths from 2.7 to 4.3 cm. One of the tools has convergent edges, and the distal fracture suggests the tool was a perforator/borer. This presumption corresponds to the relict traces of hard material (stone/mineral) drilling on its edges (fig. 129.20). One of the retouched blades has its proximal part resembling an endscraper front. This tool served for hide scraping with the front and one of the lateral edges (fig. 127.10). Four more tools possess use-wear traces related to: sickle insert (figs 127.13; 133.5); bilateral scraping of hide (fig. 127.11); sawing of bone (fig. 125.3), and cutting of undetermined material (fig. 125.2);

- the geometric microliths are represented by six trapezes, of which one has a more elongated proportion and can be qualified as a double-backed bladelet. This tool served as a sickle insert (figs 129.6; 132.1). A similar function is known from the series of geometric microliths from Drama–Gerena and Tell Karanovo (trench O19, period Karanovo III–V) (Lichardus et al. 2000; Gurova 2002a; 2017b; 2019). Of the other trapezes, two have MLIT complex indicating their use as transverse arrowheads (figs 129.7–8; 131.6), and three are without diagnostic utilization traces (fig. 129.1–3);

- retouched flakes (n=7) with dimensions between 2 and 3 cm. Four of the tools were used as sickle inserts (figs 127.3; 133.8);

- the only truncated blade is on a massive blade of Ludogorie flint, and its presence in a Late Neolithic context is problematic;

- a borer on a blade of Ludogorie flint was used for drilling pottery (clay), and for this piece, the above-mentioned comment about the Late Neolithic context is equally valid;

- there is one splintered piece and an interesting combined tool of endscraper and truncation. This tool has very small dimensions (1.1 x 1.2 x 0.5 cm) and was used for hide scraping with 3 of its retouched edges (fig. 129.4);

- the tool fragments offer little prospect of recognition of their initial type.

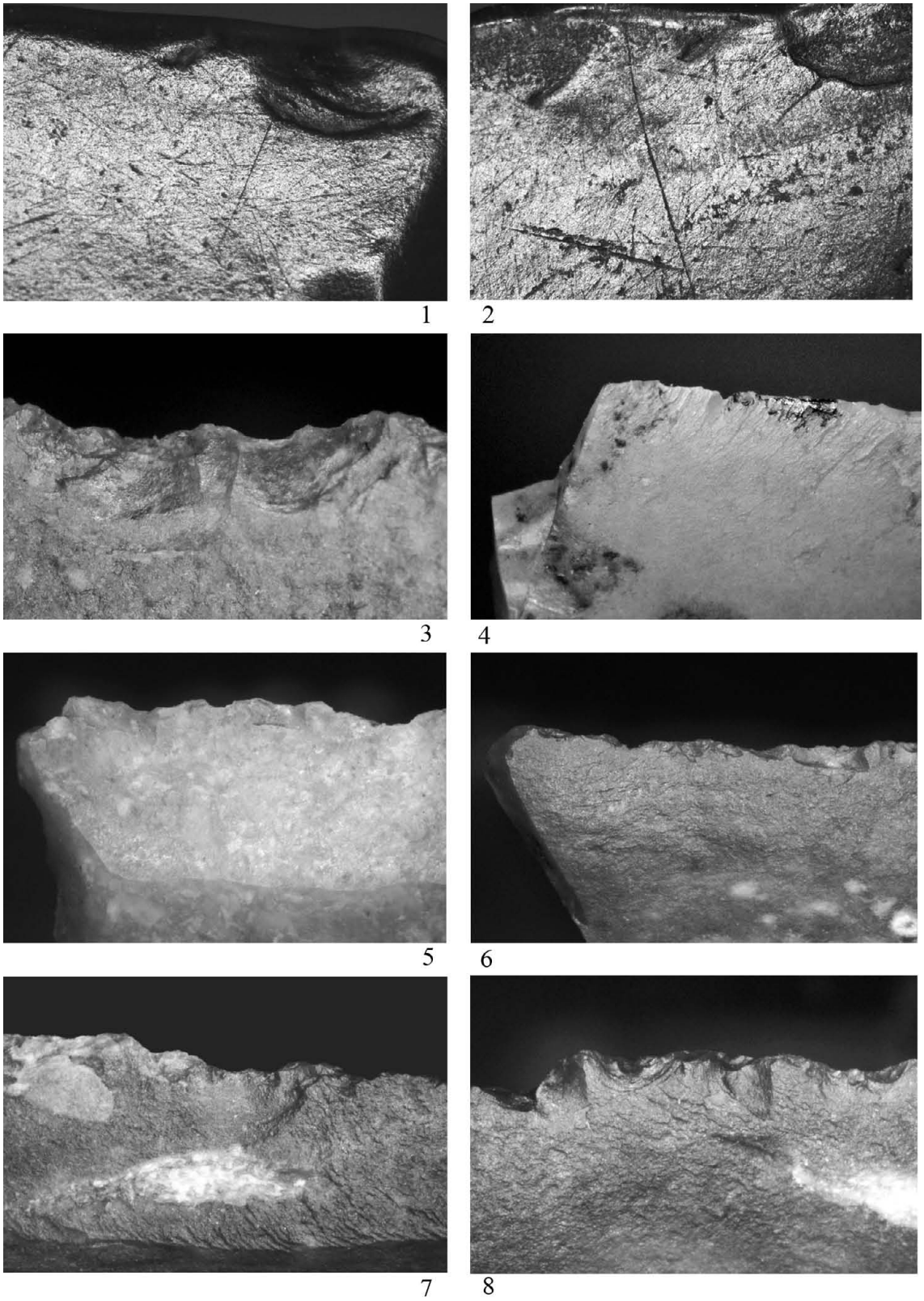


Fig. 131. Photomicrographs of use-wear traces. 1 and 2 (x100): postdepositional surface changes (artefact: fig. 129.16); 3–8: micronotches from use as transverse arrowheads (x50) (artefacts, respectively: 3 – fig. 129.14; 4 – fig. 129.9; 5 – fig. 129.10; 6 – fig. 129.8; 7 and 8 – fig. 129.11)

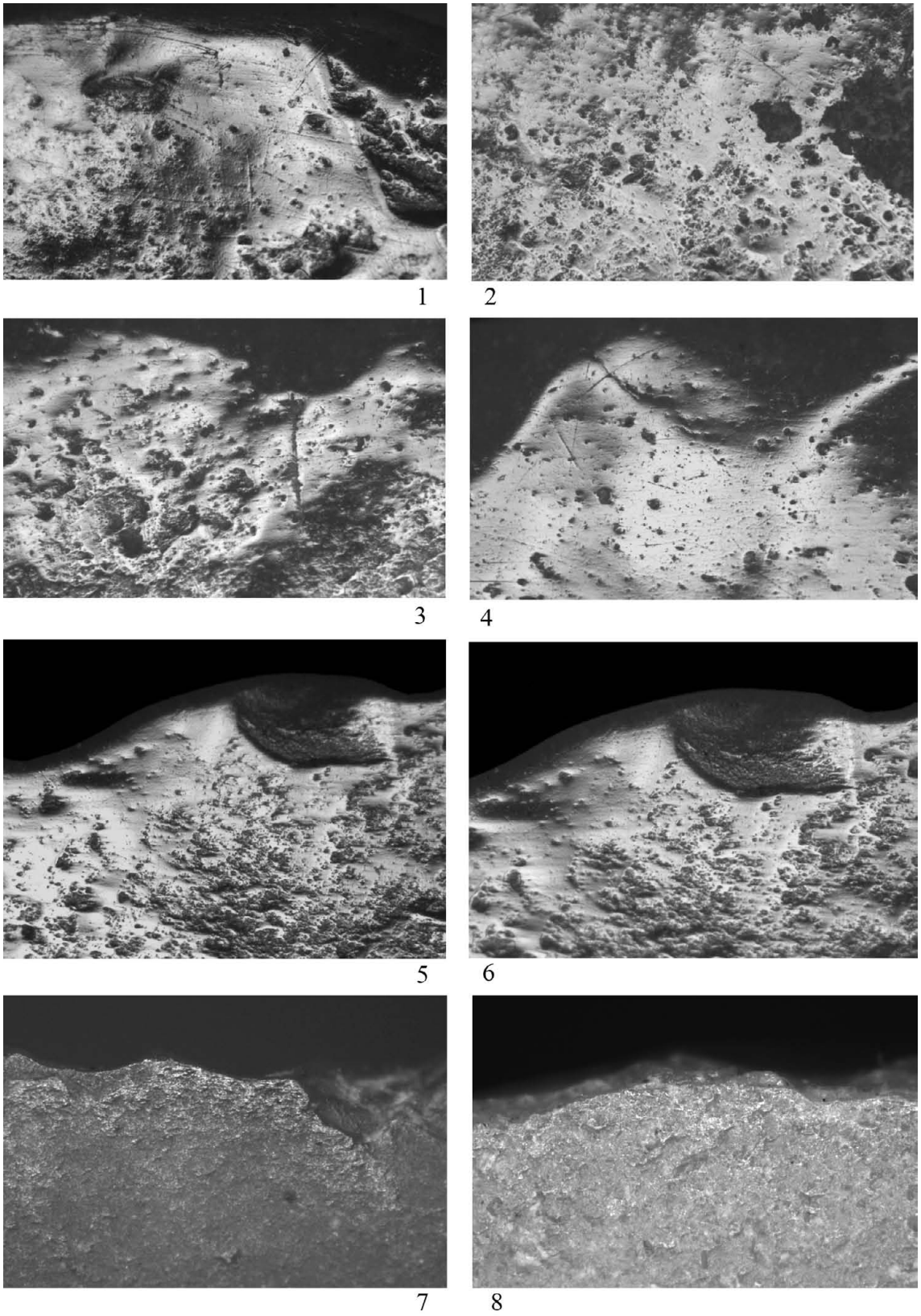


Fig.132. Photomicrographs of use-wear traces. 1–6 (x100): cereal polish of sickle inserts (artefacts, respectively: 1 – fig. 129.6; 2 – fig. 126.4; 3 and 4 – fig. 128.6); 5 and 6 (x150); 7 (x100): bone-cutting (artefact: fig. 126.9); 8 (x100): hide-scraping (artefact: fig. 127.14)

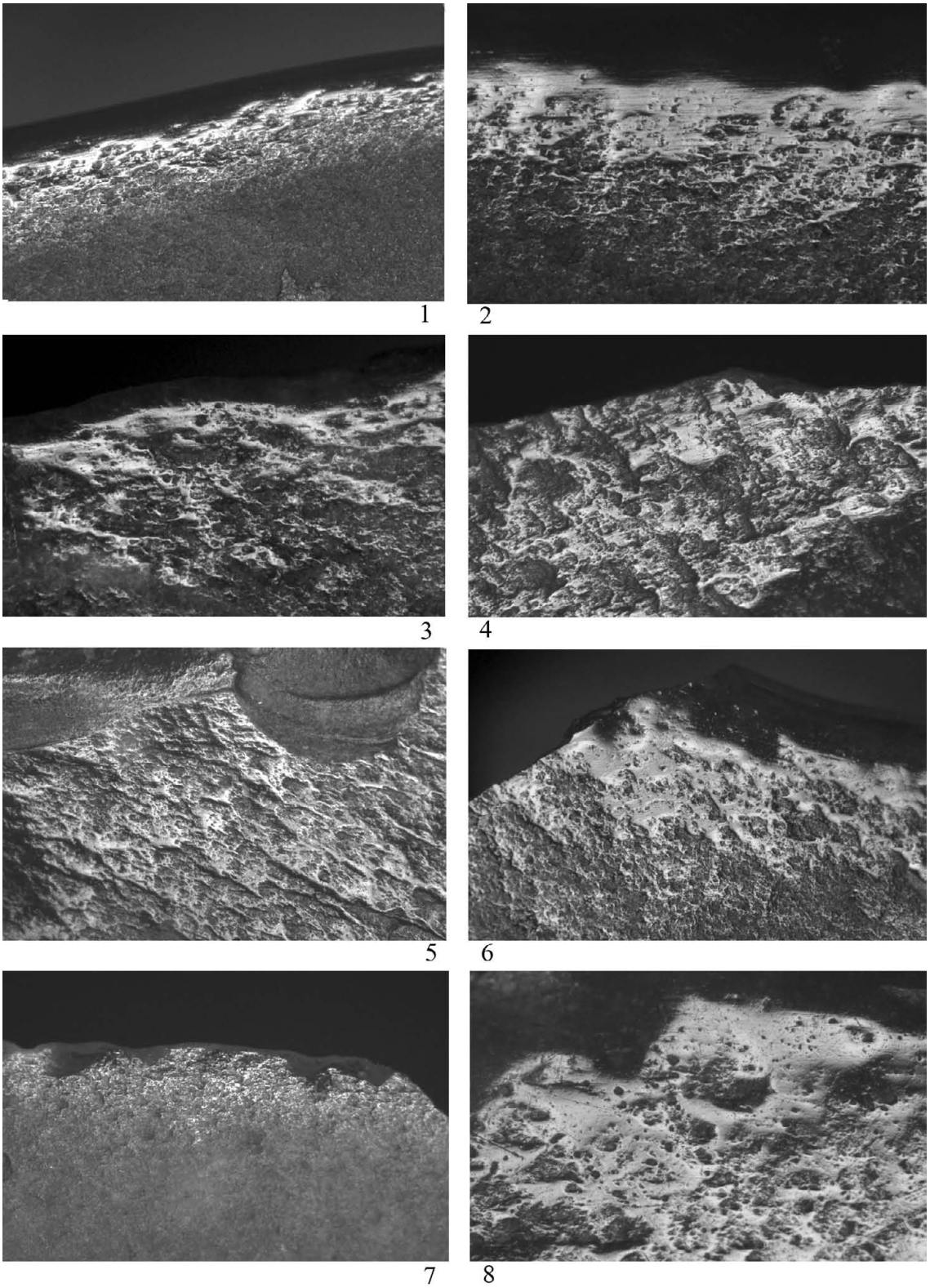


Fig. 133. Photomicrographs of use-wear traces. 1 (x75) and 2 (x100): cutting of reed (artefact: fig. 127.1); 3 (x100): cutting of silica-rich plants (artefact: fig. 126.1); 4–6 and 8 (x100): cereal polish of sickle inserts (artefacts, respectively: 4 – fig. 127.6; 5 – fig. 127.13; 6 – fig. 127.2; 8 – fig. 127.3); 7 (x100): cutting of bone/antler (artefact: fig. 127.8)

As for the **debitage products**, they can be briefly described as follows:

- blades (n=59) are represented only as fragments: 29 proximal fragments (fig. 126.7), 27 mesial and three distal. The measurable dimensions are: 1.6 to 6.8 cm in length; 0.7 to 2.7 cm in width, and 0.2 to 0.5 cm in thickness. The ratio of trapezoidal to triangular sections is 38:21; the preserved butts are mainly single-blow/flat, and several are linear or broken. The most frequent removal technique (according to the available stigmata) is the punch technique. One blade was used for hide cutting (fig. 126.7);

- flakes (n=80) are mainly in the range of 4 cm in length. There are 12 exceeding 4 cm and 6 exceeding 6 cm. The cortical pieces number 40 examples. One item with naturally convergent edges had been used as a sickle insert with one working edge;

- fragments (n=87), of which 19 are flake fragments, and 42 are undetermined, of which 26 are chips. There are 25 cortical fragments.

There are eight **cores**: six single-platform, one double-platform (with bipolar removals), and one multiple (with changed orientation). The single-platform cores include one for blades (figs 130.5; 137.1), two for bladelets, one for flakes and bladelets, and two for flakes. The length of the blade/bladelet negatives varies from 2.8 to 3.3 cm, and the width from 0.3 to 0.9 cm.

Varia are represented by 10 artefacts: six flint concretions with initial testing scarring; a fragment with multiple steep negatives resembling notches; a quartzite fragment (most likely natural), a burin spall and a small fragment with bladelet negatives (microcore fragment ?).

General observations on the flint assemblage from layer 1

- In comparison with the previous assemblages, it is obvious that the assemblages from both layers are suitable for comparison. The number of cores is very close to that of layer 2. The general structure of the typological spectrum is also similar, with a significant difference – the compact group of formal tools (ENFT), which is three times bigger compared to the layer 2' assemblage (see Tables 33 and 30).

- Microscopic observations were made on all tools (n=76), including 40 blades, 30 flakes, and 15 fragments. The above-mentioned observations regarding the limited number of used pieces and the extensive range of operations/functional connotations are valid. However, it is evident that the sickle inserts became the most numerous (see Table 34).

- The number of Balkan flint artefacts is greater than in layer 2, with particular emphasis on the ENFT (Table 35);

- In general, the layer 1 assemblage reflects that of sedentary farmers (such assemblages are common in the Neolithic of Thrace). This may be explained by the fact that layer 1 is closer to the surface and contamination of "inner" settlement finds and features is easily envisageable.

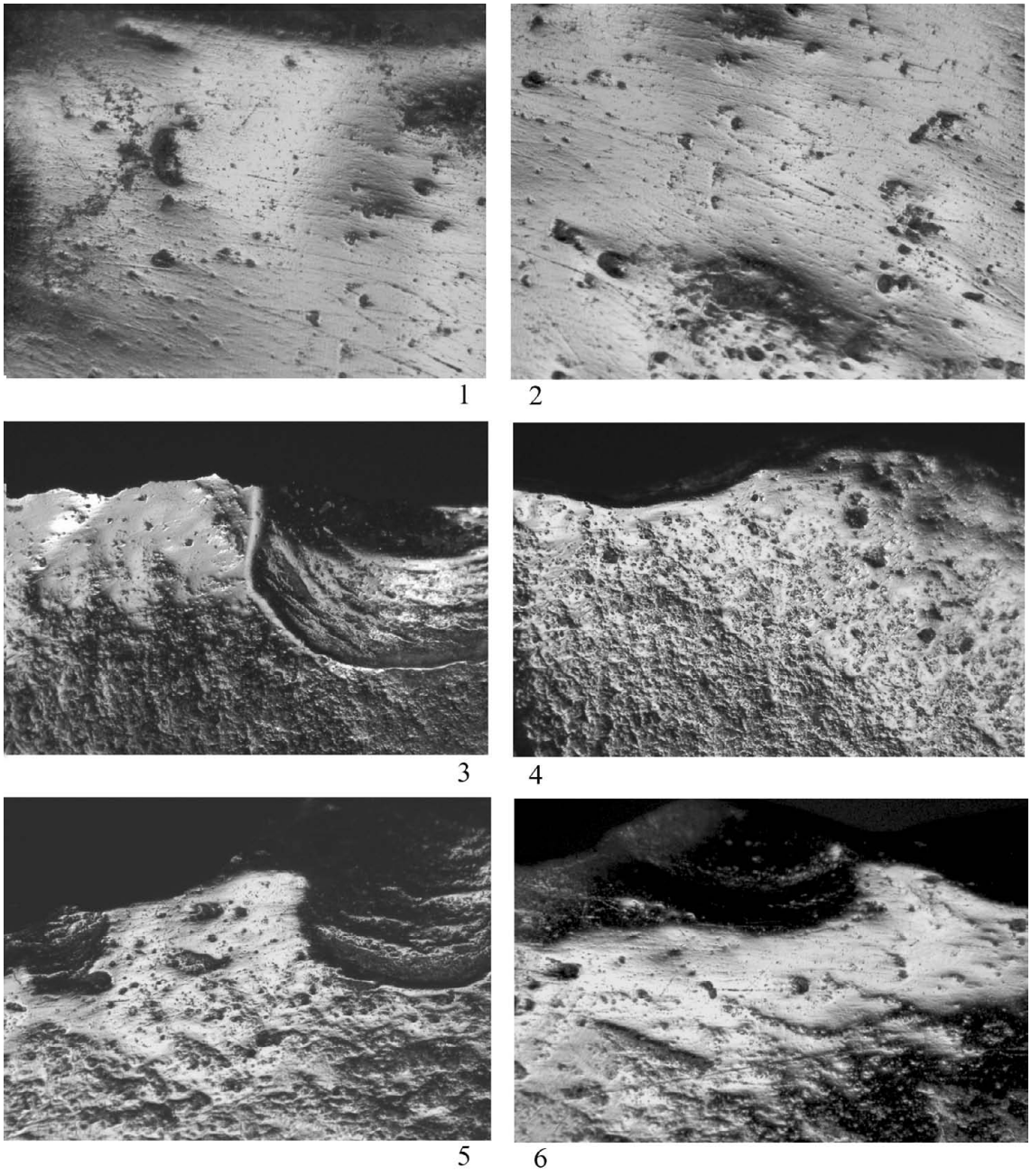


Fig. 134. Photomicrographs of use-wear traces. 1–6 (x100): cereal polish of sickle inserts (artefacts, respectively: 1 and 2 – fig. 127.4; 3 and 4 – fig. 127.5; 5 and 6 – fig. 128.8)

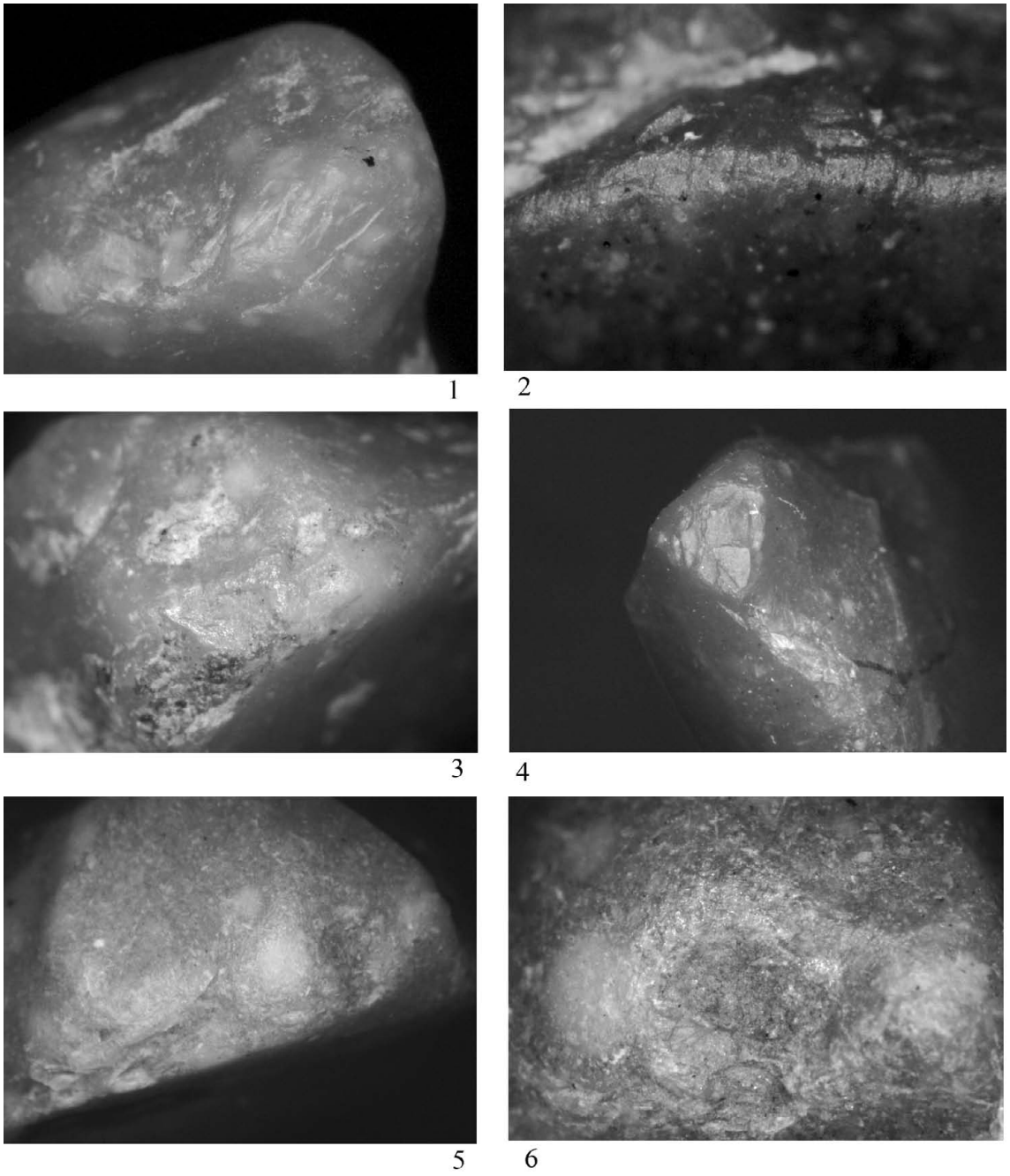


Fig. 135. Photomicrographs of use-wear traces. 1, 3–5 (x 50), 2 and 6 (x100). 1, 3–6: points of tools used as borers for hard materials, e.g., ceramics or minerals (artefacts, respectively: 1 – fig. 129.19; 3 – fig. 129.17; 4 – fig. 128.10; 5 and 6 – fig. 129.18); 2 (x100): hide-scraping (artefact: fig. 126.2)

Table 34

Worked material	Tools	Blades	Flakes	Total
Cereals	9		1	**10**
Other plants/reeds	1			**1**
Bone/antler	3			**3**
Hide	5	1		**6**
Stone/mineral	1			**1**
Pottery clay	1			**1**
Undetermined material	1			**1**
Projectile point/arrowhead	2			**2**
Total	**23**	**1**	**1**	**25**

Table 34. Used artefacts by categories according to the worked material

Table 35

Artefact category	ENFT*	Tools (other)	Blades	Flakes	Total
Artefact number	10	9	8	7	**34**

*Table 35. Artefacts of Balkan flint; * Early Neolithic formal tools*

Final notes and discussion

I have no ambition to make any particular interpretation of the site, different from the excavators' concept (despite my deep scepticism about its 'ritual' character), not least because the fragmentary information we have (in spite of its diverse aspects) and the lack of comparable assemblages would inevitably lead to a speculative interpretation.

Although no serious analytical research on the raw material spectrum of Sarnevo has been conducted, some general observations are apparent: the raw materials are quite diverse (figs 136–138). Among them are 'exotica' such as the Balkan flint (fig. 137.3), grey-black high-quality flint (fig. 137.4), and rock crystal (fig. 138.2). The range of raw materials is similar to those found in most prehistoric archaeological sites in Thrace (including Upper Thrace as in this case) and had presumably been accessible due to the secondary/placer deposits of the Eastern Rhodope volcanic rocks accumulated by the tributaries of large rivers.

The flint assemblages studied and presented above are just a part of a larger, partially investigated complex, and all comparisons between assemblages from different contexts are relative. However, some comparisons of components of the empirical dataset could be instructive. Table 36 presents the artefact categories as percentages of the total number of specimens in the whole assemblage.

To some degree, surprisingly, the general proportion of and the balance between techno-typological categories in three assemblages are quite close and comparable. There are two respects in which the assemblage from the pits differs from the assemblages from the layers: i) the cores from pits are much more numerous; ii) conversely, the used pieces are much less numerous.

Table 36

Artefact category	Structures	Layer 2	Layer 1
Tools	19 %	20 %	23 %
Blades	24 %	19 %	18 %
Flakes	29 %	30%	25 %
Fragments	29 %	21 %	27 %
Used artefacts	7.5 %	8.4 %	7.8 %
Artefacts of Balkan flint	9. 4%	5.4 %	10 %
Cores	5.8 %	3 %	2.5 %

Table 36. Artefact categories in per cent from the whole assemblage

It is interesting to anticipate the principle of selectivity that users of ritual sites employed in choosing which artefacts to include in special, deliberately prepared ritual packages – the basic element in the semantic significance of pit backfills. What an initial reading of the table data suggests is the apparently 'preferential' positions of the cores (which are the most volumetric artefacts, suitable to serve as backfill), and the Balkan flint artefacts (which are the most aesthetically attractive and potentially valuable). It is difficult to imagine an alternative scenario, as flint artefacts are considered marginal within the deposit package. Their role is seen as binary – as exotic raw material and as artefacts made especially for pit deposition (Bacvarov 2017, 235). The former, in the case of Balkan flint and rock crystal, is reasonable, but the latter strikes me as purely speculative.

Table 37

Tool category	Structures	Layer 2	Layer 1	Total
Endscrapers	26	22	28	**76**
Early Neolithic formal tools	6	3	10	**19**
Retouched blades	27	12	16	**55**
Truncated blades	7	6	1	**14**
Geometric microliths	4	5	6	**15**
Perforators/borers	5	1	1	**7**
Retouched flakes	6	5	7	**18**
Combined tools	3		1	**4**
Notched blades	2			**2**
Burin	1			**1**
Splintered pieces			1	**1**
Tool fragments	5	6	5	**16**
Total	**92**	**60**	**76**	**228**

Table 37. Typological categories according to their context



Fig. 136. Chipped stone artefacts: 1–5, and 7: cores for blades and bladelets; 6: hammerstone on a flint nodule from local raw material; from pits: 1, 4–5, and 7; from layer 1: 2–3, and 6

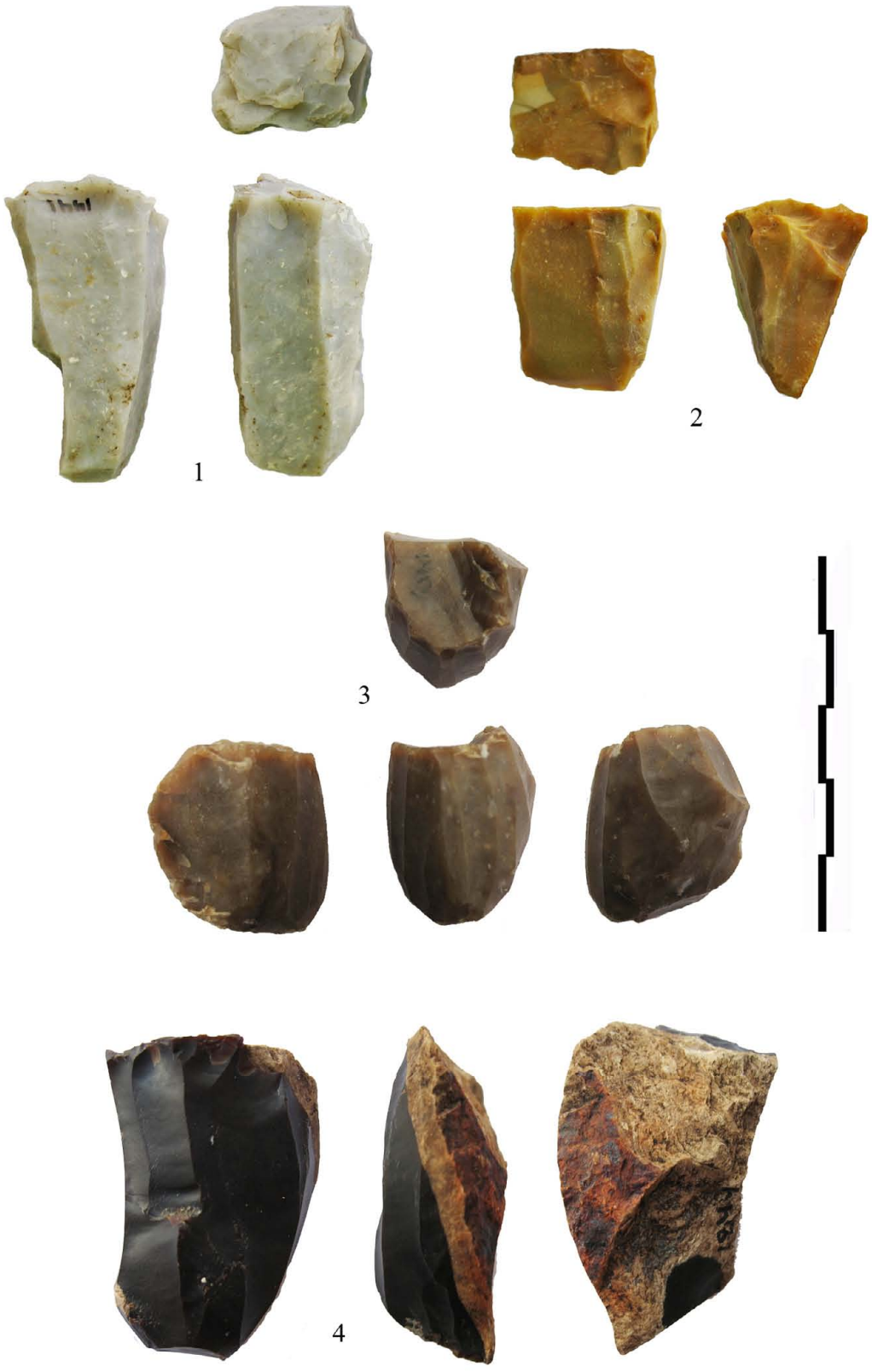


Fig. 137. Cores for blades and bladelets; from pits: 2–4; from layer 1: 1

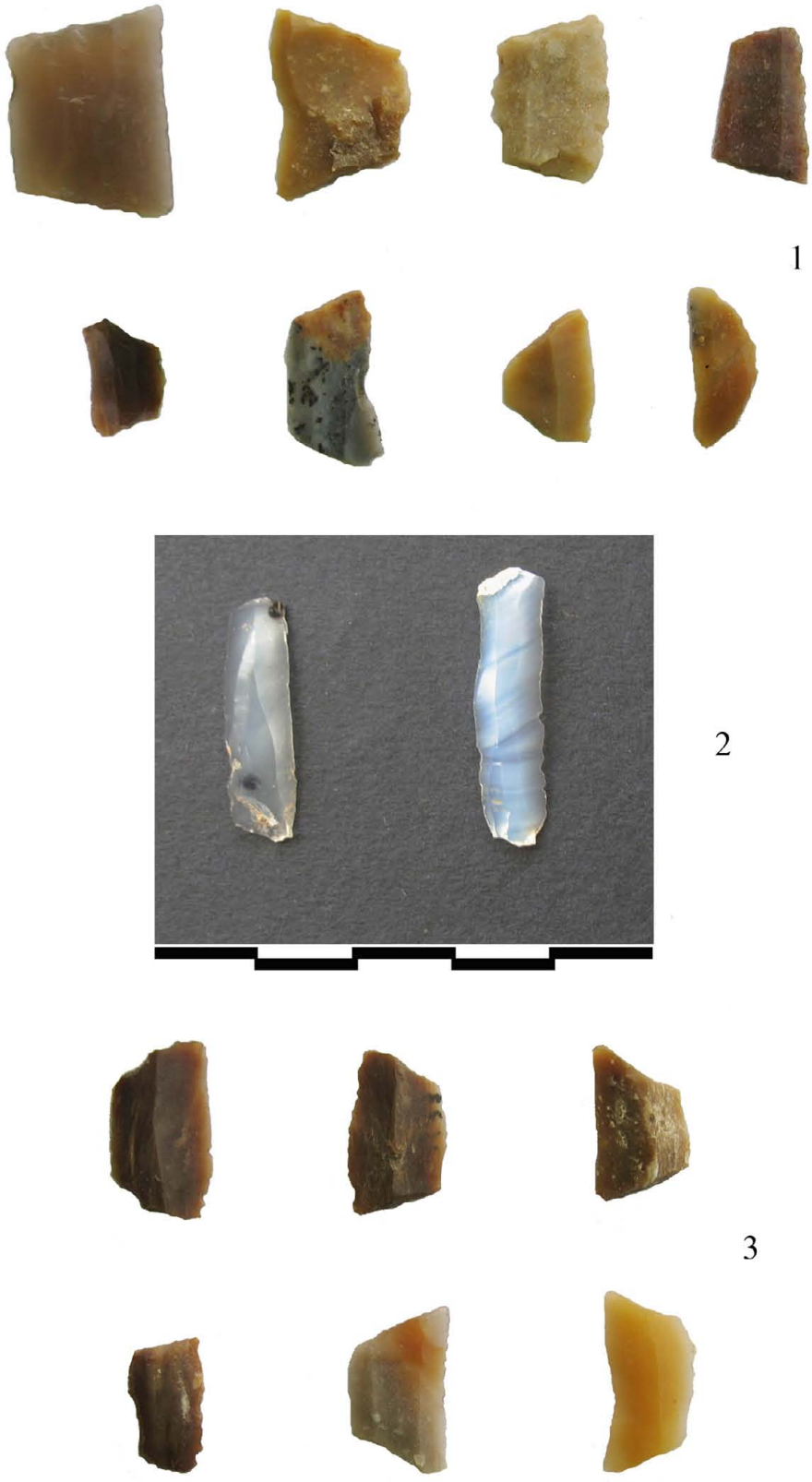


Fig. 138. Chipped stone artefacts: 1 and 3: geometric microliths (trapezes and a segment); 2: chalcedony bladelets (from pits)

Comparison of the typological repertoires of the three assemblages creates the impression of relative homogeneity (Table 37). This is especially relevant for two typological categories that are among the most diagnostic characteristics of the Late Neolithic flint industry: the small endscrapers and the geometric microliths. The latter, it is worth recalling, appear in Thrace in the Late Neolithic (Karanovo III–IV period at the eponymous Tell) and belong to sites (such as Drama–Gerena and Tell Karanovo) but also to other 'ritual' "pit-field" complexes like Lyubimets–Dana bunar 2 (Анастасова 2012; Anastassova 2009). There are some differences, however. The pit assemblage is the only one in which retouched blades predominate, and the only context where notched blades and a burin were recorded. The composition of the pit assemblage does not support the interpretation of a "deliberate placing of specially selected diverse materials in pits in a certain mode, order and connection to each other", as the ritual package is understood and described by the excavator (Bacvarov 2017, 237).

An observation that is not visualized in the text, but should be emphasized, is that the technological parameters of the cores and the debitage products allow me to assume at least three removal techniques: i) direct percussion with hard hammerstones for flake removals mainly; ii) punch technique for most of the blades with flat and large butts; and iii) pressure technique for small blades/bladelets with compact or linear butts and parallel ridges and edges. Which of the three pressure modes, according to Pelegrin's (2012) scheme, was applied is difficult to say.

Intriguing is the presence in two structures (54 and 72A) containing double endscrapers with morphometrical parameters that are consistent with Chalcolithic large blade production (fig. 128.11). Their presence in closed contexts with a Late Neolithic character can only be explained by the presence of later (Chalcolithic) flint artefacts among the material available for deposition in the pits at some stage of the functioning of this peculiar site complex OR if we assume movement of this artefact from the surface by bioturbation (again, with available Chalcolithic artefacts!).

The conceptual and interpretative problems posed by the so-called "pit-field" complexes remain unresolved and await further empirical data (e.g., the discovery of similar sites in other regions) and more convincing arguments to support their 'ritual' character. At "pit-field" sites such as Sarnevo, whether people lived there engaging in routine everyday tasks (the flint assemblage does not exclude this possibility), or visited the site to practise special rituals, filling the pits with materials that constitute a "ritual package", they left traces of their activities there. In terms of the flint industry, the "pit-field" sites contain remnants of everyday household practices: people producing, consuming, and discarding their tools, balancing between formal and *ad hoc* tool manufacture and use.

I conclude with the hope that, in the light of the forthcoming exhaustive publications on Late Neolithic "pit-field" sites, such as Hadzhidimitrovo (Thrace) and Kovachevets (north Bulgaria, Bacvarov et al. in press), and hopefully Lyubimets–Dana bunar 2 and Kapitan Andreevo, the prehistoric research agenda will identify positive and promising conceptual issues.

2.3. CASE STUDY NO. 8: FLINT ASSEMBLAGE FROM BRANKOVTSI

Introduction

The site of Brankovtsi (near the village of Brankovtsi, municipality of Gramada, Vidin district, northwest Bulgaria) was first recorded in the Archaeological Map of Bulgaria system in 2012 by N. Kecheva in the context of the South Stream gas pipeline infrastructure project (Кечева 2013). Two campaigns of archaeological rescue excavations were carried out in 2019 in the framework of the "Balkan Stream" gas pipeline route. The archaeological investigations revealed a single-layer, site, the finds from which indicated a Late Neolithic affiliation, with pottery characteristics of the Vinča and Gradeshnitsa cultures (Kecheva et al. 2020). Chronological attribution has been confirmed by a series of 5 ^{14}C dates on charcoal, from the Poznań Laboratory, indicating a chronological context from 5500 to 5000 cal BC (Kecheva et al. 2023, 272). General information on the site, its structures, and features is presented in the last cited publication (ibid.). The meticulous records of all finds allowed for a detailed spatial distribution within the general plan of the site, where six main features were identified on the geophysical map (Kecheva et al. 2023, fig. 3).

The flint assemblage from the site comprises 311 artefacts, 122 of which have GPS coordinates and relate to some of the features identified. The remainder come from the excavated squares without specific contextual associations.

The general structure of the assemblage, based on techno-typological differentiation and principal features, is presented in Table 38. Structure 3 (not described in the Tables below) is defined as a light construction located to the northwest of the pit in the northern part of the site (Kecheva et al. 2020, 266).

Table 38

Context	Tools	Blades	Flakes	Fragments	Core	Varia	Total
House 1	4	3	6	11			**24**
House 2	1	4	1	5			**11**
House 3	2	4	5	2		1	**14**
Between house 2 and the oven	3	3	2	8			**16**
Oven area	5	1	1	7			**14**
Dug-in /negative feature		1	3	17			**21**
Pit	2		2	2	1		**7**
Structure 3	4		4	7			**15**
From the squares	13	16	14	144		2	**189**
Total	**34**	**32**	**38**	**203**	**1**	**3**	**311**

Table 38. General structure of the assemblage by techno-typological category and context

The assemblage has been analysed, focusing on the following characteristics: i) available raw materials; ii) techno-typological characteristics of the artefacts; and iii) functional connotation, based on use-wear analysis of selected samples. To avoid repetitive descriptions, the assemblage will be presented by its techno-typological groups, without distinguishing between

archaeological features. Observations and conclusions on the spatial/contextual distribution will be provided as comments along with typological descriptions, and in the discussion sections below.

Raw materials: characteristics and procurement strategies

Basic macroscopic observations of the Brankovtsi flint assemblage allowed several types of flints to be recognized, among which are variants of Balkan flint (Gurova 2012a; Gurova et al. 2016) (figs 139–141). The reliable geological identification of flints prompted a survey in northwest Bulgaria, which offered the opportunity to undertake multidisciplinary analyses of new raw materials and an extensive series of archaeological samples. Its goals are recalled in Case study no. 3, above – on the Early Neolithic assemblage from Yarlovitsa (see also Gurova et al. 2021a–b). The Brankovtsi assemblage contributed four artefacts to that study, selected for their macroscopically distinct features (Gurova et al. 2021b, fig. 5.7–10, Table 1, Samples 14–17). The results of micropetrography and trace element (LA-ICP-MS) analysis led to the conclusion that two of the samples from Brankovtsi belong to the First group of flints distinguished, including almost all local raw materials (easily accessible in local outcrops – within 50 km) and sample S17 of the studied assemblage; the second sample S15 resembles the raw material from Replyana, which constitutes a subgroup of the First group (Gurova et al. 2021b, 249, figs 14, 18). Two samples (S14 and S16) belong to the Second group of flints, which consists only of artefacts with various colouristic nuances of creamy-grey and yellowish-brown, with white spots. These flints exhibit petrographic and geochemical similarities with Upper Cretaceous Balkan flint of the Mezdra siliceous-carbonate Formation with outcrops cluster in the Pleven–Nikopol region, and were involved in a supra-regional distribution network with distances between the sources and the sites of ca 150–180 km (Gurova et al. 2021b, 249–250, 255–259; fig. 19). The analyses of flint raw materials from Brankovtsi are of interest from at least two standpoints: i) GIS reconstruction of the supply zones of local raw materials *versus* Balkan flint in northwestern Bulgaria (valid for all site samples that were subjected to multiscalar geological analyses; ii) consideration *vs* eventual reconsideration of the hypothesis of Balkan flint network disintegration during the Late Neolithic. As for the second, although Balkan flint is represented in the Brankovtsi assemblage (among different techno-typological groups of artefacts), it accounts for only 23.5% of the tools. Moreover, the diagnostic formal tools are mainly Early Neolithic in character (which likely originated from some of the Early Neolithic sites in the surroundings), and only two of the endscrapers on flakes, representing diagnostic tools from the Late Neolithic industry, are made of Balkan flint. The comparison between the assemblages from Yarlovitsa (Early Neolithic) and Brankovtsi (Late Neolithic), which are *ca* 30 km apart, clearly favours the hypothesis of the decline in Balkan flint provisioning during the Late Neolithic, even in the area that was intensively involved in an established Balkan flint network recorded from the very beginning of the Neolithic sequence, as has been shown in the case of the Yarlovitsa site (see Case study no. 3).

Techno-typological analysis

The structure of the assemblage presented in Table 38 shows a significant imbalance, with a clear prevalence of fragments (65% of the assemblage) and similar numbers of tools, blades, and flakes. The unique core is not a big surprise, considering the small number of cores in all known Neolithic flint assemblages from Bulgaria. The techno-typological descriptions and

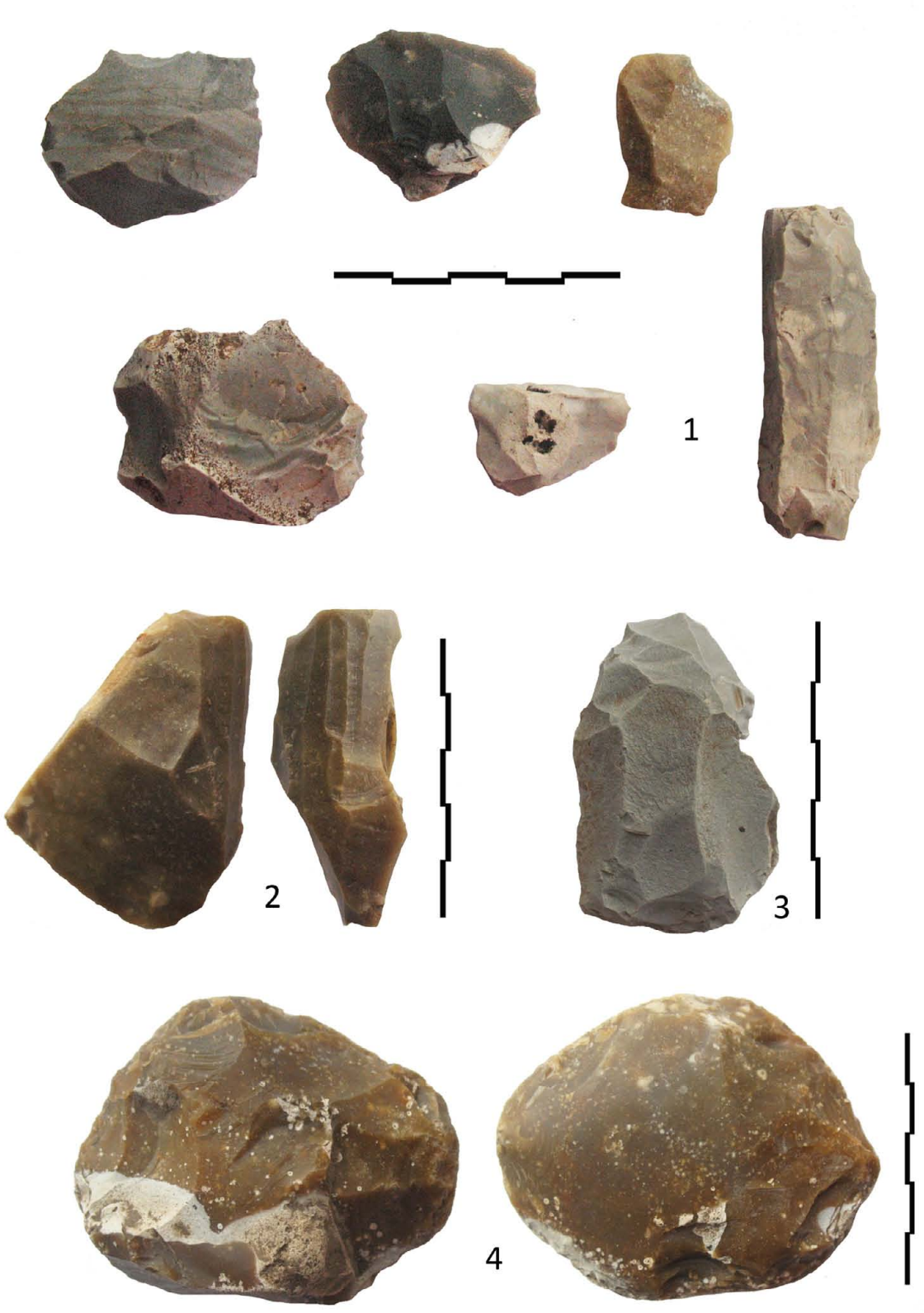


Fig. 139. Flakes of various raw materials (1 – layer, 3 – house1), bladelet core (2 – pit), Balkan flint nodule, used as hammerstone (4 – layer)



Fig. 140. Artefacts of various raw materials (1 – layer), Balkan flint (2 – house 3) and 'grey version' of Balkan flint with uncertain provenance (3 – between house 2 and oven, 4 – oven area)

analysis are based on the following classification:

- typological tools (n=34);
- debitage products (n=274) consisting of:

a) blades (all fragmented) (n=32);

b) flakes (only entire pieces) (n=38);

c) fragments (n=204) – comprising flake fragments (pieces with morphological parameters suggesting fragmented flakes, but without butts or proximal parts) and indeterminate fragments/chunks (in some studies, such pieces are termed debris).

- core (n=1);
- varia (n=3).

As mentioned above, the assemblage will be presented en bloc, with specific comments on the typological repertoire, as shown in Table 39.



Fig. 141. Artefacts of various raw materials (1, 3–4) and Balkan flint (2), all coming from the layer, except the endscraper of BF – last artefact, which is from the pit

Table 39

Context	RB	TrB	ScrF	ScrB	PrBr	Spl	RF	Br	Nch	total
House 1	1		3							**4**
House 2			1							**1**
House 3			1		1					**2**
Between house 2 and the oven	1				1		1			**3**
Oven area	2		2				1			**5**
Pit			2							**2**
Structure 3				1			1	1	1	**4**
From the squares	1	1	7		1	1	2			**13**
Total	**5**	**1**	**16**	**1**	**3**	**1**	**5**	**1**	**1**	**34**

Table 39. Tools categorized by context. Legend: RB – retouched blades; TrB – truncated blade; ScrF – endscraper on flake; ScrB – endscraper of blade; PrBr –perforator/borer; Spl – splintered piece; RF – retouched flakes; Br – burin; Nch – notched tool.

Typological tools

As presented in Table 38 and in more detail in Table 39, most of the tools (n=21) belong to the features identified. Only in the dug-in lower part of the negative feature located in the southernmost part of the site (see fig. 3 in Kecheva et al. 2023) are there no typological tools. Most tools are found in the oven area – in the northern part of the site, east of houses 2 and 3, followed by house 1, where four tools were found. The most diverse typologically are the tools belonging to structure 3 (light construction) – four different types, followed by the tools from the space between house 2 and the oven (Table 39). From this area came a borer of Balkan flint (grey version) that can be attributed with certainty to the category of formal tools of Balkan flint, diagnostic of the Early Neolithic industry (fig. 142.15). Another similar tool (perforator of Balkan flint) came from house 3 (fig. 142.1). Their association with the Late Neolithic context of the site is not intrinsic, but not surprising either, because reminiscent Early Neolithic formal tools are frequent within the Late Neolithic assemblages, as shown in Part I above, and in a previous publication (Gurova 2018b). Among the houses, in house 1, three typical (and diagnostic for the Late Neolithic industry) endscrapers were found (fig. 142.5–6, 8). In house 2, only one tool was found, but it is a very peculiar, high, semicircular endscraper resembling a small flake-and-bladelet core (fig. 142.11). Eight of 34 tools are made of Balkan flint: two pointed tools (perforator and borer); two flake endscrapers; two retouched blades, one truncated blade, and the burin. Five of them show signs of use. The borer is from what we have called the '(dark-) grey version' of Balkan flint, the outcrops of which have not been identified with certainty (see Gurova et al. 2022a–b).

The typological spectrum is dominated by endscrapers on flakes (16 of 34 tools or 47%) (figs 142.5–6, 8–12; 143.2, 4, 6, 10–11). These tools (with one exception – fig. 143. 6) are fashioned on small flakes with various shapes (including semicircular fan-shaped). They are considered a diagnostic feature of the Late Neolithic chipped-stone industries, as part of the microlithization that took place in the second half of the 6th millennium cal BC in the Bulgarian prehistoric se-

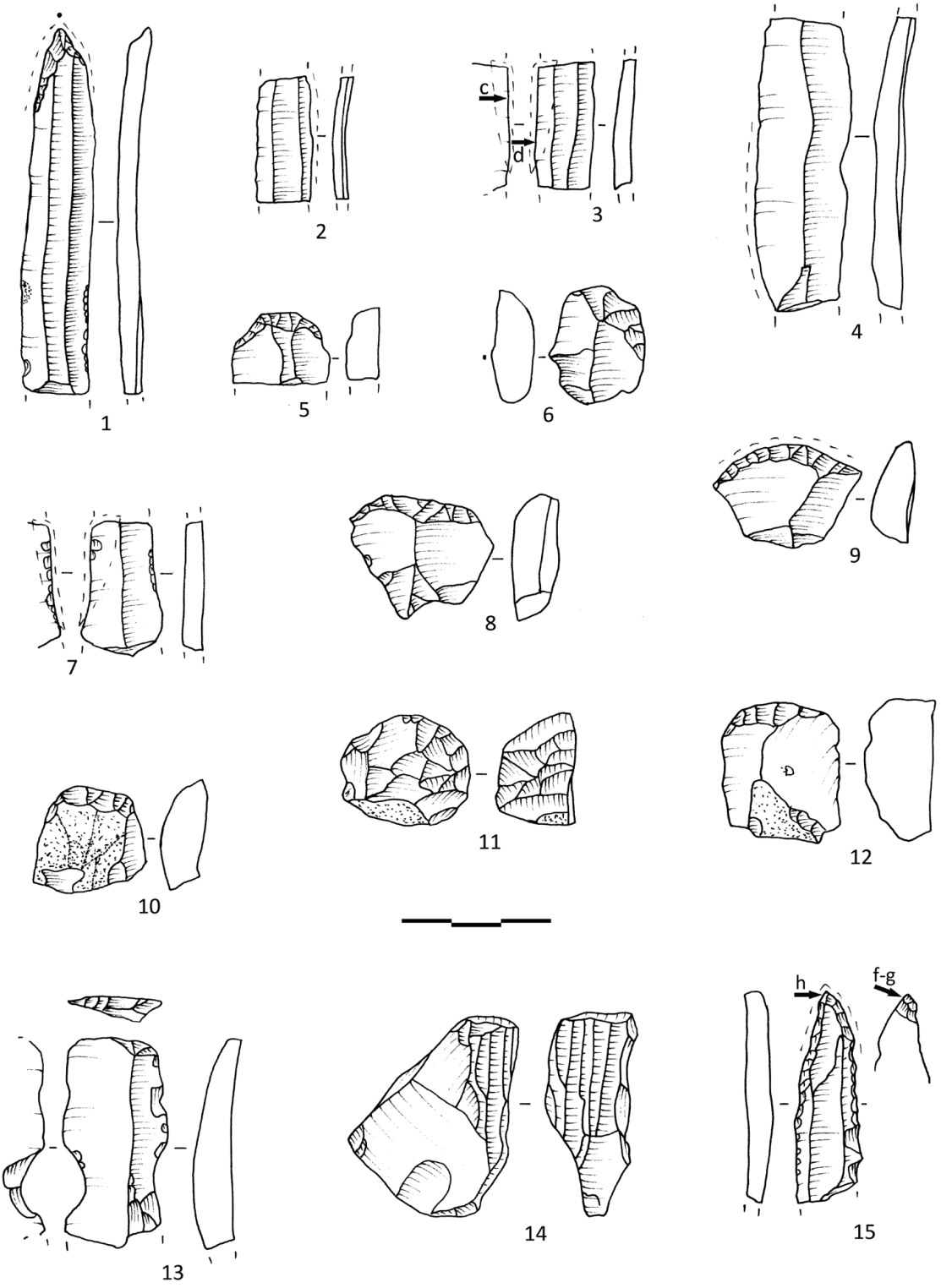


Fig. 142. Blades (2–4), bladelet core (14) and typological tools (1, 3–13, 15). Used edges are marked by dashed lines; the arrows show photomicrographs in fig. 144

quence. Apart from their common features, made mostly on small flakes and having shortened proportions, these endscrapers are quite variable in shape and front fashioning. No noticeable standardization of their production could be defined. Quite unusual is the atypical endscraper on a massive flake, which differs drastically from the small flake endscraper, but its affiliation with the endscraper group and not the retouched flakes is based on the fact that the retouched

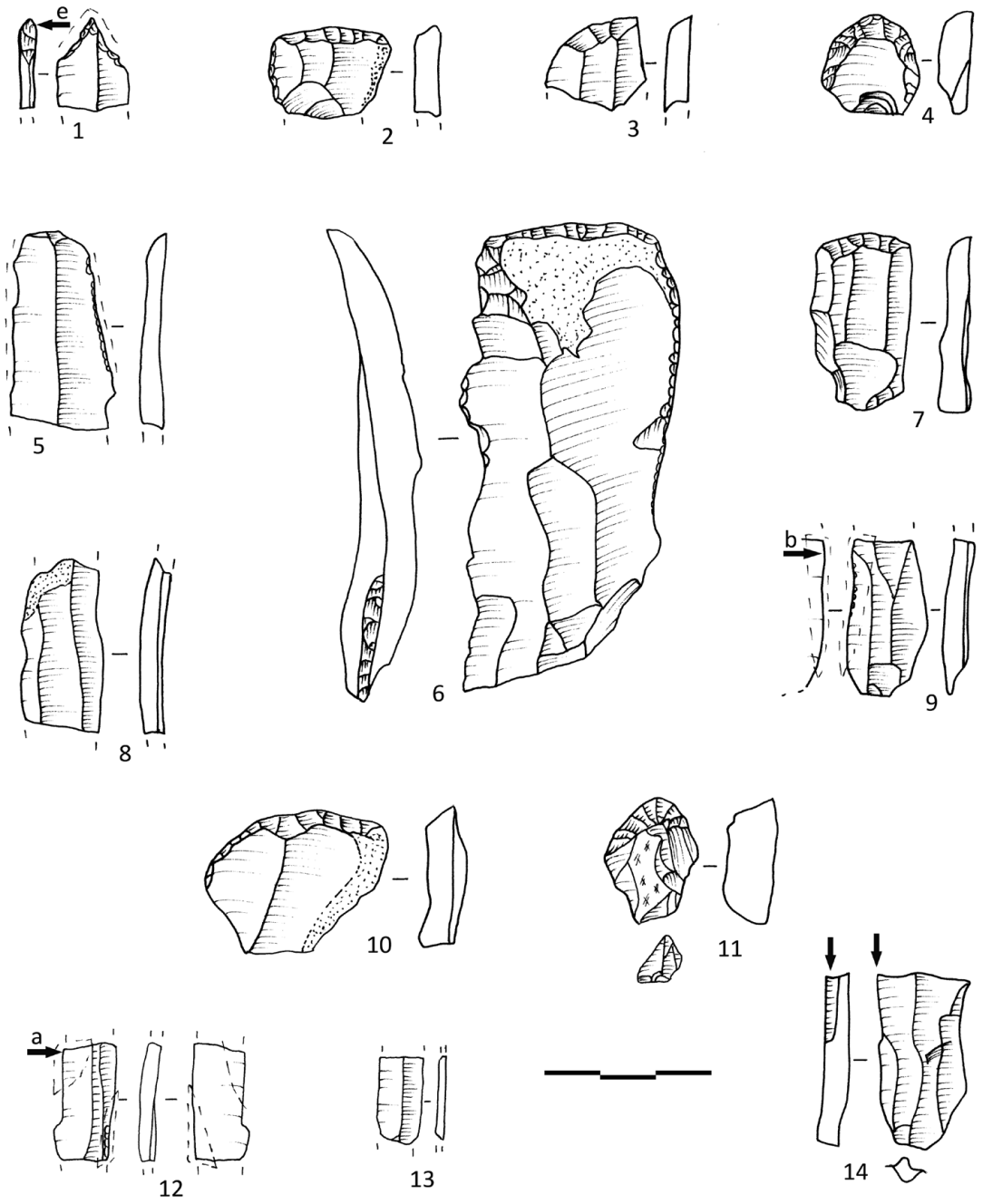


Fig. 143. Blades (8–9, 12–13) and typological tools (1– 7, 10–11, 14). Used edges are marked by dashed lines; the arrows show photomicrographs in fig. 144

flakes have only lateral retouch. The other typological groups are represented by retouched blades (n=5), of which three have bilateral and two have unilateral retouch (figs 142.7; 143.5). One of the blades with partial distal bilateral retouch is fashioned on the largest blank (blade) in the assemblage (7 x 1.8 x 1.4 cm), representing the local raw material – Oreshets type (fig. 141.4 – last artefact). The retouched flakes (n=5) possess discontinuous retouch on their lateral edges and vary significantly in dimensions and shapes. There are three tools with pointed ends: one perforator on the proximal part of a blade of Balkan flint (fig. 142.1); a borer on a Balkan flint bilaterally retouched blade (fig. 142.15), and a micro piercer with broken tip (fig. 143.1.). This is the only typological group in which all tools are used (*vide infra*). There are also single

examples of: endscraper on blade; truncated blade; burin; splintered piece; notched blade (figs 142.13; 143.14).

Debitage products

- blades (n=32), all occurring as fragments: eight proximal, 21 mesial and three distal (figs 142.2–4; 143.8–9, 12–13). The ratio between trapezoidal and triangular sections is 23:9, suggesting an advanced stage of blade debitage. The dimensions vary as follows: length – from 1.5 to 5.8 cm; width – from 0.8 to 2.4 cm, and thickness – from 0.2 to 0.7 cm. The butts are flat (n=7) and one is broken. All blades were removed from single-platform cores using the punch technique, direct percussion, and, eventually, pressure for a few bladelets (fig. 143.13). The bladelet core, unfortunately, has a refreshed striking platform that prevents examination of the removal stigmata on the points of detachment (fig. 142.14). No standardization in blade production is noticeable – neither in the technology nor in the raw material used (only four blades are of Balkan flint). Most of them are made of various raw materials, including the local one of Oreshets type (Gurova et al. 2022b). As for the blade provenance context, half came from distinct features and the other half from the squares/layer of the site (Table 38). Most of the blades belong to the houses and the area between them and the oven. No blade was found in the pit or the light structure;

- flakes (n=38) are scarce, with numbers comparable to those of the tools and blades rather than the fragments. Only five flakes retain cortex. The flakes are amorphous in shape and small in dimensions (mainly between 1.5 and 4 cm), with four exceptions exceeding 4 cm (fig. 139.1). There are four small flakes of < 1.5 cm. Of the butts, flat (single-blow) butts prevail, with rare cases of linear and broken butts. All flakes were removed by direct percussion from single-platform cores;

- fragments (n=203) are the most numerous among the debitage products. Ninety-two are flake fragments and 111 indeterminate chunks, of which a significant number (n=63) are chips under 1.5 cm. Eight pieces are longer than 4 cm. Most of the fragments are from the squares, and only 59 came from features: 17 belonging to the dug-in structure, 11 to house 1, and eight to the space between house 2 and the oven.

Core (n=1), single-platform (with rejuvenation removal) bladelet core of Balkan flint, with removal/knapping platform on the narrow side of a flint concretion. Maximum preserved length of the negatives – 3 cm, and width – between 0.2 and 0.9 cm. No bladelets were found that could be related to the exploitation of this core. The unique core in the assemblage was found in the pit.

Varia (n=3) consist of a massive Balkan flint nodule, used as a hammerstone (fig. 139.4), a flake fragment with cortex and sporadic negatives of secondary debitage (both artefacts coming from the layer). The third piece belongs to house 3 and represents a flint concretion with traces of initial exploitation.

Functional connotations

A selection of artefacts was subjected to use-wear analysis: 20 tools, 16 blades and four flakes – all chosen based on macroscopic observations of the artefacts' surfaces and edges. The traceological observations were undertaken using a stereomicroscope MBS 10 (x100) and a digital microscope Keyence VHX-100[1] (with a magnification range from x25 to x150). The latter was

1 Available for use in the Conservation and Restoration Laboratory of NAIM–BAS.

used for the photomicrographs. The functional determinations were based on secure evidence of macro- and microtraces of use with an emphasis on the latter, because the macrochipping could be due to various taphonomic factors. There are 13 artefacts with identified functions – seven typological tools and six blades. Their distribution by category and worked material is shown in Table 40.

Table 40

Used artefacts	Cereals	Meat/hide	Hide	Stone/mineral	Total
Debitage					**6**
Blades	4	1	1		6
Tools					***7***
Endscrapers			1		1
Retouched blades x1	1		1		2
Retouched blades x2	1				1
Perforator/borer				3	3
Total	6	1	3	3	**13**

Table 40. Distribution of used artefacts by categories according to the worked material

The typological tools involved in identifiable activity consist of all three pointed tools – the borer, used for drilling some mineral (fig. 142.15); the same function in an initial stage is detected on the tip of the micropiercer (figs 143.1; 144.e); and the perforator was used for dry hide-processing (fig. 142.1). There are two blades with unilateral retouch used, respectively, as sickle insert x1 and for bilateral cutting of hide (fig. 143.5). One bilaterally retouched blade served as a sickle insert x1 (fig. 142.7). One fan-shaped endscraper had been engaged in hide processing (scraping) (fig. 142.9). It is noteworthy that only the micropiercer came from the squares/layer of the site; the other used tools belong to distinct structures as follows: the perforator and one of the sickle blades were associated with house 3 (fig. 142.1, 7); the borer and another sickle blade came from the area between house 2 and the oven (figs 142.15; 144.f–h); in the oven area was found the blade for bilateral hide-cutting (fig. 143.5), while the endscraper for hide-scraping belonged to the pit inventory. From the used tools, four are made of Balkan flints – two pointed tools: the perforator and the borer (grey colouristic version); the fan-shaped endscraper on a flake; and two retouched blades serving as sickle inserts.

There are six used blades – two proximal and four mesial fragments, all quite regular and straight in profile. Four blades (two of which are of Balkan flint) had been used as sickle inserts with one working/cutting edge and diagonal (figs 142.3; 143.9, 12; 144a–d). The diagonal cereal polish suggests the use of a Karanovo-type sickle with an oblique insertion in an antler handle. One small blade shows traces of unilateral cutting of meat/fresh hide and, probably, was used as an element of a composite knife for butchering (fig.142.2). The last-used blade (of grey Balkan flint) indicates unilateral cutting of dry hide (fig. 142.4). This blade and one of the sickle blades (figs 142.3; 144.c–d) came from the area between house 2 and the oven; the butchering blade belonged to the inventory of house 3. Two sickle inserts came from the squares/layer of the site (fig. 143.9, 12); one belonged to the dug-in structure.

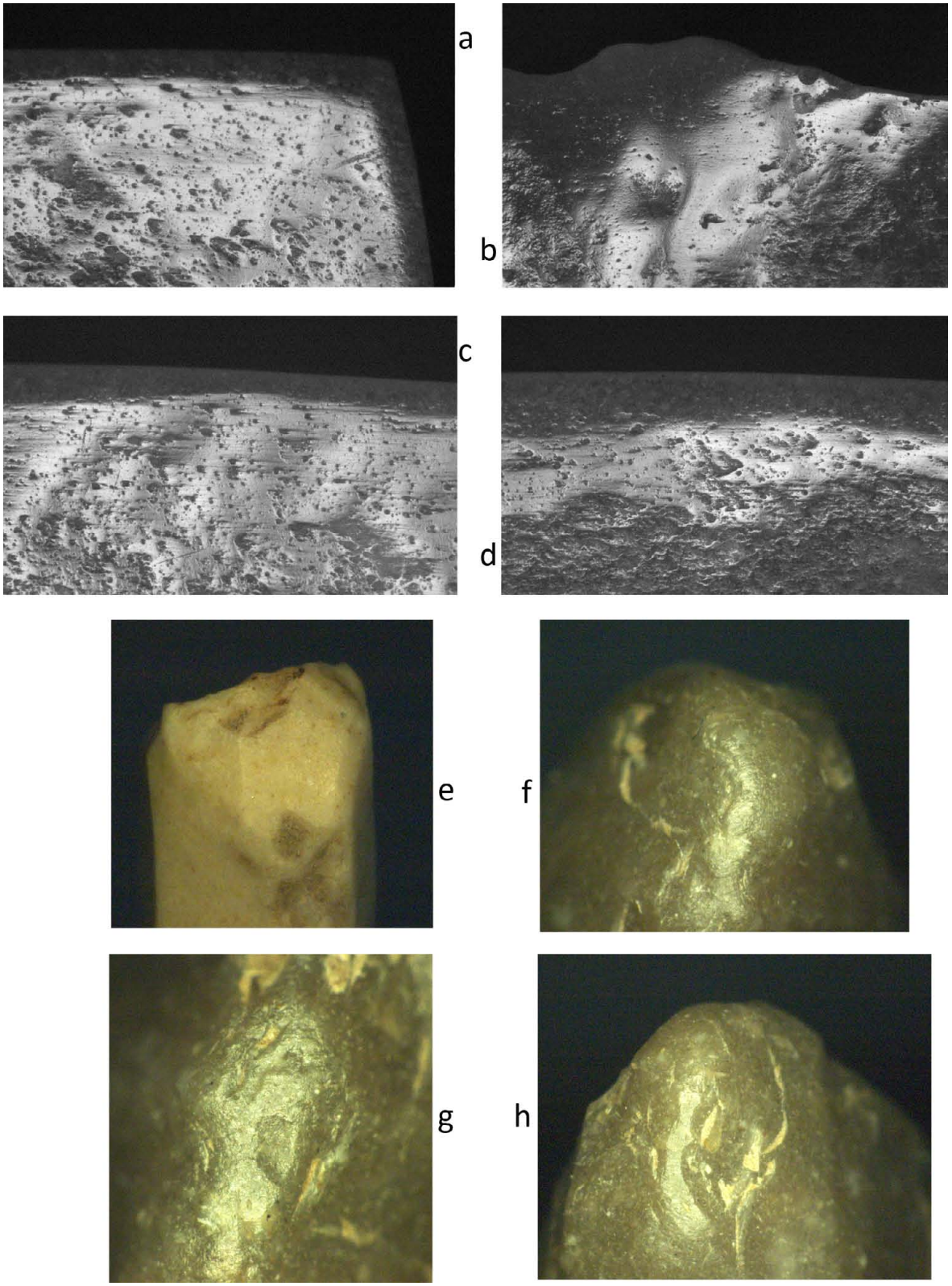


Fig. 144. Photomicrographs of use-wear traces of artefacts on figs 142–143: cereal polish (a–d, x100); drilling stone (mineral) (e–h, x80)

General observations and discussion

The pottery from Brankovtsi suggested affiliation to the Vinča and Gradeshnitsa cultures (Kecheva et al. 2023, 272). Once again (as in the case of Yarlovitsa), a general comparison with flint assemblages from the Serbian Neolithic sequence will be taken into account, as will the short overview of the north Bulgarian chipped-stone assemblages by Gatsov decades ago. The Vinča world has been an attractive topic for researchers for at least half a century. There was a particular focus on chipped-stone assemblages, combining the efforts of many scholars (Radovanović et al. 1984), etc. Without going into the details of this research, some highlights will be presented, including from my study of the Drenovac (2004 season) assemblage, which belongs to the post-Starčevo–Vinča early phases culture (Gurova 2016b). The later assemblage from Drenovac corresponds to the conventional model of the Vinča culture tool repertoire (ends crapers>truncations>retouched blades) (Kaczanowska, Kozłowski 1990, 44). This conventional model was not entirely proven by later studies of some sites attributed to the Vinča–Pločnik I phase (Bogosavljević-Petrović 2001). The site of Divnja Pole, for ex., reveals a spectrum different from the mentioned convention: retouched blades/endscrapers – truncations – denticulates – retouched flakes – side scrapers (Bogosavljević-Petrović 2001, 38).

The assemblage from Brankovtsi matches perfectly with the axiomatic convention of endscraper prevalence. The high frequency of endscrapers on blades is the hallmark of the assemblages, as seen at Vinča Tordoš II and Vinča Pločnik (Radovanović 1984, 46, 61), as well as at Gomolava with the same cultural affiliation (Kaczanowska, Kozłowski 1984, 64; 1990, 44). A similar trend occurs in the assemblage from Gradeshnitsa in northwest Bulgaria. The entire sequence of Gradeshnitsa is dominated by endscrapers, in contrast to the other Early Neolithic sites in western Bulgaria, studied by Gatsov (1993). Gradeshnitsa level C is marked by a change in the typological repertoire and prevalence of endscrapers on flakes, thus resembling the assemblage from Vinča A (ibid., 33). As it was clearly mentioned and shown above, the dominance of endscrapers on flake is one of the secure indicators of Late Neolithic characters of the flint industry in Bulgaria.

Switching the focus to broader issues than typological comparisons, the character of the transformation between the Early and Late Neolithic is crucial and is detectable in various aspects of material culture and social life. The complex transformation in the middle of the 6th millennium cal BC is a multifaceted problem with local and regional characteristics and an unresolved origin, although new explanatory hypotheses are forthcoming (Boyadzhiev 2020). Apart from the changes in raw material supply strategies – a decline in Balkan flint provisioning and an increasing role for local flint sources assuring the sustainability of small-scale expedient production, a marked change in the typological repertoire appears based on microlithization of the industry, one aspect of which is the increasing number of small (ovoid and fan-shaped) endscrapers on flakes. The comparison between the assemblages from the Early Neolithic site of Yarlovitsa and the Late Neolithic inventory of Brankovtsi is a good example of this change in the chipped-stone industry.

As for Brankovtsi itself, the flint artefacts came mainly from the strata in general, but also from all specific archaeological features, with a more obvious presence of typological tools in house 1, the place between house 2 and the dug-in negative feature, where only debitage products were found. There is no evidence in the flint artefact inventories to identify a location associated with a particular activity.

The remnants of developed agricultural practice in the region (attested at Yarlovitsa) persist

during the Late Neolithic, as shown by the number of sickle inserts. As in the case of Yarlovitsa, the lack of palaeobotanical studies can be partially compensated for by data from the adjacent regions in Serbia, where enlargement of the crop range is recorded, with an increased role for emmer (*Triticum dicoccum*) and einkorn (*Triticum monococcum*) (Filipović 2014, 206–207). The comparative diagram of the ubiquity of crop types from Early and Late Neolithic sites from Serbia (ibid., 200, fig. 1) is particularly instructive. A similar diachronic comparative study, based on Neolithic sites in Bulgaria, would be beneficial and enable palaeoeconomic reconstructions by integrating the functional analysis of flint toolkits.

Brankovtsi represents a small but instructive Late Neolithic assemblage, allowing us to delve deeper into the social transformation between the Early and Late Neolithic sequences and shed light on the flint assemblages as one of the factors testifying to these changes.

PART III – DIACHRONIC PERSPECTIVE, DISCUSSION, AND CONCLUSIONS

1. DIACHRONIC COMPARATIVE OBSERVATIONS

1.1. RAW MATERIAL (D)EVOLUTION

Overall, I suggest that the theme of raw material procurement systems in Bulgarian prehistory has long been underestimated, with few publications properly addressing this important issue, even though much useful information on the geological settings of flint-bearing rocks and numerous flint outcrops has been published (Nachev 2009; Gurova, Nachev 2008). A simple, abstract theoretical model and scheme of raw material procurement and supply were presented in the brief overview of Early Neolithic chipped-stone production (Gatsov, Nedelcheva 2009). Unfortunately, it lacked even minimal information on the raw materials present, descriptive, analytical, or geological. In this regard, recent publications have provided valuable insights into the role of supply strategies in the lithic industries across various areas of the Linear Pottery Culture (LBK). These insights have been gained through detailed technological analyses and the use of advanced programmes and models (Allard, Denis 2021; Denis et al. 2021; Kempf, Denis 2024).

Several publications (on the Ohoden and Yabalkovo assemblages) focus on the raw material aspect of the flint industries, offering exhaustive macroscopic descriptions of the various raw materials. The procurement strategy is based on selected sources of raw material (without reference to their geological settings) that exhibit macroscopically similar materials to those of the artefacts. Again, there is no specialized geological analysis nor visualization of the distinct raw materials (Zlateva-Uzunova 2009, 2014; 2025).

Approaches to the problem of raw material supply and distribution should be based on reliable geological and, where possible, analytical data, or at the very least, on adequate macrophotographs corresponding to visually distinct raw materials among artefacts. Our team's publications provide such a dataset for Balkan flint that conforms to scientific standards, ensuring a sound analytical corpus that can be used in future national and international projects (see section 2.3 in Part I).

The study of each flint assemblage should optimally be focused on reconstruction of the *chaîne opératoire*, "from the acquisition of the raw material to the discarding of the tools, and to address questions about the techno-economic organization of raw material acquisition and tool production" (Perlès, Papagiannaki 2022, 198). How can this statement be applied to the supply, distribution and use of Balkan flint?

It has already been stated in section 4.2.2. that Balkan flint supply and distribution decreased during the Late Neolithic. It is difficult to trace the origin of this process, and any simplistic ex-

planation would be speculative, as the origin of the radical change in social structure and material culture in the mid-6th millennium cal BC is not unequivocal. The ratio between the 'special' raw material (in the sense of preferred, frequent, and typically supplied by long-distance distribution) and the readily available local raw materials used in opportunistic production varies significantly. The reason is that in evaluating raw materials, it is not the number of pieces that is most important, but the investment of human effort and the complexity of decision-making in the raw material procurement strategy.

Although Balkan flint outcrops have been identified, we do not know who first exploited them for direct consumption, trade, or exchange. We have evidence of a workshop in secondary deposits of Balkan flint, with remains of nodule extraction and primary core exploitation – the Zhernov workshop. But we do not know whether a settlement with local experts-knappers existed nearby, whether itinerant specialists visited the workshop to procure raw materials and prepare cores, or if both activities were carried out. Workshops at the outcrops could be specialized only for raw material nodule/concretion extraction and core preparation (and eventually exploitation), with a later stage of blank removal and tool fashioning at other workshops – usually near or on sites. As has been observed, apart from Slatina, with three known blade cores and a significant quantity of evidently heat-altered artefacts, we have no other recorded on-site workshop.

A crucial question is when the Balkan flint distribution system began operating and supplying the first farming sites in north Bulgaria. It seems logical that it happened BEFORE the establishment of Neolithic sites, because they display incomplete but well-represented fragments of the Balkan flint *chaîne opératoire*. Balkan flint was present in Upper Palaeolithic assemblages in northern Bulgaria (e.g., the Gravettian sequence at Temnata Cave), indicating that this raw material was distributed and used long before the Neolithic. In other words, the Balkan flint supply and distribution functioned successfully in the pre-Neolithic period, raising the question of whether this exchange continued in some form until Neolithization (Gurova, Bonsall 2014a, 110–111). Recently, the role of Balkan flint (referred to as 'Mezdra flint') in the social network of phases 1 and 2 of Prehistoric Old Europe was discussed by J. Chapman in a wider contextual and conceptual study (Chapman 2020, 323–327). Chapman considers 'Mezdra flint' (meaning the Balkan flint embedded in the chalk/limestone of the Mezdra Carbonate Formation of Upper Cretaceous geological age) as participating in the social inter-site networks of Phase 1 (Mesolithic stage) (Chapman 2020, 21, table 1.1, 323).

Regarding how the Early Neolithic Balkan flint distribution system operated, GIS analysis used in our Balkan flint studies has proven instructive for reconstructing potential pathways of raw material circulation from outcrops/workshops to site consumers. For practical purposes, the following arbitrary boundaries for raw material distribution were accepted and applied: local source distribution – within 0 to 20 km distance; meso-local – within 20 to 50 km distance; regional/extra-local – within 50 to 100 km distance; and supra-regional/long-distance – beyond 100 km. The data are instructive for the Balkan flint networks in Table 2 and the map in fig. 16 in Part I (Gurova et al. 2021b, 2022b). Based on the affiliations of artefacts to raw materials (Balkan flint in this case), the Shumen I type (which is macroscopically similar to Balkan flint and can be found in some assemblages) might have served as meso-local flint for the Varbitsa site. In all other cases of Balkan flint distribution from the Nikopol cluster (persistent among the used sources) and from Gortalovo (where the Balkan flint has distinctive chemical characteristics, and so far has been found only among artefacts from Dzhulyunitsa and Karanovo), the distance between the outcrops and the sites is over 100 km (supra-regional/long distance),

reaching 314 km in the case of Kovachevo.

This network supplied Balkan flint products to all Early Neolithic sites (at least those under discussion). For consumers in northern Bulgaria, the supply included cores and debitage, whereas for sites in the Karanovo I–II cultural milieu, the supply probably focused on blades and finished tools. Using the classification based on raw material circulation in the LBK context, the sites in northern Bulgaria fall into the producer and intermediate site group, whilst those in southern Bulgaria are primarily consumer sites (apart from Slatina) (Kampf, Denis 2024). What is clear, however, is that the formal tools of Balkan flint, represented by blades with semi-steep to steep/high retouch, required regular resharpening, thus becoming progressively narrower. It is difficult to determine when and why this network ceased operating, as most sites with Balkan flint formal tools do not contain later sequences. It was most probably not related to source accessibility (as hypothesized by Gatsov), but rather to a new decision-making process oriented towards local, easily accessible resources, as a consequence of bigger changes in the social structure. Tell Karanovo, however, is an example of continuous habitation, and the fact that formal tools decreased in quantity but continued to be used suggests a provisioning crisis.

The decline in the regional Early Neolithic *oikoumene* (with many sites abandoned) and re-establishment in a new landscape (see Boyadzhiev 2020, Grębska-Kulow 2017; 2024) inevitably led to adaptations to new circumstances and changes in decision-making across many aspects of everyday life, including the supply of raw materials. At that time, people seemingly turned to opportunistic production, driven by the easier acquisition of raw materials from readily available local sources (mainly secondary deposits). The local and meso-local distributions are based on more readily accessible outcrops/deposits than in the previous Balkan flint networks. Thus, local raw materials started to dominate over the reminiscent Balkan flint products, which remained valuable and used in all Late Neolithic sites studied by me, with a particular presence and significance in Sarnevo (Case study no. 7). I hypothesize that people from the Early Neolithic sites with Balkan flint formal tools and other products brought these artefacts with them when leaving their settlements/villages ca 5500 cal BC. It is not a great labour to bring several kg of precious objects. They continued to use them at their new places of residence (such as in Apriltsi, why not at Harmanli too) or at new ritual sites (such as Sarnevo, as interpreted by the discoverers). Changes in site locations may partially explain why artefacts (including Balkan flint formal tools) are scarce in some newly established Late Neolithic sites, such as Apriltsi, and virtually absent from some large, abandoned Early Neolithic sites, such as Mursalevo in the Struma Valley[1].

A very instructive example of the functioning of Balkan flint *vs* local raw material supply and distribution is the comparison of the assemblages from the Early Neolithic site of Yarlovitsa and the Late Neolithic site of Brankovtsi – both sites (ca. 30 km apart) are located in northwest Bulgaria, in a Neogene rock sequence devoid of flints. There were, however, sedimentary carbonate strata of the Upper Jurassic–Lower Cretaceous West Balkan Carbonate Group, where several outcrops of low-quality local flint were identified during our fourth survey (see section 2.3.2). The analyses of sampled artefacts and the local raw materials, compared to the results from the Balkan flint outcrops in the Pleven–Nikopol cluster of sources, yielded interesting results (Gurova et al. 2021b). The artefacts from Yarlovitsa show affiliation to the Balkan flint mi-

1 My thoughts about the prehistoric inhabitants of Mursalevo, taking with them their formal toolkits after deliberately burning the houses, were shared in a personal communication with one of the excavation directors, Prof. V. Nikolov.

cropetrographic and chemical characteristics, while the Brankovtsi samples are associated with local deposits as well as with Balkan flint sources. GIS analysis has facilitated a preliminary reconstruction of the supply zones of local raw materials *vs* Balkan flint in northwest Bulgaria. Consequently, the distances of the site to local outcrops varied from 16 to 50 km, while the distances to the Balkan flint outcrops varied between 145 and 211 km (ibid., 255–256). The assemblages from Yarlovitsa and Brankovtsi are clearly different from a raw material standpoint – Yarlovitsa with a much more homogeneous assemblage characterized by a strong dominance of Balkan flint in all artefact categories and a drastic difference of a series of local small nodules with testing removals (fig. 85 contra figs 79–83) and Brankovtsi, with a heterogeneous assemblage of various raw materials (figs 139–141).

A good example of a raw material with an exotic and sporadic appearance in the Early Neolithic but not later in the Neolithic sequence (in the current state of knowledge), is obsidian. There are two sites (Dzhulyunitsa and Ohoden) that have yielded, respectively, two and six obsidian artefacts, and only one site in southern Bulgaria (Dzherman) with a single piece. Five of the pieces (four from Ohoden and one from Dzherman) came from the C1 (Slovakian) source area in the Carpathians, while four (Ohoden and Dzhulyunitsa x 2 ex.) came from the C2 (Hungarian) source area (Bonsall et al. 2017, 51). The obsidian artefacts among the Early Neolithic assemblages are too scarce to yield meaningful insights into their purpose and function in the households of the communities where they occur. Most likely, their sporadic appearance is related to the exchange of goods and exotica between the groups, and did not rely on fundamental needs for community life.

As for the Late Neolithic flint assemblages, they exhibit variability in raw materials across all aspects of chipped-stone production and use. As mentioned above in section 4.2.2, the raw material provisioning was based on readily available local siliceous rock deposits, mainly secondary and accessible in river gravel accumulations and/or in accessible quarries within limestone formations.

1.2. TECHNO-TYPOLOGICAL FEATURES IN COMPARATIVE PERSPECTIVE

The Neolithic flint industry is marked by two extremes – from macroblade production in the Early Neolithic to microlithization in the Late Neolithic. It is a very impressive transition with an impact on all aspects of techno-typological parameters of the assemblages. The macroblade *chaîne opératoire* is a problem that occasionally mobilizes the brainstorming efforts of some specialists but remains enigmatic. Here, I will focus on a couple of points (touched on in previous publications (Gurova 2008a, 135; Gurova 2012b, 18, 21). It is cognitively stimulating, but not realistic, to expect evidence of a direct connection between the Balkan flint macroblades from Bulgaria and some desirable Anatolian 'homeland'... not least because, as stated by Özdoğan, any comparison between Anatolian and Balkan assemblages should be done "without overstating the presence or the absence of selected objects" (Özdoğan 2006, 23). As another theoretical framing concept about what and how was transferred during Neolithization mobility, it is noteworthy that the opposite approach (focused on elements that were not transferred) is demonstrated by C. Perlès (Perlès 2005). A similar approach involving the selective diffusion of social practices (particularly residential and construction practices) has been successfully applied within the broader context of Neolithic discourse by M. Brami (Brami 2017).

The origin of the Balkan macroblades is a topic that intensely engaged the attention of J.K. Kozłowski, who defined it as "one of the most puzzling questions of the Balkan pottery Neolithic" (Kozłowski 2007, 49). As possible areas of origin for this phenomenon, Kozłowski men-

tions the aceramic context in Thessalian tells, the PPN of Cyprus, and the obsidian industry of Sykinos Island in the Cyclades (ibid., 49). Later on, he added to this hypothesis the possibility of a trans-Aegean contact with western Anatolia, envisaging Ulucak and Çukurici (Gatsov et al. 2017, 66). The question remains unresolved, and it is better to focus on the macroblades displayed in the Bulgarian Early Neolithic that enabled the fashioning of the Balkan flint formal tools. Each macroblade debitage/removal depends on two main factors – suitable raw material/flint for cores *mise en forme* and knappers with sufficient skills to maintain a successful core reduction system. Balkan flint definitely responds to knapping property requirements. However, on the question of the identity of (itinerant) knappers, or people with 'new personal skills' (in the sense of Chapman and Gaydarska, 2011), there is no unequivocal answer. I see one plausible origin of the know-how for detaching blades matching formal tools in the Marmara milieu, based on my personal experience with the assemblages from Ilıpınar and Menteşe. There, a spectacular series of regular blades removed by pressure and indirect percussion is found (Gurova 2012b, 20 and references therein; see also the discussion here). The solid know-how of producing blades in series from high-quality flint (such as Balkan flint) could not be easily achieved. Still, it can be successfully initiated and subsequently improved by adapting knapping skills to the favourable mechanical properties of Balkan flint. Nevertheless, this was accomplished, resulting in blades that met the standards of those from Dzhulyunitsa, Yarlovitsa and Slatina. This led to the formal toolkits presented in the previous sections.

Articulated another way, the main problem for creating a plausible explanatory model concerning the emergence and distribution of Balkan flint formal toolkits over a vast territory has two aspects – the conjunction of the macroblade technology (including the typological repertoire) with a successful procurement strategy assuring suitable nodules for preparation and maintenance of cores about twenty cm long, and successive debitage of a series of regular blades. In the context of the exchange networks of raw materials and precious products, it is worth recalling the following: i) During the Neolithic, the prevalence of exogenous materials was common, and their distribution became a structured network based on specialized production and producers (Perlès, 2007, 2012); ii) The acquisition of high-quality raw materials from distances of 400–500 km became common (Binder, Perlès, 1990, 260). The following statement by C. Perlès is also noteworthy:

"Les paramètres d'analyse peuvent être regroupés autour de quatre thèmes: la *distribution des sources* et les savoir-faire nécessaire à leur exploitation, l'*organisation de la production*, notamment en termes de savoir-faire, d'investissement technique, de degré de spécialisation, d'investissement stylistique, etc., *les paramètres de consommation* des produits – origine et quantité sur un site donné, répartition au sein du site, usage –, et, enfin, les *paramètres de distribution* des produits – connaissances et savoir-faire nécessaires à la distribution de produits, quantité en circulations, distances maximales de circulation, décroissance des quantités quand on s'éloigne des sources, etc." (Perlès 2012, 541).

In the Dzhulyunitsa repertoire, there are virtually no formal tools, despite the availability of blanks for their manufacture. On the other hand, a few cores may be related to the Balkan flint *chaîne opératoire*. The intriguing bidirectional core (naviform-like) is made of dark-grey white-spotted flint, from which blade removal was practised via direct percussion, perhaps using a soft (antler) hammer and does not belong to the Balkan flint *chaîne opératoire* (figs 64.2; 72.2). The site's inhabitants seemingly produced and distributed blades made of grey, white-spotted flint, as well as Balkan flint blades, despite the absence of the initial stages of the Balkan flint *chaîne opératoire*. They were also consumers of blades, some of which were used

for household activities.

Another explanation could be that in some unexplored part of the site, there was a workshop area for core exploitation and/or tool manufacturing. Probably not particularly interested in formal toolkit use, the flint workers from Dzhulyunitsa may have decided later to devote their efforts to acquiring and circulating high-quality raw materials (both Balkan flint and grey white-spotted flint) and their by-products to site consumers. The real producers of the formal tools could be the enclaves of the (pre-?) Karanovo I culture in Thrace with whom the north-central Bulgarian population established contact at the time of, or rather before, white-painted pottery was locally "invented" and broadly distributed "… as a result of the need for consolidation and self-identification of the newly-formed community whose immigrants probably had come from various sites in the original Anatolian area" (Nikolov 2007, 187). Such a local invention of the Balkan flint formal tools, whose appearance is sufficiently representative to serve as self-identification and evaluation, is easily envisageable. It seems to me very reasonable to expect that white-painted pottery and Balkan flint formal tools (the main characteristics of the Karanovo I culture) were invented together in a *favourable milieu*, and that both were embedded traits of local identities and the self-affirmation of their bearers.

The sites of Yarlovitsa and Slatina could have been redistributors of Balkan flint products, respectively, to the Iron Gates (Yarlovitsa) and the Sofia Plain and Struma Valley (Slatina), as they likely needed primary distributors for their own provisioning with Balkan flint.

Once removed by indirect percussion (punch technique), the (macro)blades of Balkan flint continued their biography, being used directly (mainly as sickle inserts) and undergoing sequential resharpening (also demonstrated on fig. 21), or modified into various types of retouched blades. The retouching was accomplished through pressure flaking using an antler stick (retoucher). Apart from this optimal method, many incidental forms of 'retouching' are plausible – scarring due to use or taphonomic alteration, or intentional retouch using an *ad hoc* stick or simply pressing the blade against a hard platform. My macro- and microobservations of numerous series of Balkan flint formal tools (retouched blades) unequivocally suggested multiple instances of rejuvenation/resharpening of their lateral edges. Balkan flint sickle inserts provide the clearest examples of this procedure. Starting with their use as virgin blades, their edges required systematic reversal and resharpening. Thus, the edges became gradually abrupt, and the retouch on them progressively (and unavoidably) higher and steeper. In this respect, we can say that the formal tools reveal a technological dichotomy – apart from the initial, deliberately abrupt retouch performed by the knapper, a significant part of them can be attributed to a maintenance strategy consisting of systematic resharpening for utilitarian needs.

There is a crucial detail to be clarified: no evidence for lever pressure on relatively large blades is recorded among the Early Neolithic assemblages from Bulgaria. The oldest European lever pressure is known on Early Neolithic blades from Greece, in two examples: from stratum 31c at Argissa in Thessaly (ca 6500 cal BC) and from Franchthi (Argolid), dated between 6600–6000 cal BC (Guilbeau, Perlès 2019, 513). These examples are reported by the best specialist in lever technique experimentation, J. Pelegrin (Pelegrin 2006, 48). As for the pressure technique *sensu lato*, my own observations suggest rare examples of entire blades with parallel edges and ridges, prepared by abrasion overhang, with high-placed, prominent bulbs and small butts, indicating pressure debitage. Such blade characteristics are sporadically attested in the assemblages from Slatina (Gurova 2012b, 11–12), Kovachevo, Dzhulyunitsa, and Yarlovitsa (see Case studies nos 2–3). However, the frequent use of the pressure technique still needs to be confirmed based on a more detailed comparative analysis in further research.

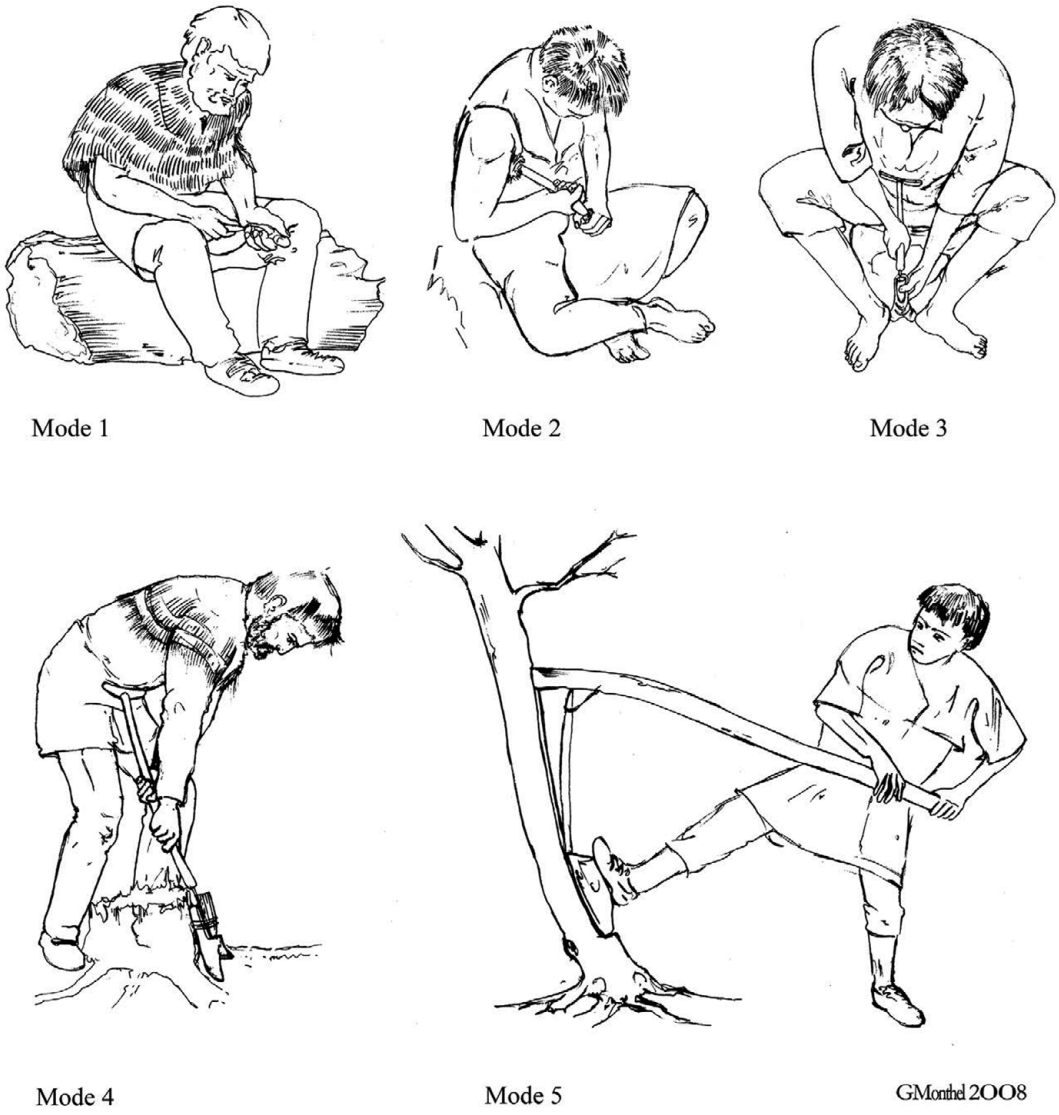


Fig. 145. The modes of pressure flaking as defined by J. Pelegrin (fig. 1 reproduced from Guilbeau, Perlès 2019, 512)

On the other hand, the pressure technique can be attributed to the small cores and micro-cores, which are common in Late Neolithic assemblages and represent one of the most notable traits of microlithization in the industry. Many publications have addressed the origin, evolution, and distribution of pressure debitage, including morphological and metrical stigmata that identify this technique (Astruc et al. 2007; Binder 2007; Binder et al. 2012; Pelegrin 2012). Our assemblages provide rare examples of small, light blades with readable characteristics, facilitating the detection of reliable removal techniques. More instructive are the exhausted small cores from Late Neolithic assemblages. They are not of the conical/bullet types, which are very characteristic of the pressure debitage in the Near East and Anatolia. Our cores have various shapes, with usually plain, striking platforms (varying in inclination), flat (to slightly convex) removal surfaces, and relatively parallel arises. The widths of the blade/bladelet negatives vary mainly between 0.7 and 10 mm, suggesting the use of Mode 3 of pressure, with a short crutch in a sitting position (Pelegrin 2012, fig. 18.6). However, without overly relying on metrical stigmata, offered by the specialists, pressure by handheld stick and core (Modes 1 and 2) are also applicable (ibid., figs 18.1–2; 18.4) (see figs 119–120; 125; 130; 136–137; 145; 147).

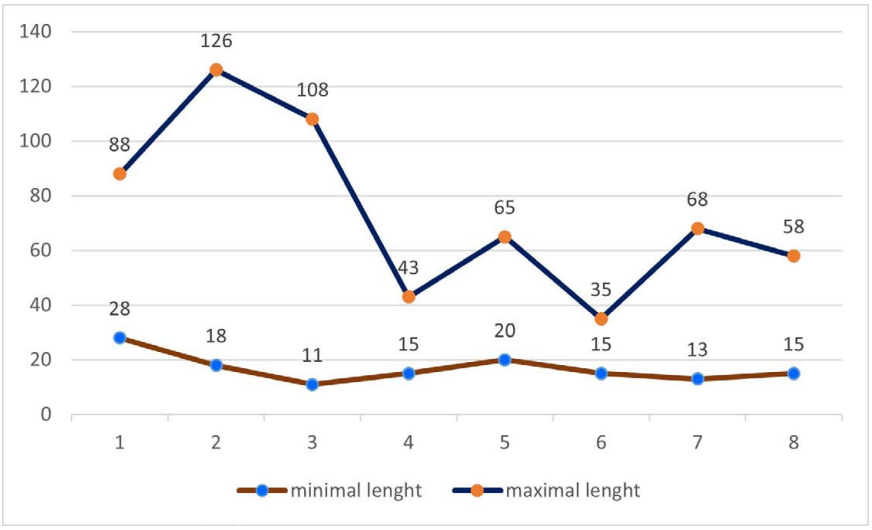


Fig. 146. Blade lengths in mm per sites presented as Case studies: 1. Varbitsa; 2. Dzhulyunitsa; 3. Yarlovitsa; 4. Ilindentsi; 5. Yabalkovo; 6. Harmanli; 7. Sarnevo ; 8. Brankovtsi (valid for all diagrams)

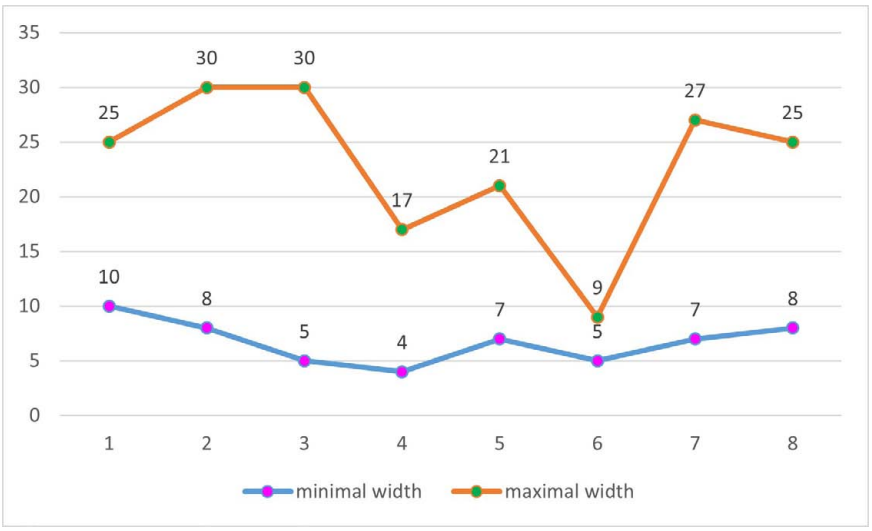


Fig. 147. Blade width in mm per site presented as case studies

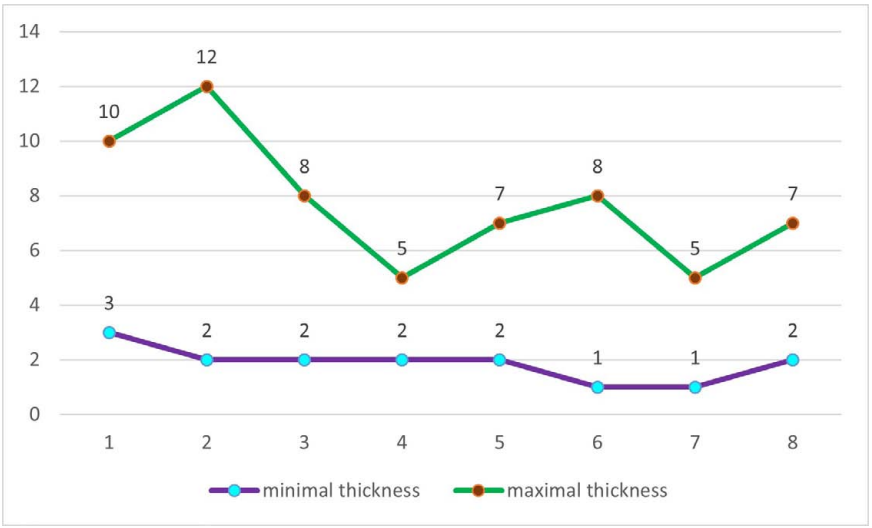


Fig. 148. Blade thickness in mm per site presented as case studies

To illustrate the change in blade parameters from Early to Late Neolithic, I present several diagrams prepared from metrical data of the case studies (figs 146–148).

The diagrams suggest a significant variability in blade metrics, but it should be taken into consideration that the lengths are relative, because they are based mainly on fragmented items; also a peculiar assemblage such as Sarnevo, which is interpreted not as a settlement but as a complex with ritual functions, shows more specific features, including a strong component of Balkan flint artefacts and formal tools possessing the characteristics of the Early Neolithic industry from which they derive.

There is a conventional view that bladelet detachment and standardization are necessary for the production of geometric microliths from the Mesolithic and later periods of prehistory. In our series of geometric microliths, this concept seems more applicable to the Late Neolithic (with many more microliths), rather than to the Early Neolithic microliths (figs 33, 51). In my experience (and based on published accounts), there is only one microcore for bladelets within the Early Neolithic assemblages, and it comes from Yarlovitsa (fig. 83.1). Comparing the microliths from the Early and Late Neolithic, no signs of standardization in any of the complexes are evident. The most 'elaborate' technically seem the trapezes and segments from Drama–Gerena (Lichardus et al. 2000) (fig. 51.1). Some of these trapezes, as well as examples of Early Neolithic trapezes from Kovachevo and Ohoden are more than 12 mm wide, which means they exceed the standards of Modes 1–3 of pressure debitage and did not require special blank preparation. Currently, there is only one specialized publication on the geometric microliths from Bulgaria (Gurova 2017b). The cited paper presents the heterogeneity of microliths from both periods of the Neolithic sequence, along with brief technological notes and functional connotations of the artefacts that I have studied personally. From a chronological perspective, the geometric microlith series can be seen as trajectories to different cultural contexts. They raise various interpretative questions, which deserve to be cited, because the statements are still valid: "i) the Early Neolithic series (Kovachevo and Ohoden) could be linked to a still enigmatic Mesolithic/pre-Neolithic stratum, which subsequently assumed a role in the Neolithization of the Balkans. Unfortunately, no secure evidence of such a substratum is forthcoming and any conceptualization in the current state of knowledge would be speculative; ii) to date, the numerous series from the Late Neolithic have two different interpretations: J. Lichardus argued that the appearance of microliths at Drama–Gerena was more "a response to a specific function or activity than a result of a particular cultural scheme or tradition" (Lichardus et al. 2000.6). In contrast, the multiperiod series of geometric microliths from Durankulak, viewed in a local and supra-regional context, led N. Sirakov to assume similarities with the Dikilitash assemblages (affiliated to the Tardigravettian and Mesolithic culture in Southeast Europe) and with the Tardenoisian assemblage to the northeast of the Black Sea. These cultural affiliations are cited as evidence for the important role of a local Mesolithic substratum in the Neolithization of the Balkans (Sirakov 2002, 228). The present author's opinion is much closer to the first explanation, which interprets the microliths (which occur in series rather than as single, accidental artefacts) as an element of the adaptation and decision-making strategy of prehistoric populations. In this respect, the Late Neolithic assemblages with microliths are intrinsic to the radical changes in material culture that took place after 5500 BC, and the microlithization of the flint industry is just one aspect of this change" (Gurova 2017b, 280).

The Early Neolithic microliths, despite their scarcity, could eventually compensate for the lack of pointed arrowheads, which are typical of the PPN and the Neolithic in the Near East and central Anatolia but are missing in northwest Anatolia and the Balkans (Гюрова 2005). Typi-

cal projectile points (with pointed tips designed for penetration) are also absent from the Early Neolithic period in Greece, and C. Perlès mentions them among the non-transferred Neolithic elements (Perlès 2005, 283). Geometric microliths reappeared in the Late Neolithic with the same anticipated projectile point function, as they were, in fact, the only known weapon elements among the local Neolithic groups.

To summarize: The geometric microliths from the Neolithic strata warrant further study, shedding light on many technical details through time. The variability in morphometric parameters, retouched edges, and general shape (isosceles *vs* scalene) requires a more detailed techno-typological analysis to shed light on the reasons for the variations in form and manufacture and, lack of standardization. A thorough study based on uniform descriptive criteria, terminology, and interpretation would be a significant contribution to the study of geometric microliths in both local and broader contexts.

The typological changes taking place during the Neolithic sequence may be summarized as follows:

- Early Neolithic: i) dominance of retouched blades, among which the most representative are the formal tools (retouched blades and sickle inserts); variability in the proportion of other typological groups derived from the regional patterns and specifics of household organization (an example being the micropiercers/drills in the Kovachevo and Ilindentsi assemblages); iii) marked preference of high-quality flint (Balkan flint) for toolkit manufacture;

- Late Neolithic: i) increased role of local raw materials and limited demand for Balkan flint; ii) a decrease in large, ordinary blade production and the prevalence of flake debitage with subsequent transformation into tools on flakes (mainly endscrapers); iii) the great diversity of endscrapers both in typological and morphometric parameters, but with apparent shortening of proportions and increased shape variation; iv) microlithization is represented by microcores for blades (bladelets) and two categories of retouched artefact: (very) small endscrapers on flakes with oval (semicircular) shape, and geometric microliths *sensu stricto* (trapezes, crescents/segments and rare atypical shapes).

The typological repertoire is visualized with the main types of tools and selected types (most diagnostic) in the following two diagrams (figs 149–150). The dominance of retouched blades at Yabalkovo and Sarnevo is extreme. In the case of Yabalkovo, this may be because I was provided with only a subset of the entire assemblage, which may give a distorted impression. As for Sarnevo, the particularity of its assemblage was mentioned above. What is well demonstrated, however, is the significant increase of flake endscrapers and geometric microliths in the Late Neolithic.

1.3. FUNCTIONAL CONNOTATIONS OVER A LONG TIME SPAN

Use-wear analysis of flint artefacts is an irreplaceable cognitive tool with significant information value and utility for a better understanding of prehistoric toolkits, households, and subsistence activities of human groups. From the very beginning of my research on the flint assemblages, I have systematically employed a traceological approach, combining macro- and microobservations and applying primarily microtraces of use, followed by macrotraces, which have formed the basis of my functional interpretations. The functional connotations of the flint artefacts provide sensible additional information on the tools. They are instructive in the ongoing discourse on typological *vs* functional nomenclature and classifications. It is difficult to give an overview of the functional/utilitarian features of the studied Neolithic assemblages because each case study is peculiar in many aspects concerning the artefacts themselves, as well as the

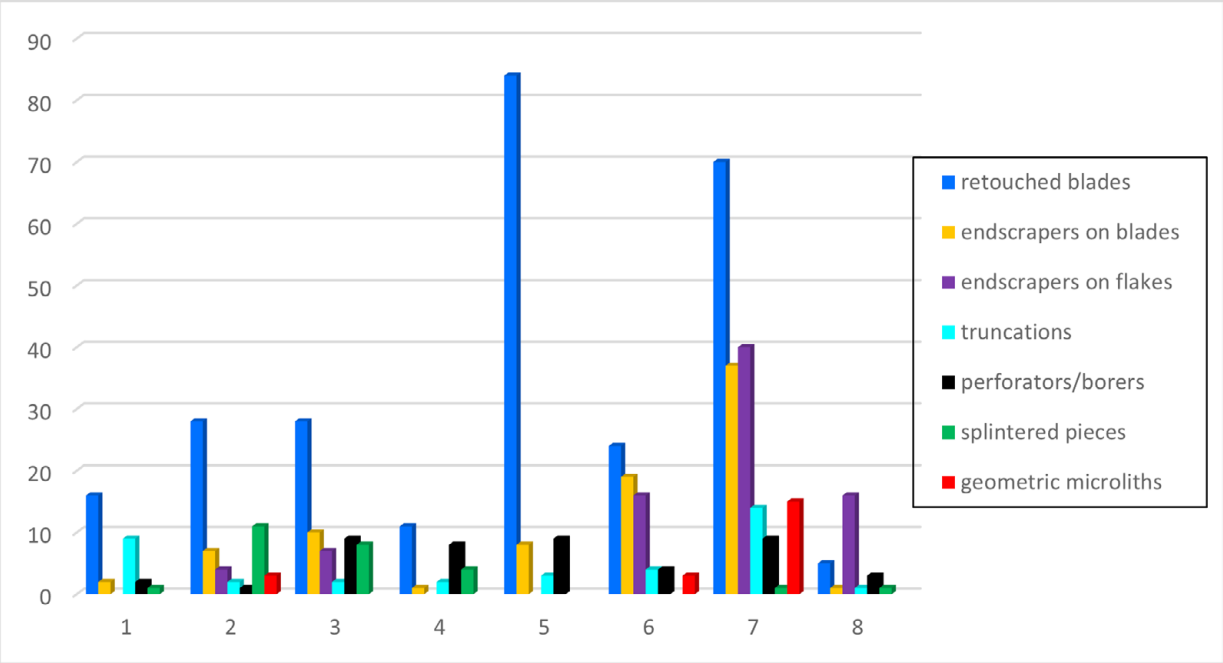


Fig. 149. Tool repertoire per site presented as case studies

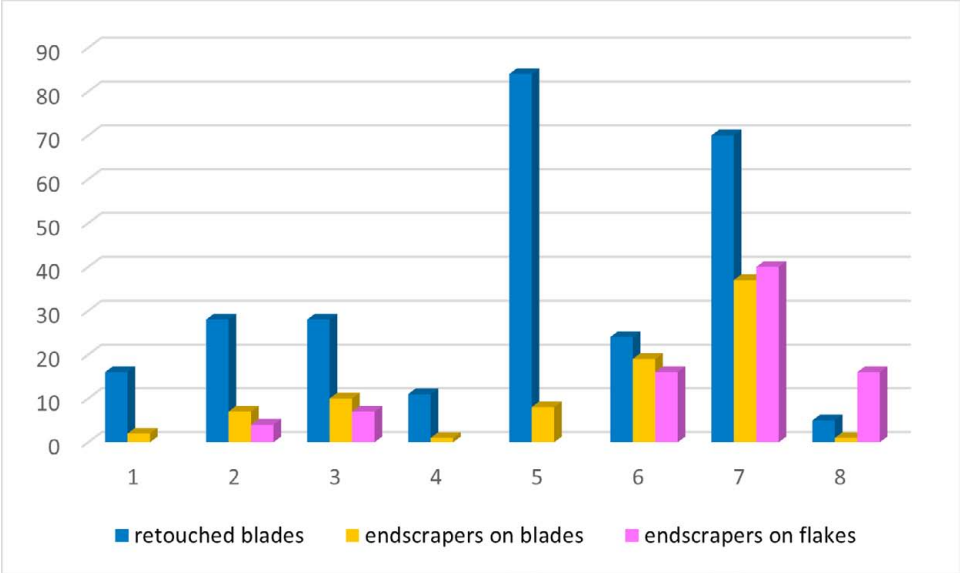


Fig. 150. Selected tools per site presented as case studies

investigation conditions of the sites to which the studied samples belong: i) the completeness of the studied materials – do they represent entire assemblages or selective representative samples; the condition/preservation of the artefacts – in some cases, natural and/or taphonomic factors hinder the analysis and make it incomplete; iii) the contextual background and value of the artefacts; iv) the excavation strategy practised on the sites, etc.

My dataset on the functional features of artefacts from the studied assemblages is instructive for each concrete assemblage (see the Case studies section above) and, in general, for the main trends in the use of the artefacts. Still, it does not allow for exhaustive and reliable diachronic comparison between them. This is why I focus on selected tool categories, whose functional analyses I consider the most trustworthy for interpretation and commentary here. These groups of artefacts are: i) the sickle inserts because they are easily recognizable on the macro level, and

no piece is omitted from my use-wear analysis; ii) the geometric microliths, whose scarce number and sporadic appearance allowed all items from the assemblages available to be observed. Both artefact categories relate to the subsistence activities of Neolithic people and are treated as 'fossiles directeurs' in a broader context of agriculture and hunting.

We have two excellent examples of toolkits that directly refer to a specialized production type – the micropiercers/borers from Kovachevo and Ilindentsi, whose analysis here is limited to the second site (Case study no. 4) and is aided by experimental work on prehistoric drilling (Gurova et al. 2013). More meticulous analysis and comparisons between the toolkits from both sites and their settlement contexts are needed to reveal the extent of specialization in their production. Here, let us remember the definition formulated by C. Perlès: "Specialisation is here defined as an activity done by a limited number of groups or individuals, to redistribute the products (or services) within a wider community. It usually, but not necessarily, rests upon knowledge, skills or equipment not possessed by the others. Craft specialisation, thus defined, can go hand in hand with other subsistence activities and need not be full-time…" (Perlès 2001, 208, footnote 19). Further research is required to fully integrate the nuances embodied in the notion of "specialization" into the scholarly literature at a gnoseological level.

As for the sickles, they have always been in the focus of research on farming communities – from the PPN in the Near East (Cauvin 1983) till the detailed analysis of the changes in harvesting (as a key activity of the new food-producing economy) in the Mediterranean – from Knossos on Crete to the Vale Pincel 1 in Portugal (Mazzucco et al. 2020).

I was privileged to work with assemblages from Tell Karanovo, where several antler handles were found, shedding light on the construction and style of the composite sickles with obliquely inserted flint elements, thus forming a serrated, efficient working edge (see Gurova 2016a, fig. 2). The best example from Tell Karanovo, belonging to the Karanovo I culture, became famous as the Karanovo sickle (fig. 21). A significant part of my publications was devoted to prehistoric agriculture and the sickle as one of the most important tools with a very prolonged "life", remaining in use well into, and even throughout, the Metal Ages. In particular, I was concerned with the origin and dispersal of the sickle with a curved handle and serrated edges, the morpho-typological characteristics of the sickle inserts, the microwear features of the used sickle elements, etc. (Гюрова 2001; Gurova 1997; 2002a, 2005a; 2006; 2008d; 2012b; 2014a; 2016a; 2018a).

The sickles appear at Early Neolithic sites in Bulgaria, fully evolved, as part of the Neolithic package. They are present in the earliest strata of Kovachevo (before the adoption of Karanovo I cultural traits). They are also present at Dzhulyunitsa, but they undoubtedly reach their apogee during the Karanovo I culture, becoming one of its emblematic features. The sickle inserts found at Early Neolithic sites are numerous and exhibit morphological and typological variability. There is no evidence of morphometric standardization of sickle inserts; they consist of virgin and variably retouched blades measuring 2–5 cm in length and 1–3 cm in width. Of the sickle inserts made on typological tools, it is mainly (bi)laterally retouched blades that predominate. In absolute numbers, sickle inserts are the most common Early Neolithic tools with utilization traces. Among the sickle inserts, a particular category is the Balkan flint sickle elements, which are a prominent part of the formal toolkits. They usually exhibit durable use (obviously preferential) and shiny, angular polishes (from slightly oblique to diagonal) on the working edges, which were resharpened (sometimes continuously) until the working edges became abruptly retouched (see Gurova 2005a, 5, fig. 2). Sickle-blades with parallel lateral polish are extremely rare. The Karanovo type of sickle is widely recognized as one of the most

efficient prehistoric agricultural tools, with origins traceable to the Fertile Crescent, and close parallels at Neolithic Hacılar in the Lake District of Anatolia. The Hacılar type of sickle was recorded among the extensive series of blades with diagonal cereal polish in the assemblages from Ilıpınar and Menteşe (Gurova 2001; 2006; 2008b).

During the Late Neolithic, the same type of sickle seems to have been used, despite changes in the chipped-stone industry. Sickle inserts remain the most numerous category among the used tools. More of them (particularly in the tell sites with noticeable continuity with the preceding Early Neolithic strata) are the same Balkan flint formal tools that persisted as a reminiscent form of the Early Neolithic formal toolkits. Another category of sickle inserts consists of unretouched blade fragments, but soon after their use, utilization retouch appears, and/or some resharpening is done. Therefore, the most common sickle elements remain the retouched blades. Neolithic sickles can be reliably identified not only by the typical micro-use wear of their flint inserts, but also by some complete or fragmented hafts made from *Cervus elaphus* antler. Fragments of antler handles are found in the sites of Samovodene, Provadia and Ovcharovo–Gorata (northern Bulgaria) as well as from the sites of Karanovo, Kazanlak, Chavdar, Kovachevo, Sapareva Bania, and Stara–Zagora (Okrazhna Bolnitsa) (south Bulgaria) (see Gurova 2012b, fig. 2). Unfortunately, some of these important finds remain unpublished. Wooden hafts are not preserved or reported. It is noteworthy here that, according to C. Perlès, the antler handle of the sickle is part of the Anatolian Neolithic package; it is absent from the Near East and Greece, but present in Bulgaria (Perlès 2005, 278).

Of particular interest is the occurrence of four entire sickles with antler handles and inserted flint flakes from the Late Neolithic at the Provadia–Solnitsata site. The sickles were found at the bottom of the cereal storage bin in a house and possess a peculiar feature in the fashioning of the handle (holes for suspension) as well as flint inserts, which are small flakes with initial use polish on some of them (Gurova 2016a, figs 6–7). It is difficult to determine if these sickles were used in harvesting due to the weak microwear traces. In any case, their appearance and utility seem inferior to those of the Early Neolithic. According to V. Nikolov, groups of migrants from the Karanovo III–IV cultural milieu in Thrace travelled to the northeast and founded the settlement of Provadia–Solnitsata. The remains of this occupation phase represent the lowermost and earliest layer of the tell's stratigraphic sequence (Nikolov 2012). There are two plausible scenarios: (i) migrant Thracian groups brought with them sickles from the Karanovo background (Early Neolithic types or their later replicas) and used these tools in their new habitat (Late Neolithic preserved sickles from secure contexts are still not known from Thrace itself); (ii) migrants from Thrace retained the knowledge of the Early Neolithic Karanovo-type sickle (known for their efficiency) and adapted their manufacture to the local conditions at Provadia–Solnitsata. This would explain the stylistic similarities and the 'innovations' (in the sense of a drastic decline) in the selection and arrangement of flint inserts. Contrary to observations made on Mediterranean assemblages with sickle inserts, which reveal a transformation from diagonal polish (insertion) to parallel hafted inserts (Mazzucco et al. 2020), no change in the hafting of sickle elements, and therefore in harvesting technique, is observed among Bulgarian Neolithic assemblages.

The occurrence of the sickle insert component among the used artefacts from the Case studies presented is shown in fig. 151, below.

What should be stressed is the presence of sickle inserts in all assemblages, despite their regional and other peculiarities.

Closely related to the sickle inserts are the *tribulum* (threshing sledge) inserts. The problem

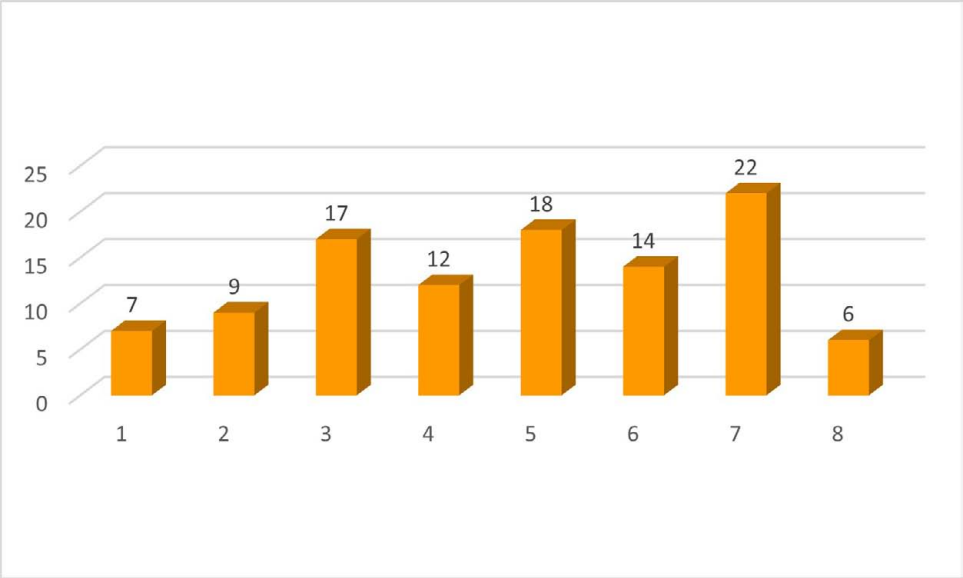


Fig. 151. Sickle insert frequency per site presented as case studies

of comparing cereal polish between these two types of agricultural elements has been extensively discussed in the specialized literature. I contributed to this challenging discourse with several publications, among which the most important are Gurova (2013; 2014c). I recorded three examples of flint artefacts from a Late Neolithic context with a typical (for *tribulum* inserts) microwear complex – two from the Drama–Gerena site and one from Tell Karanovo, trench O19, Karanovo III period/culture (Gurova 2002a, Beil. IX.5.1; 2019, fig. 9). My use-wear (functional) interpretation was correct, but I considered these artefacts rather more anecdotal than intrinsic to the Late Neolithic. A recent paper identified a small series of *tribulum* inserts from the Early and Middle Neolithic strata at four Greek sites, dating to the last centuries of the 7th millennium and the first centuries of the 6th millennium BC. The inserts were identified based on their microwear and on meticulous confocal microscopy. The morphometric characteristics of the *tribulum* inserts resemble some of the sickle inserts found at the sites under study (Mazzucco et al., 2024, fig. 3). While not disputing the authors' results, I remain sceptical about identifying *tribulum* inserts among cereal working toolkits, due to their scarcity. Expectedly, *tribulum* inserts should far outnumber sickle inserts. Moreover, experimental sickles have never been used for long enough to produce the abrasion aspect of cereal polishing (cf. Rosen et al. 2014). I will only be convinced of the correct interpretation of Neolithic *tribulum* inserts (in Bulgaria and Greece) when further research reveals a substantial series of unequivocal *tribulum* inserts.

The second group of artefacts to be presented briefly here are the geometric microliths, which occur in both Early and Late Neolithic assemblages and are thought to have served as transverse arrowheads, given the lack of typical pointed projectile tips in the tool repertoire. There is a dichotomy in the functional connotation of the geometric microliths: on the one hand, it is anticipated that they were used as projectile points (transverse arrowheads or barbs of composite projectiles), but on the other hand, they often reveal traces of different functions, such as sickle inserts and/or knife elements for cutting various materials. Apart from the distinct complex of MLIT (microlinear impact traces), which is diagnostic of projectile point utilization, it is equally possible that this mode of use would leave no microtraces at all. This conclusion has been reached after decades of experimental work with replicas of various kinds of hunting

weapons. It is sufficient to cite one of the first experimental works (Odell, Cowan, 1986) and one of the last (Marko et al. 2025).

From the Early Neolithic microlith series, I analysed the examples from Kovachevo and Dzhulyunitsa. Detectable use-wear traces were recorded only on the microliths from Kovachevo: two used for Si-rich plant treatment and five microliths possessing stigmata of use as projectile points (transverse arrowheads). These microfeatures could be included in the MLIT complex, combining particular fractures, burin spalls, microscarring (spin-off) on lateral edges, and linear striation bands (fig. 33.1).

The Late Neolithic microliths from Tell Karanovo and the sites of Drama Gerena, Dryanovo tell, Harmanli, and Sarnevo were analysed with the following results: one trapeze from Karanovo III–IV was used as a sickle insert; one segment from Harmanli with MLIT traces; five trapezes from Sarnevo showed transverse arrowhead fracture and spin-off scarring, and one trapeze was used as a sickle insert. The site of Drama–Gerena, which yielded 24 microliths, provided 15 tools with utilization traces: 12 microliths can be directly related to projectile point use, 7 as transverse arrowheads and 5 as lateral barbs. Three single functions were attested: an element of a composite meat knife, an element of a plant-processing knife, and a sickle element (fig. 51.1). As mentioned above, the geometric microliths from Bulgarian Neolithic strata require more attention, taking into consideration the numerous publications with high-quality of experiments in shooting arrowheads equipped with microliths, and very instructive descriptions and illustrations of the hafting modes and utilization traces of the microliths.

In summary, the following general observations on the utilization of artefacts can be offered:

- typical Balkan flint formal tools (blades with bilateral steep retouch) suggest several steps in their functional transformation: i) starting with sickle inserts as virgin blades, followed by reverse and resharpening for the same function (from there some relict cereal polish along the rejuvenated lateral edges) and finally (after accumulation of various microwear stigmata and dull edges) – discard; ii) another biography cycle recorded is the deliberate retouching and use for hide and/or wood as a composite tool – the so-called ‘rukan’ with an arched handle and a blade, axially inserted in the centre. This instrument is very efficient for scraping hide and wood[2], and its use is recorded among the formal tools from Tells Azmak and Karanovo (Gurova, Gatsov 2000, fig. 3.1–4). Many of the formal tools, which by resharpening became very narrow, reveal relict ambiguous traces with no detectable character;

- most multifunctional tools comprise the variously retouched blades (except those described above). We have, however, kept in mind that part of the retouches have utilitarian origin which, after intentional rejuvenation, gains a dualistic feature and is typically treated as fashioning retouch – from here arise these ‘discrepancies’ between the conventional typological classification and the microscopic observation, correctly described by C. Perlès (Perlès, Papagiannaki 2022, 213);

- even more apparent is the discrepancy between the endscrapers (anticipated to have served for hide scraping) and the fact that most (in the cases I studied) of the Late Neolithic small endscrapers remained unused;

- some operations, such as wood and bone/antler processing, are weakly represented, which is surprising because of the rich osseous industry and the broad application of wood in house-

2 The efficiency of these composite tools has been confirmed in many experimental programmes at the Traceological Laboratory in St. Petersburg, Russia, in one of which I was fortunate to participate.

hold life – some options as alternative toolkits, or some weakness in their traceological detection (my personal approach) should be considered.

The use-wear results unavoidably provoke questions about the correlation between the typological and functional features of the flint artefacts; how can we explain the variety of the typological repertoire *vs* the limited practical application of some of the types, and what could be the tool producers' priorities – intra-and inter-community exchanges, concrete functional needs, or formal representation of raw material supplying restrictions? These questions I formulated years ago are still awaiting satisfactory resolution (Gurova 2006, 161).

2. DISCUSSION AND CONCLUSIONS

Each case study in Part II includes a discussion and a conclusions section, as each case study has both shared and unique characteristics. To compile these discussions/conclusions and present a synopsis of them here is not warranted. I would rather finish with some thoughts that have arisen in my mind during my research and my intention to assimilate the growing body of literature on Neolithization, for ex. ...

Without having any intention to 'invade' the sacred area of the Iron Gates, logically divided scientifically mainly between Serbian and Romanian scholars' backgrounds, a couple of 'rough thoughts' appear in my mind: the first is that the Iron Gates is a unique location in Southeast Europe, where the Mesolithic substratum 'meets' the farmers, but apart from aDNA issues and cultural grouping of the newcomers in the Starčevo complex, there is no clear or detailed scenario wherefrom the Anatolian migrants reached the Iron Gates. At least we know and admit that Starčevo groups were provided with Balkan flint from northern Bulgaria. Another challenging topic is the comparison between the Iron Gates and the eastern Marmara region in northwest Anatolia, where the local Mesolithic Agacli group was present and met later with the "Fikirtepe culture, representing the initial arrival of Neolithic culture in this region, evidently originating from west-central Anatolia in around 6400 BC" (Özdoğan 2011a, 30). These are two peculiar *milieux*, *favourable* to the meeting, transition, and transformation of two different techno-complexes … during the time span of Neolithization. And, taking into account that the process refers to two areas of relatively late Neolithization, the scenario of "peaceful and harmonious convergence of migrant farmers with the local hunter-gatherer fisher communities" is envisageable (Özdoğan 2022, 410).

The second thought is that between these two phenomena lies a large zone of impressive paraphernalia of Neolithic representations – the territory of Bulgaria. Bulgaria, with the famous Karanovo Tell, whose periodization served for decades as a chrono-cultural marker/pillar for the prehistory of Southeast Europe; Bulgaria, with an uncovered, but imposing itself indirectly, pre-Neolithic (Mesolithic) substratum; the place where the white-on-red pottery appeared (perhaps autonomously – see Nikolov 2007) before the "third wave" of the Anatolian Neolithic package advanced into the Balkans; the area which in the Early Neolithic, "exhibits greater crop diversity than is manifested in Southwest Asia and in other regions of the Balkans" (Colledge, Conolly 2017, 30), and exhibits the emblematic Karanovo sickle. Last but not least is Bulgaria, where the importance of Balkan flint is recognized. Many sources have been reliably identified in northern Bulgaria and are associated with some of the most significant Early Neolithic sites. This has led to the (partial) reconstruction of distribution networks (Gurova et al. 2022b; 2025).

There is no doubt that Bulgarian mediation involved demic (group movement and interactions), cultural (artefacts, know-how and skills exchange) and natural (raw materials such as

Balkan flint) factors, all of which played a significant role in the transformative processes in Southeast Europe at the end of the 7th and the beginning of the 6th millennium BC.

But let us recall Özdoğan's concept that the "...neolithization process was a complex phenomenon, so multifarious that no single model would suffice on a supra-regional basis" (Özdoğan 2011a, 31). In this movement, each settled zone may be considered as a 'core' for those further on the way. So there were many moving 'cores' (ibid., 31). My question is, what is the 'core' role of Bulgaria and in which process? I think I found my answer (within others) – it is at least in the domain of Balkan flint supply and distribution from the outcrop clusters in north Bulgaria into the surrounding Meso-Neolithic *oikoumene* in the Balkans at the boundary between the 7th and 6th millennia BC.

What stories did the flint assemblages tell me during my study? I will try to make my narrative as short and instructive as possible. There are two Early Neolithic sites in Bulgaria which, in the current state of knowledge and available chronological dataset, could be seen as the earliest farming establishments – Kovachevo in the Middle Struma Valley and Dzhulyunitsa in north-central Bulgaria, on the small tributary of the Yantra River. As stated clearly in the previous section, Kovachevo undoubtedly relates to one of the earliest migration waves to reach the territory of present-day Bulgaria. Kovachevo demonstrates significant cultural development before and after its incorporation into the Karanovo I cultural complex during Kovachevo periods Ic–Id, when Balkan flint appears at the site. Therefore, Kovachevo played no role in the emergence of the Balkan flint network. However, its eventual role as a 'core' can be seen in its complex interactions with the sites of Pelagonia in northern Greece, and those to the north along the Struma Valley (Grębska-Kulow 2024).

On the other hand, Dzhulyunitsa, with its impressive Balkan flint blade production and fortunate location between the Pleven–Nikopol and Shumen clusters of Balkan flint (or Balkan flint-like) sources is easily envisaged as a 'core' area for distribution of Balkan flint blanks after the supply of flint nodules from the outcrops by groups dealing with the primary acquisition of the flint and its subsequent trade/exchange. Apart from the exceptional flint core (the naviform-like one), there is a series of blades which are metrically suitable for fashioning into formal tools by various kinds of retouch and resharpening. Flint knappers from Dzhulyunitsa clearly possessed the necessary know-how to remove blades successfully. The question is, where did these knappers come from? Not many options could be listed. The closest route geographically is from the Iron Gates region, along the Danube, reaching the high-quality flint source areas, before establishing the Dzhulyunitsa site; another possibility, according to the theory of the sub-Mediterranean-Aegean vegetation zone, is a shift of migrant groups from their northward itinerary toward the north Bulgarian platform (see fig. 3.1). However, in this scenario, the first site inhabitants supposedly immediately undertook expeditions for raw material provisioning. In my view, the best match to the circumstances and the evidence of the pre-Karanovo enclave in north Bulgaria, comprising a cluster of sites (Dzhulyunitsa, Koprivets, Polyanitsa, Orlovets, Samovodene – see fig. 3.1) is the hypothesis of a maritime spread of farming groups from northwest Anatolia (including the Marmara region) along the (now submerged) Black Sea coast, eventually reaching the Ludogorie Plateau (Özdoğan 2006; 2011 a–b). Here I can quote Roodenberg's statement: "The combined outcome of the radiocarbon dates and DNA analyses clearly illustrates that from as early as the middle 7th millennium, northwest Anatolia must no longer be perceived as a cul-de-sac but as a passageway employed by migrating agriculturalists" (Roodenberg 2016, 4). My research on the Ilıpınar and Menteşe flint assemblages led me to presume such a transmission of knapping know-how and sickle style from these sites (Guro-

va 2001; 2006; 2008b; 2012b); let us recall a statement on Ilıpınar and Menteşe assemblages from a previous publication: "...excluding the bullet cores technique for bladelets production, the *chaîne opératoire* for 'normal' blades could easily be used and improved as know-how by the moving enclaves after they reached the favourable (from a raw material point of view) milieu of north-central Bulgaria (Gurova 2012b, 20).

Another possibility is that at Dzhulyunitsa, mostly knappers and/or down-the-line traders arrived to ensure flint production. This option doesn't contradict a virtual scenario of pre-Neolithic/Mesolithic groups deeply involved in the Balkan flint procurement strategy, which was adopted by the 'new' knappers (with still enigmatic origin), mastering evolved core reduction systems and advanced laminar debitage – i.e., practising a quasi-complete Balkan flint *chaîne opératoire*…

Another trajectory of my (more general) thoughts ....

During my long-term research on Neolithic assemblages, I sought to apply a multifaceted approach *through* techno-typological and functional analyses. The former is the oldest, most traditional, and conventional in flint industries research, for revealing their characteristics and making them usable in a comparative (synchronic and diachronic) perspective. For a formal glance at the assemblages, such an approach is workable and even satisfactory/exhaustive. Technological and typological stigmata are relatively well defined and allow for flexible implementation. The vast literature on chipped-stone industries around the world is, and will remain, carried out at this methodological and interpretive level.

A key advantage is to approach assemblages using use-wear analysis, which reveals the functions of the artefacts and allows us to identify particular toolkits and 'lift the curtain' on the real everyday household and subsistence activities practised by the human groups. The functional connotations of the artefacts are not to create a supplementary (often confusing) functional typology, which will inevitably confront the conventional typology based on a series of common features resulting from repetitive retouching/fashioning of blanks and their transformation into typological tools. Knowledge of the functions of artefacts provides a new perspective on the flint/stone implements, thereby gradually improving our understanding of the tools. The functional parameters of an assemblage are not valuable and necessary only as an instrument for palaeoeconomic reconstructions – for this purpose, they could and should go together with all other proxies of the palaeoenvironmental investigation. In cases (such as ours, for ex.) where palaeoenvironmental research is devoid of a solid base and consistency, the functions of artefacts can serve as a trajectory to some human activity in the everyday life of people, and to enrich our knowledge of their efforts to cope with everyday conditions and to sustain their lives – no more, no less. As for the intention to use functional data for detailed palaeoeconomic reconstructions at various scales, this could only be validated if all artefacts from all sites in a microregion were analysed traceologically. Such cases are sporadic (if they exist!), and it is certainly not the case of my research presented here.

My experience nowadays suggests that, in some cases, starting with a simple 'label' in the specialized literature – 'Balkan flint', for example – and attempting to approach it scientifically through relevant analytical procedures can itself become a trajectory for real scientific advancement. In this sense, I think the most important part of my research consists of the analyses, results and relevant interpretations that our team has produced on Balkan flint, converting it from a confusing fiction to a real (and inescapable in passing) factor in the Neolithization debate, thus ending the era of scenarios and paradigms mainly based on pottery. All aspects of the Balkan flint query provoke new questions and open avenues for more specialized study, going far beyond description and outcrop identification. Its network, both before and during Balkan

Neolithization, is crucial. The results of our research over the past decade have provided new evidence on the Neolithization of the eastern Balkans and the vital role played by lithic raw materials (notably Balkan flint) in the spread of farming. Trying not to be repetitive on this topic, I would say that the conceptual significance of our team's results on Balkan flint lies in Neolithization, the pan-European spread of which is clearly illustrated by D. Gronenborn's map, introduced at the beginning of this book (fig. 2). If we focus on the Balkans, then all the Balkan flint issues mentioned above (section 2.3) suggest that **none** of the conventional scenarios and paradigms of the Neolithization of Bulgaria **is** workable without taking into consideration the Balkan flint outcrops and their accessibility to the first Neolithic settlers. The repetition of the Balkan flint 'formal toolkit' over a large territory and its co-occurrence with other distinctive socio-cultural traits in the first half of the 6th millennium cal BC imply the existence of a sophisticated exchange network with a high degree of interaction, elements of which are still invisible, but which requires detailed systematic research.

However, critical questions remain unresolved (Gurova et al. 2025):

- Did all the Balkan flint used in the Early Neolithic of Southeastern Europe originate from the known sources in northern BG? To resolve this question, more geological surveys and studies in neighbouring countries are needed.

- When and how did the Balkan flint exchange network originate?;

- Were there Final Mesolithic populations living along the Lower Danube who already exploited the Balkan flint sources in northern Bulgaria … and did they share that knowledge with the first farmers?;

- Or did the first farmers to reach northern Bulgaria (re)discover the Balkan flint outcrops themselves?;

- From which direction(s) did the first farmers come? Which of the various scenarios (based mainly on 20th-century pottery studies) is best supported by the available radiocarbon data?

- How does Balkan flint acquisition fit within the traditional concept of the Neolithic package (it exists from the beginning of the Karanovo I culture), but which pre-Karanovo population introduced it?

The questions listed above should be kept in mind by Balkan prehistorians, as resolving them will require a collective effort and more rigorous analytical studies of Balkan flint by scholars across all Balkan countries. Steps in this direction are already perceptible in the energetic and enthusiastic activities of scholars in Serbia, including I. Jovanović and M. Brandl. In an ideal scenario, future research would see an extension into other Balkan countries of the analytical approach to flint provenancing that we have pioneered, which inevitably will improve the level of discourse on the Neolithization by significantly advancing our understanding of Early Neolithic exchange networks and social relations in the Balkans east of the Dinaric Alps.

As for the transformative changes in the chipped-stone industries during their long-lasting biographies – despite being treated as very conservative and resilient – these changes are recognizable and should be captured and revealed based on appropriately studied assemblages, the publication of which should transcend simplistic descriptions and offer high-quality analytical results and illustrative material ... and the intention to accumulate existing knowledge and intelligently implement it into everyone's research. Bulgaria is rich in high-quality raw materials that were used in prehistory. Still, the country is much richer in assemblages that contain a variety of these raw materials in multiple configurations, each telling a different story about the people behind them. We must read these stories accurately before incorporating them into our own narratives.

DOCENDO DISCIMUS!

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БАЛКАНСКИ ФЛИНТ И НЕОЛИТНИ КРЕМЪЧНИ АНСАМБЛИ ОТ БЪЛГАРИЯ: МНОГОАСПЕКТЕН ДИАХРОНЕН ОБЗОР

(резюме)

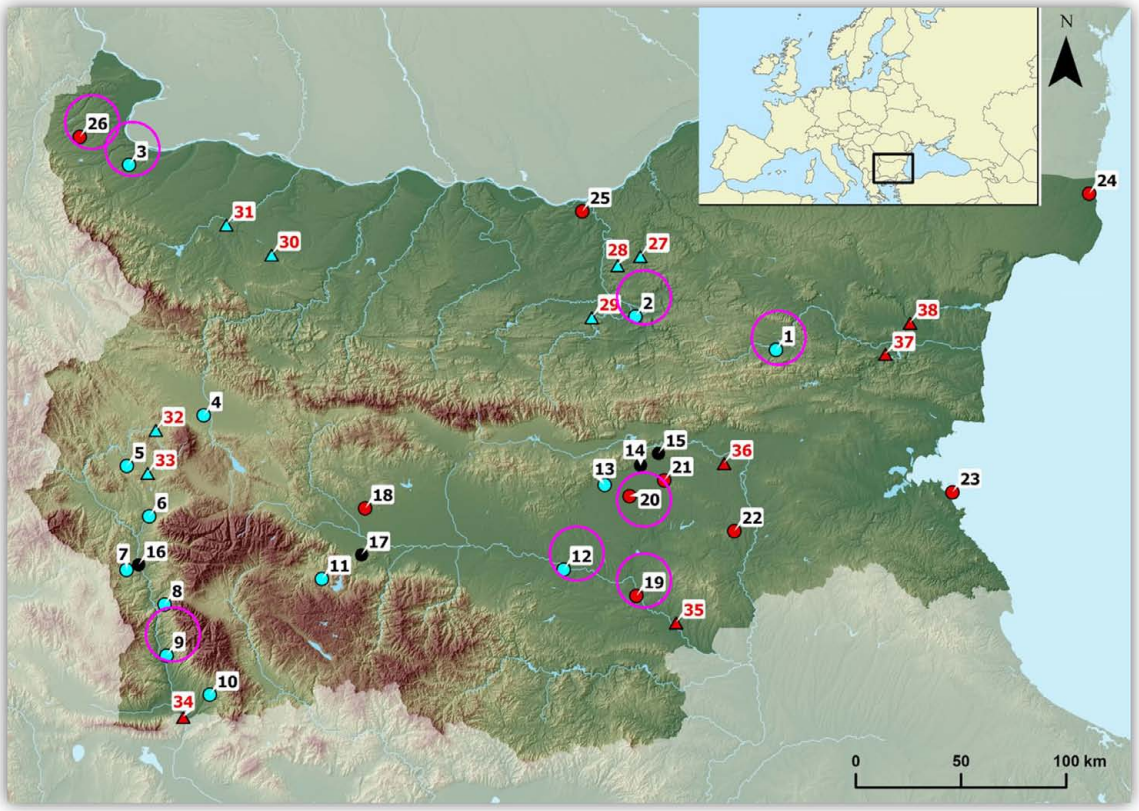
Настоящото резюме се придържа към структурата на монографията: представя основни части от изследването със съответните им заглавия; съдържа препратки към таблиците и фигурите в текста, както и цитирания, съответстващи на библиографския списък.

ПРЕДГОВОР

Българският праисторически „археологически архив“ съдържа огромен обем информация за различни аспекти на неолитния начин на живот. Съвременните мащабни и интензивни спасителни проучвания на множество обекти предоставят все повече данни както за вече познати, така и за нови аспекти от живота на нашите предци през VI хил. пр.Хр. Нашата роля като изследователи е да осмисляме новите гносеологични предизвикателства, основавайки се на стабилен емпиричен и теоретичен корпус от знания, като ги приемаме, отхвърляме или ревизираме по аргументиран и интелигентен начин, когато това е възможно.

Целта ми при обобщаването на аналитичните резултати от почти три десетилетия изследвания, фокусирани върху холоценските кремъчни ансамбли, произтича от убеждението, че е натрупана достатъчно нова информация и знание върху нея, които следва да бъдат споделени. В продължение на десетилетия в българската специализирана литература кремъчните ансамбли са били разглеждани като по-слабо информативни в сравнение с керамичното стилово разнообразие и като по-малко значими спрямо други „социални параметри“ в доминиращия дискурс за неолитизацията.

В хода на изследванията си имах възможност да проуча повече от четиридесет неолитни кремъчни ансамбъла от селища, идентифицирани чрез теренни издирвания, редовни археологически разкопки и спасителни проучвания. По-голямата част от тези комплекси са разгледани в настоящия текст и са представени на приложената карта. Наред с тях са споменати и други комплекси, използвани в коментарите ми и в сравнителна перспектива с разгледаните по-подробно избрани представителни примери (case studies) (карта). Общ преглед на неолитните кремъчни ансамбли от територията на България е представен в Част I на изследването, където те са оценени и интерпретирани в концептуален и контекстуален план. В Част II осем обекта са представени в детайли като примери на проучване, следвайки утвърдена структурна схема. Аргументите за подбора на тези обекти са изложени във въведението към Част II. Финалната Част III предлага диахронен преглед



Карта на България с неолитните селища, използвани текста: 1. Вървица; 2. Джулюница; 3. Ярловица; 4. Слатина–София; 5. Неговановци; 6. Джерман; 7. Дренково; 8. Брежани; 9. Илинденци; 10. Ковачево; 11. Ракитово; 12. Ябълково; 13. Азмак; 14. Карановo; 15. Мусовица; 16. Българчево; 17. Капитан Димитриево; 18. Априлци; 19. Харманли; 20. Сърнево; 21. Езеро (Дрянова могила) 22. Драма–Герена; 23. Созопол; 24. Дуранкулак; 25. Таш Баир; 26. Бранковци; 27. Копривец; 28. Орловец; 29. Плочите–Самоводене; 30. Оходен; 31. Градешница; 32. Перник; 33. Гълъбник; 34. Тополница; 35. Любимец–Дана бунар 2; 36. Хаджидимитрово; 37. Усое; 38. Провадия–Солницата. ***Легенда****: син кръг – раннонеолитно селище; черен кръг – ранно- и среднонеолитно селище; червен кръг – късноеолитно селище; кръг – ансамбъл, проучен от автора; триъгълник – ансамбъл, ползван по публикации. Обектите, представени като примери (case studies), са с цикламено обрамчване*

на ансамблите, съсредоточен върху ключови въпроси, свързани с тяхната многоаспектна интерпретация и включва също дискусия, заключения и перспективи за бъдещи изследвания.

Използваните изследователски методи са достатъчно ясно и подробно представени в мои предходни публикации (включително съвместни разработки) и тук са само накратко споменати в съответните части на текста. Моето разбиране за необходимото качество на една съвременна научна публикация, посветена на праисторическите кремъчни индустрии като цяло, включва няколко ключови (задължителни) изисквания: висококачествени цветни изображения; прецизни рисунки на артефакти; мултидисциплинарни анализи и резултати; интерпретации, съответстващи на археологическите данни; както и достатъчно изчерпателен референтен апарат (библиографски списък). Настоящата монография едва ли е оптимална, но поне представлява сериозна заявка за създаване на стойностно научно изследване.

ЧАСТ I – ОБЩ ПРЕГЛЕД

1. КУЛТУРНО-ХРОНОЛОГИЧНА РАМКА НА НЕОЛИТА И СВИДЕТЕЛСТВА ЗА „РЕГИОНАЛНА“ НЕОЛИТИЗАЦИЯ

Абсолютната хронология, определена чрез радиовъглеродно датиране (за предпочитане чрез солидни серии от дати), е от ключово значение за ситуирането и осмислянето на праисторическите събития и процеси в надеждна времева рамка, както и за реконструирането на тяхното развитие, динамика и еволюция *versus* застой и забавяне. Хронологичната рамка на неолита в България е представена въз основа на различни източници. Въпреки привидните разминавания между хронологичните граници и периоди в отделни публикации, считам, че предложената културно-хронологична схема е необходима като общ времеви контекст за всички културни процеси и събития, разглеждани в настоящото изследване, тъй като в текста има многобройни препратки към датировки и възприети археологически култури.

Първа е т.нар. конвенционална хронология, публикувана преди десетилетия. Макар че тя не е актуализирана, към момента не съществува алтернативна общовалидна хронологична схема. Следва да се подчертае, че не са правени калибрационни корекции или допълнителни байесови интерпретационни модели. Всички дати са заети от публикуваните трудове на цитираните автори и не винаги съдържат оригинални BP дати. Те са представени тук с цел улесняване на времевата контекстуализация на основните разисквани събития:

НЕОЛИТ: фаза	**Хронологичен обхват (cal BC)**
Ранно-керамичен	6300/6200–6000/5900
Ранен	6000/5900–5500/5450 (classical)
Среден	5500/5450–5200/5150
Късен	5200/5150–4900/4850 (Boyadziev 1995)

Традиционното културно-хронологично деление на неолитния период се основава на стратиграфската последователност на Карановската селищна могила, като C^{14} датите за част от секвенцията предполагат следната схема:

– Караново I – 6000–5750 cal BC;

– Караново II – 5750–5500 cal BC;

– Караново III – 5500–5280 cal BC (Görsdorf 1997);

– Караново IV – 5220–5060/4910–4780 cal BC (Thissen, Reingruber 2017).

Към настоящия момент са известни четири обекта с по-ранни от Карановската секвенция дати за началото на неолита – Ковачево, Гълъбник и Азмак в Южна България, както и Джулюница в Северна България – които са с различна интерпретативна стойност в неолитизационния дискурс.

РАЗПРОСТРАНЕНИЕ НА НЕОЛИТА: ИЗБРАНИ МОДЕЛИ И ХРОНОЛОГИЧЕН ОБХВАТ (фиг. 2–3)

Моят интерес към проблема за неолитизацията не предполага навлизане в детайлите на нестихващия и разрастващ се неолитизационен дебат, а търсене на удовлетворителен обяснителен модел за разпространението на неолита на Балканите, и по-специално в България, който да не противоречи на радиовъглеродните дати, на емпиричната база

данни, анализи и интерпретации на съответните обекти, както и да е в съзвучие с проблемите, поставени от кремъчните ансамблии, и особено с въпросите, повдигнати от изследванията на балканския флинт.

Такъв модел е предложен от Р. Краус (и колектив) и акцентира върху бързото разпространение на ранното земеделие от Егейския регион към Балканите, следвайки трасето на субсредиземноморско-егейската (SMA) вегетационна зона и в контекста на флуктуациите по време на климатичното събитие преди 8.2 ka (Krauss 2023; Krauss et al. 2017). Учудващо е, че въпреки географската близост на Тракия до Анатолия, в този регион липсват обекти от най-ранната фаза на неолита извън зоната северно от Мраморно море. Лесният по презумпция маршрут от Северозападна Анатолия се разглежда като проблематичен поради късното усядане на неолитно население в Тракия (според наличните данни). Следва да се отбележи, че това твърдение, основано на археологически свидетелства, не противоречи на хипотезата за придвижване на север по Черноморското крайбрежие с основаване на селища, които днес са под морското равнище. Дискурсът за неолитизацията неизбежно засяга въпроса за преднеолитните и предкарановските периоди, които като научен проблем са все още неоднозначно интерпретирани в специализираната литература. Моето виждане за бъдещи изследвания, които биха допринесли за изясняване на този проблем, е формулирано в края на настоящия раздел.

2. КРЕМЪЧНАТА ИНДУСТРИЯ КАТО ФАКТОР В НЕОЛИТИЗАЦИЯТА

РАННОНЕОЛИТНИ КРЕМЪЧНИ АНСАМБЛИ: ПРЕДПОСТАВКИ И ВЪЗНИКВАНЕ (фиг. 4)

Появата на неолитните кремъчни ансамбли в България съвпада с най-ранните свидетелства за неолитния начин на живот и с други компоненти от вариативния и гъвкав „неолитен пакет“. Множество по-ранни публикации, посветени на най-ранните кремъчни индустрии, подчертават тяхната поява в рамките на вече напълно оформени неолитни контексти, без наличието на ясно проследима връзка с предполагаем преднеолитен субстрат. Въпреки целенасочените издирвания на мезолитни обекти в България, осъществени от Групата за палеолитни изследвания през 70-те и 80-те години на XX век, практическите резултати остават отрицателни. Въпреки това в редица свои публикации И. Гацов неведнъж поставя проблема за „несъществуващия“ мезолит в България. Трябва да се отбележи в тази връзка съществуването на клъстер обекти до Черноморското крайбрежие (в района на Варна), наречени Побитите камъни (Дикилиташ), където по повърхността са регистрирани множество кремъчни ансамбли от различни хронологични периоди. Въпреки изкушението част от тези находки да бъдат отнесени към мезолитен технокомплекс, липсват убедителни аргументи в подкрепа на подобна интерпретация. Освен това скорошните изследвания върху къснонеолитни комплекси показват, че ядрата за пластинки и геометричните микролити не могат със сигурност да бъдат отнесени към преднеолитни периоди. Следователно част от колекцията от Дикилиташ може основателно да бъде свързана с къснонеолитната индустрия/технокомплекс.

МЕЗОЛИТ: НАЛИЧЕН ИЛИ ОТСЪСТВАЩ … И НЕОЛИТИЗАЦИЯТА

Проблемът с „липсващия“ мезолит в българската праисторическа секвенция беше разгледан от настоящия автор и К. Бонсал в публикация, която получи силен отзвук в научната общност, занимаваща се с мезолита (Gurova & Bonsall 2014b). Водещият аргумент в тази статия се основава на убеждението, че „липсата на доказателства не е доказателство за

липса“. Беше заявено, че теоретично, например „извън границите на емпирично обоснованата хипотеза“, рибарски селища или малки селищни единици, подобни на тези в Железни врата, най-вероятно са съществували по българския участък на Долния Дунав, както и в защитени заливи, лагуни и речни устия по Черноморското крайбрежие. И ако искаме сериозно да търсим следите от преднеолитни (късномезолитни) общности и най-ранните новодошли земеделци, трябва да изследваме потопената черноморска крайбрежна равнина и южните брегове на Дунав.

Сред съседните региони с мезолитни останки Железни врата представлява най-забележителният и солидно проучен феномен на емпирично и концептуално- интерпретативно равнище. Богатият репертоар археологически свидетелства и артефакти (погребения, архитектура, керамика, кремъчна индустрия, художествени изображения) са подложени на мултидисциплинарни аналитични изследвания с последваща възможност да се реконструира диахронно еволюцията на материалната култура и социалната организация (въз основа на обекти с мезолитни и неолитни последователности). Тук се фокусирам върху ранните изследвания на кремъчните ансамбли от Лепенски Вир и Власац, тъй като в тях се съдържат множество постулати (някои от които днес вече изглеждат анахронични), белязали дневния ред и приоритетите в изследванията на праисторическите кремъчни индустрии на Балканите (Kozłowski, Kozłowski 1982; 1984).

Критичен въпрос в изследванията на Лепенски Вир е наличието на висококачествен екзотичен или алохтонен флинт/кремък още от началото на секвенцията. Този кремък, наричан балкански флинт (BF), показва драстично увеличение след контакта на местните ловци-събиратели с навлизащите раннонеолитни общности на културата Старчево. В рамките на традиционно утвърдените раннонеолитни кремъчни индустрии BF впоследствие е интерпретиран като нова суровина със значими последици за производствена верига (*chaîne opératoir*e) в неолитното кремъчното производство. В тази си роля BF представлява важен потенциален „филтър“ за разпознаване на взаимодействията между традиционните ловци-събиратели и новодошлите в региона на Железни врата земеделци (Bogosavljević-Petrović, Starović 2016).

Що се отнася до българските земи, които по дефиниция са били третирани като лишени от преднеолитен субстрат, основните и все още конвенционални сценарии за неолитизация предполагат вътрешноконтинентално разпространение от Северното Егейско крайбрежие по долините на реките Струма и Вардар, последвано от многопосочно разселване (Николов 1987; Nikolov 2003; Lichardus-Itten 1993; Todorova, Vajsov 1993; Lichardus-Itten et al. 2002, 2006 и др.). Само малцина изследователи (напр. Bailey 2007; Özdoğan 2011b) изглежда не изключват, а предполагат възможността за морско разпространение по (днес потопеното) Черноморско крайбрежие. Всъщност предполагаема миграция на неолитно население по черноморския бряг с последващо проникване във вътрешността по речните коридори – едновременно с движението по долините на Струма и Вардар, започващо от Северното Егейско крайбрежие – би се вписвало по-добре в наличната база данни от ^{14}C дати (вж. Gurova, Bonsall 2014b). Директният път за неолитно разселване от Северозападна Анатолия е предложен от Роденберг, който разглежда района на Мраморно море не като „cul-de-sac“, а като „проход, използван от мигриращи земеделски общности“ (Roodenberg 2016). Спекулативна, но не и априори оборима, е възможността да е съществувал все още енигматичен и неразкрит мезолитен субстрат, който е наследил и продължил функционирането на мрежата за разпространение на балканския флинт, чрез добив и дистрибуция на кремъчни конкреции и артефакти нагоре по течението на Дунав до Лепенски Вир.

Разделът завършва с две скорошни открития, свързани с темата за „липсващия“ мезолит и потенциала на подводните изследвания на морското крайбрежие. R. Krauss публикува три радиовъглеродни дати от своеобразна находка на три еленови рога, депонирани в яма в неолитното селище Оходен. Калибрацията на датите показва LXVII в. пр.Хр. (Krauss 2023, 45). Засега находката се разглежда като късномезолитна структура, несвързана с проучения раннонеолитен хоризонт на обекта, като приоритет за бъдещите изследвания на екипа остава търсенето на контекстуалната рамка на структурата от еленови рога и евентуални доказателства за връзка между мезолитната структура и раннонеолитното обитаване на обекта, датирано като повече от 1000 години по-късно от контекста на структурата (Ганецовски 2009).

Второто откритие все още остава непубликувано. Радиовъглеродни дати, попадащи в LIX в. пр.Хр., произхождат от подводното селище Ропотамо. Съществуващата публикация (Dimitrov et al. 2024) предоставя информация за интересните характеристики на обекта. С нетърпение се очаква предстоящата публикация, която ще съдържа серия от AMS дати и по-сигурна контекстуална интерпретация. Този обект, както и много други, които остават потопени, биха могли (надяваме се) да предложат още по-убедителни доказателства и предизвикателства за много ранни неолитни селища в потопената днес част на Черноморската крайбрежна равнина.

Не на последно място съществуват особено интригуващи генетични данни за наличие на компонент от ловци-събиратели в произхода на индивидите от Малък Преславец (Mathieson et al. 2018, 199) – обект, разглеждан като принадлежащ към ранния неолит (Панайотов и др. 1992), за който обаче съществува само кратка и по-скоро объркваща, отколкото ясна информация относно „хетерогенната“ му кремъчна колекция.

БАЛКАНСКИ ФЛИНТ: НАУЧНО ПРЕДИЗВИКАТЕЛСТВО И ТРАЕКТОРИЯ КЪМ НЕОЛИТИЗАЦИЯТА

КОНСОЛИДИРАНЕ НА ИЗСЛЕДВАНИЯТА ВЪРХУ БАЛКАНСКИЯ ФЛИНТ (фиг. 5–20; табл. 1–3)

Преди повече от десет години публикувах статията „‘Балканският флинт’ – фикция и/или траектория към неолитизацията: свидетелства от България“ (Gurova 2012a). Статията се фокусира върху състоянието на изследванията и знанията за балканския флинт (BF) и върху аспектите, произтичащи от тази проблематика, съотнесени към по-широкия и все по-сложен въпрос за неолитизацията на Източните Балкани. Прочитайки отново тази статия, не мога да не призная, че по-голямата част от научната проблематика за BF е добре представена и реално послужи за отправна точка за последващи дългосрочни и сериозни изследвания, чиито аналитични и концептуални резултати бяха обобщени в наскоро публикуваната статия „Балканският флинт в перспектива: десет години интердисциплинарни изследвания“.

Статията за BF (Gurova 2012a) беше важна, защото консолидира мисли, идеи и тенденции, които стимулираха последващи изследвания върху този тип кремъчна суровина. Проучванията включваха не само идентификация на геологическите източници, но и интегриране на резултатите в дебата за неолитизацията, основаващ се на факта, че BF със сигурност се появява и играе роля в установяването и функционирането на раннонеолитното балканско ойкумене. Сега, когато са налични много съществени резултати, не мога да отрека, че моите предварителни представи/хипотези за произхода на BF и разпростра-

нението му сред известните раннонеолитни обекти, съдържащи негови артефакти, бяха правилни.

Още от самото начало беше ясно, че находищата на BF се намират в Северна България. В същото време Тракийската низина, която е лишена от кремък, конкуриращ BF, представлява най-голямата арена за проява на диагностичните раннонеолитни оръдия от балкански флинт, както, разбира се, и на други елементи на материалната култура през този период. В края на статията са обобщени и коментирани основните сценарии на неолитизацията: а) проникване на земеделието от Северното Егейско крайбрежие по долината на р. Струма – сценарий с най-много поддръжници; б) миграция по долините на Вардар и Морава до Железни врата и по течението на Дунав към Северна България – това разселване предхожда тракийската колонизация от същите групи; в) движение на север от Северозападна Анатолия, проникване по крайбрежието до района на Лудогорието и последващо разселване в западна посока, заобикаляйки вътрешността на България (Gurova 2012, 49–41). Освен маршрута по река Струма, другите два сценария предполагат специфична посредническа роля на обекта Джулюница в процеса на снабдяване и разпространение на балкански флинт (под различни форми) до множество потребители. По време на писането на статията това мое виждане беше по-скоро интуитивно, отколкото аргументирано, но тази работна хипотеза остава валидна и до днес. Въпросът, който поставих в края на статията през 2012 г., обаче остава предизвикателен и нерешен: Кои са били новите майстори на кремъчното производство и откъде са дошли, носейки познания и умения за добиване на представителни пластини от началото на ранния неолит?

ПРОУЧВАНИЯ ЗА ПРОИЗХОДА НА БАЛКАНСКИЯ ФЛИНТ: ИНОВАТИВЕН ИНТЕРДИСЦИПЛИНАРЕН ПОДХОД

Между 2011 и 2023 г. бяха проведени пет полеви проучвания, придружени от поредица комплексни лабораторни анализи. Този иновативен и перспективен подход беше инициран и реализиран с ползотворното сътрудничество на колеги от Геологическия институт на БАН (П. Андреева и Е. Стефанова). Външен член на екипа беше професор К. Бонсал от Университета в Единбург.

През повече от десетилетие практикувахме новаторски подход, довел до значителен напредък в изследванията на каменните суровини в праисторията. Подходът комбинира суровинно опробване и пробонабиране на терен, макро- и микропетрография с геохимичен анализ (LA-ICP-MS) на проби от суровини и кремъчни артефакти. Въз основа на пет систематични теренни издирвания за идентификация и документиране на кремъчни находища бяха селектирани 64 геологически проби за сравнение със 166 артефакта от археологически обекти. Всички етапи от аналитичната процедура – от полевата работа до комбинираните резултати и създаването на база данни – бяха подробно документирани. Резултатите от изследванията ни бяха своевременно публикувани с отворен достъп и представляват солиден корпус от аналитични данни, които могат да се интегрират и използват в бъдещи научни проекти (Andreeva et al. 2014; Gurova et al. 2016; 2021b; 2022a–b; 2024; 2025).

Тук ще представя две от теренните ни издирвания:

- Първото проучване, осъществено в Централна Северна България, беше най-продуктивно и доведе до подробна документация и идентификация на клъстери с находища на балкански флинт в района Плевен–Никопол (Гюрова и др. 2012a–c; Gurova et al. 2016).

Горнокредните варовици, съдържащи кремъци, образуват обширни находища в Северна България (Мизийската платформа и прилежащите ѝ части на Балканския Алпийски Ороген), но само в района на Плевен–Никопол Мизийският кремък (в смисъла на Nachev 2009) е разположен в ненарушени скали. Най-сигурно идентифицираните находища се срещат във варовиците на Горнокредната Мездренска силициево-карбонатна свита. Вторични елувиални, делувиални и алувиални депозити на кремък са се образували вследствие на разрушаването на същите варовици, съдържащи кремъчни конкреции. Въпреки регистрирането на поне едно находище с категорични доказателства за експлоатация по време на Холоцена (находището Жернов, близо до едноименното село), все още не е идентифицирано ателие с характерните белези на обработка на балкански флинт за нуждите на неолитното население.

- Втората област на разпространение на мизийски (по Начев) флинт е в Шуменско, в Североизточна България, където проведохме полеви издирвания. Тук бяха разграничени и описани два нови типа кремък – Шумен I и II. Визуално Шумен I много наподобява BF, но петрографските и геохимическите (LA-ICP-MS) анализи показват различни профили.

Междувременно благодарение на финансиран от НАИМ–БАН проект разширихме суровинната ни колекция с няколко допълнителни образци, за да ги сравним както с наличната база данни за BF, така и с нови 77 артефакта от 10 раннонеолитни обекта. Аналитичната процедура включваше сравнение на новата серия артефакти със суровините от балкански флинт, събрани от всички полеви сезони.

Последните резултати са много информативни и в някои отношения изненадващи. Те демонстрират надеждна методика за свързване и разграничаване както между артефакти и находища, така и между самите артефакти и между отделните суровнни източници – условие за надеждно възстановяване на разпространението на кремъчните суровини. GIS моделирането помага да се идентифицират възможни пътища за разпространение на флинта между находищата и местата на потребление, като разстоянията между тях варират от 23 до 314 km, при условие че разпространението е директно (Gurova et al. 2022b).

Проблемите с BF, споменати по-горе, екстраполирани към дискусията за неолитизацията – аргументи и причинност – показват, че нито един от конвенционалните сценарии и парадигми за неолитизацията на България не е работещ без отчитане и осмисляне на находищата на BF и тяхната достъпност за първите неолитни заселници. Повторяемостта на диагностичните оръдия от балкански флинт на голяма територия и тяхната съвместна поява с други отличителни социо-културни черти в първата половина на VI хил. пр.Хр.. предполагат съществуването на сложна мрежа за обмен с висока степен на взаимодействие, елементи от която са все още невидими, но изискват подробно и систематично изследване.

Първият хипотетичен проблем е липсата на археологически следи за пред-Караново I разпространение на BF от находищата в Северна България към обектите от раннонеолитния културен комплекс на Караново I в Южна България. От друга страна, е възможно да се предположи известен обмен на BF между предкарановски общности около обекта Джулюница и евентуалния предкарановски субстрат в Тракия, за който (поради сериозните речни разливи в Тракия) не се очакват археологически доказателства.

РАЗПРОСТРАНЕНИЕ НА МРЕЖАТА НА БАЛКАНСКИЯ ФЛИНТ: ПРОТИВОВЕС НА ОБМЕНА НА МЕЛОСКИ ОБСИДИАН?

Диагностичните раннонеолитни оръдия от BF (главно ретуширани пластини, често с раз-

лично оформени краища, и елементи от сърп) се срещат в представителни серии сред раннонеолитните комплекси с (бяло)рисувана керамика, характерна за културата Караново I в Тракия, заедно с нейния южно/югозападен вариант (включително Софийската равнина) и обекти в горното и средното течение на долината на Струма.

В този смисъл диагностичните оръдия от BF са и трябва да се разглеждат като културен маркер на комплекса Караново I. Те продължават да бъдат доминантни по време на културата Караново II (оттук честото позоваване на Караново I–II културна общност/*koiné*), визирайки пространствено-темпоралната среда на проява на диагностичните оръдия от балкански флинт, а не за специфики на керамичното развитие. Тези кремъчни маркери запазват присъствието си в къснонеолитна секвенция по време на Караново III и IV като закъсняла (ретардираща) или остатъчна (реминисцентна) форма. През късния неолит те губят диагностичния си характер, но въз основа на качеството им продължават да бъдат преоформяни и преизползвани както с утилитарна, така и с възможна символична цел.

Както стана ясно по-горе, диагностични оръдия sensu stricto се отнасят към културната общност Караново I–II. От друга страна балканският флинт като суровина и неговите производни продукти имат много по-широко разпространение. Те са изобилни сред кремъчните ансамбли в Северна България, което е логично и очаквано поради разположението на находищата в района Плевен–Никопол и в малък клъстер около Шумен, откъдето произхожда типът кремък Шумен I, който, както бе споменато, е макроскопичен еквивалент на типичния BF.

Раннонеолитните обекти с артефакти от балкански флинт сред своите кремъчни ансамбли са широко разпространени в Югоизточна Европа: Сърбия (включително Войводина), Северна Македония, Южна Румъния, Карпатския басейн, обекти в турска Тракия и един обект на остров Гьокчеада (Имброс).

Системата за разпространение на BF е била една от двете основни мрежи за обмен на суровини в Югоизточна Европа (заедно с разпространението на обсидиан от Мелос) по време на ранния неолит, като и двете мрежи са симптоматични за сфери на взаимодействие, които вероятно са играли съществена роля в неолитизацията на съответните региони.

Един от ключовите въпроси е: кои български обекти са участвали в мрежата и каква е била тяхната роля в обмена вътре и между общностите? Този въпрос неизбежно поставя следващия – за работилниците за добив на суровини и производство на артефакти от BF. От идентифицираните находища, най-обещаващите като работилници са Жернов, Муселиево и Али Коч Баба Теке – всички в клъстера находища в района Плевен–Никопол, експлоатиращи кремъчни находища от Горнокредната Мездренска силициево-карбонатна свита. Що се отнася до работилниците за кремъчни артефакти, регистрирани в раннонеолитни селища, единственият обект с производствена зона/ателие е Слатина, но са документирани само три ядра. За съжаление повечето артефакти са били силно увредени от термични въздействия по време на изгарянето на „голямата къща“. Други възможности за производство на изделия от BF на място са разгледани чрез примерите с обекти 1–3 (в Част II) и в раздела „Дискусия“ на основния текст.

В тази ситуация с два ключови неолитни обекта, отнасящи се към края на VII хил. пр.Хр. – Джулюница (в Централна Северна България) и Ковачево (в долината на Средна Струма в югозападния край на страната), неоспорим приоритет в процеса на първоначално усвояване и развитие на мрежата за доставка и разпространение на BF има Джулюни-

ца с нейния предкарановски субстрат и модели на материалната култура.

Ковачево, което е една от първите „колонии“ на най-ранните мигриращи фермери от Анатолия (директно или чрез вълни от Северното Егейско крайбрежие), не показва присъствие на BF преди фазите Ic и 1d, когато обектът е интегриран в културния кръг на Караново I. Вече съм изразила хипотезата си за ключовата роля на Джулюница в системата/мрежата за добив и разпространение на балкански флинт с пълно съзнание за предварителния характер на предположенията ми.

Най-ранното и сигурно датирано присъствие на BF в раннонеолитен контекст е в селището Джулюница в Северна България, където артефакти от BF се срещат от самото начало на секвенцията, датиращо преди 6000 г.пр.Хр.

Накрая трябва да се отбележи, че предходният раздел се основава на дългогодишни интердисциплинарни изследвания върху BF (с находища в Централна Северна България), акцентиращи върху неговото възникване и масовото му разпространение на голяма територия, както и върху съвместната му поява с други отличителни социо-културни характеристики през първата половина на VI хил. пр.Хр. Това предполага съществуването на сложна мрежа за обмен с висока степен на взаимодействие, като се предполага, че нито един от конвенционалните сценарии и парадигми на неолитизацията на България не е приложим без (пре)осмисляне на факта за локализацията на кремъчните находища и тяхното откриване и разработване от първите неолитни заселници или, алтернативно, осигуряването им на достъп до вече съществуващи и функциониращи преднеолитни мрежи за обмен на BF.

3. РЕГИОНАЛНА СПЕЦИФИКА СРЕЩУ УНИФИКАЦИЯ В РАННОНЕОЛИТНИТЕ КРЕМЪЧНИ ИНДУСТРИИ

РАННОНЕОЛИТНИТЕ АНСАМБЛИ НА КУЛТУРНАТА ОБЩНОСТ КАРАНОВО I (фиг. 21–40)

Този раздел се базира на данни от 17 раннонеолитни кремъчни ансамбъла (включително четири с къснонеолитни пластове), изследвани в продължение на дълъг период от време (виж картата по-горе). Тези ансамбли са изучавани чрез различни аналитични подходи, концептуални рамки и стратегии за публикуване. Следните обекти са проучени от мен и впоследствие публикувани: Караново (Gurova 1997; 2002a), Азмак (частично – Gatsov, Gurova 2001), Ябълково (Gurova 2014a, пример 5 в Част II), Слатина, Ковачево и Ракитово (Gurova 2011b; 2012b). Представителна извадка от тези обекти беше използвана за дефиниране на диагностичните раннонеолитни оръдия от балкански флинт и за аргументиране на тяхната роля в неолитизационния дебат (Gurova 2008a; 2009; 2018b; Gurova & Bonsall 2014a). Част от тези изследвания са публикувани в кратка форма в серията *Археологически открития и разкопки*. По-нови изследвания, както и анализите на някои от най-важните обекти, се представят за първи път тук като представителни примери в Част II (Върбица, Джулюница, Ярловица и Илинденци). Кумулативните ми наблюдения върху всички изучени ансамбли позволяват очертаването на основните характеристики на раннонеолитните кремъчни индустрии и определянето на белези на регулярност и еднообразие спрямо уникалност и специфичност. Всички обекти, разгледани тук, са част (някои като периферни компоненти) от общността на културата Караново I, интерпретирана чрез динамичния модел на културните процеси в Тракия (Nikolov 2004). В контекста на кремъчните ансамбли тази общност/културен кръг/*koiné* включва и културата Караново II в нейния пространствено-времеви диапазон. Отделна група, представяща югозападния

вариант на културата Караново I, се формира от обектите по долината на река Струма – предимно в средното, а в по-малка степен в горното течение, включително Ковачево, Илинденци, Брежани, Дренково, Българчево, Джерман и Негованци. Това изложение представя кратък коментар за Негованци, за да се компенсира липсата на лични наблюдения върху недостъпния кремъчен материал от Гълъбник. Другите обекти са по-близо до епицентъра на класическата култура Караново I – Ракитово, Капитан Димитриево и Ябълково. Селищните могили Караново и Азмак са изучавани на ранния етап от моите неолитни проучвания, преди изкристализирането на специфичния фокус върху балканския флинт (BF). Поради това тези ансамбли не могат да бъдат директно сравнявани методологично с по-скоро изучените колекции. Въпреки това те остават сред най-представителните примери за диагностични раннонеолитни оръдия от BF и често се използват като референтни, особено при дискусиите за т.нар. „макропластини“.

Раннонеолитните обекти на Северна България – Върбица, Джулюница и Ярловица – са представени като примери №№1–3 в Част II. За да се изясни допълнително ролята на кремъчните индустрии в социално-културните процеси през първата половина на VI хил. пр.Хр., ансамблите, проучени от автора, се представят тук по-кохерентно, с особен акцент върху все още непубликуваните или новоанализираните материали и в компаративна проекция спрямо раннонеолитни ансамбли, интерпретирани от други изследователи.

На базата на систематичното изучаване на многобройни кремъчни ансамбли от ключови раннонеолитни обекти южно от Стара планина – включително селищните могили Караново, Азмак и Капитан Димитриево, както и „равнинните“ обекти Ковачево, Ябълково, Ракитово и Слатина – съм аргументирала обособяването на отделна категория *диагностични оръдия или комплекти оръдия, направени* неизменно от балкански флинт (Gurova 2008a). Терминът за такъв тип характерни оръдия е широко използван в съвременните изследвания и по дефиницията на Андрефски това са оръдия, които притежават една или повече от следните характеристики: стандартизирана форма, повишена (технологична) сложност на изработка, възможност за преоформяне и повторна употреба, използване на специални суровини, предварителна подготовка, очаквано предназначение и възможност за транспортиране (Andrefsky 1994, 22).

В последващите мои изследвания на други (ранно)неолитни ансамбли от различни региони концепцията за диагностичните оръдия е използвана като основен дискриминативен критерий сред всички аналитични и интерпретативни компоненти. Така те представляват надежден инструмент за синхронно и диахронно сравнение на кремъчните ансамбли.

Диагностичните оръдия включват предимно пластини от визуално еднороден жълтеникаво-кафяво-сивкав с бели включения балкански флинт, с непрекъснати (понякога частични) полустръмни до стръмни и високи ретуши на единия или двата странични ръба. Краищата може да са заострени (тип перфоратори) или закръглени (тип стъргалки). Неизменен компонент на диагностичните оръдия са и елементите от сърп от известния Карановски тип. От технологична гледна точка индустрията показва систематично използване на индиректен удар (техника на отделяне с посредник), а характерният стръмен ретуш е осъществен чрез натиск с органичен ретушор. Важно е да се отбележи, че нито ядра, нито отломъци и отпадъци от подготовката им са документирани сред артефактите, поради което производствената верига (*chaîne opératoire)* остава фрагментирана и не подлежи на цялостно възстановяване.

За отбелязване е, че диагностични за Караново I–II оръдия от балкански флинт са идентифицирани и документирани сред ансамбли, принадлежащи към различни култур-

ни групи в надрегионалния технокомплекс Караново I–Старчево–Криш–Кьорош, където се срещат като завършени оръдия или като общо използвани артефакти от BF.

Наличието на диагностични оръдия от гореописания тип е белег за афилиация към културното *koiné* Караново I–II. Тези оръдия са най-многобройни и представителни в селищните могили Караново и Азмак, където доминират, следвани от Ябълково, Ракитово, Слатина, Ковачево, Илинденци и други обекти (Gurova 2008; 2011a; 2012b; 2014b). Характерните оръдия се появяват в различни пропорции и на различни етапи от раннонеолитната секвенция, което е особено добре проследимо сред обектите по средното течение на Струма. В могилите Азмак и Караново те са доминиращи и технико-типологически напълно завършени още от началото на неолитната секвенция.

Освен диагностичните оръдия, всички раннонеолитни ансамбли от обектите в Южна България съдържат и белези на експедиентно/опортюнистично производство на полуфабрикати (отломъци и пластини) и типологически оръдия от локални (кремъчни) суровини. В този смисъл наличието на диагностични оръдия от балкански флинт въвежда елемент на еднообразие, докато експедиентната (*ad hoc*) продукция, основана на локални суровини добавя специфика и регионално разнообразие в раннонеолитните кремъчни индустрии. Видът и достъпността на тези местни суровини варират значително между отделните региони.

Регионалното разпределение на раннонеолитните кремъчни ансамбли, свързани с културния кръг на Караново I, е представено в следната последователност: селища в долината на Струма, в Софийското поле и в Тракийската низина. Клъстерът обекти от долината на Струма включва селищата северно от Ковачево, а именно Илинденци, Брежани, Дренково и Българчево. Систематичните изследвания на М. Гребска-Кулов са съсредоточени върху средното течение на Струма, предоставяйки изчерпателен концептуален и диахронен преглед на ранно- и среднонеолитното заселване (Grębska-Kulow 2017; 2024). Горното течение на Струма е представено от обектите Джерман, Гълъбник (според изследванията на И. Гацов) и Негованци.

Сумарно и синтезирано ансамблите от Струма показват общи характеристики на кремъчните ансамбли от Ковачево до Негованци, най-важната от които е наличието на артефакти и диагностични оръдия от балкански флинт – типично ретуширани пластини и елементи от сърп. Хронологично този белег на кремъчната индустрия за Ковачево са свързва с фаза Ic (ок. 5900 BC според Grębska-Kulow 2024), докато в северните обекти (Гълъбник и Негованци) се появява приблизително столетие по-рано, което подкрепя хипотезата, че „пакетът“, съдържащ балкански флинт и неговите деривати, е внесен от север, чрез или заобикаляйки работилницата в Слатина–София.

Обектите от Софийското поле и Тракийската низина, коментирани тук, включват Слатина, Ракитово, Ябълково, могилите Караново и Азмак. Характеристиките на тези ансамбли включват наличието на значителни серии диагностични оръдия от балкански флинт – най-много в селищната могила Азмак, както и в Караново и Ябълково – и интензивната им употреба и трансформация. Всички обекти демонстрират и белези на експедиентна продукция, базирана на местни и регионално достъпни суровини, и свързана основно с продуктите на дебитажа – отломъци и фрагменти, по-рядко пластини. Очаквано в ансамблите от споменатите селища се откриват напълно еволюирали сърпове Карановски тип, чиито елементи (преобладаващо ретуширани и неретуширани пластини от балкански флинт) се характеризират с интензивна и продължителна употреба, многократно преоформяне и реутилизация.

РАННОНЕОЛИТНИ ОБЕКТИ В СЕВЕРНА БЪЛГАРИЯ (фиг. 41–43)

Раннонеолитните кремъчни ансамбли от обекти в Северна България се различават значително от тези в културния кръг Караново I–II, които съдържат типични диагностични оръдия от балкански флинт. Раннонеолитната кремъчна индустрия в Северна България се характеризира с изобилие на артефакти от BF, включително продукти на дабитажа, типологически оръдия и ядра. Въпреки това, производствената верига (*chaîne opératoire*) на BF е фрагментарна, а диагностичните оръдия от BF са от минимално представени до напълно отсъстващи. Най-интересните и ключови раннонеолитни обекти, проучени от мен, са Върбица (Североизточна България), Джулюница (Централна Северна България) и Ярловица (Северозападна България), които са представени като примери №№1–3 в Част II на монографията. Други обекти, изследвани от различни учени и коментирани в този раздел, включват Копривец, Оходен, Градешница, Овчарово–Гората и Орловец.

Следвайки сценария на Krauss и колектив (Krauss et al. (2017) относно навлизането на неолитизацията по трасето на субсредиземноморско-егейската биогеографска зона по време на климатичното събитие от 8.2 ka, Krauss поставя обекта Джулюница в центъра на предкарановски анклав/клъстер в Централна Северна България, твърдейки, че „..раннонеолитното селище Джулюница в момента се оказва ключов обект за определяне на характеристиките на най-ранния неолит на Балканите“ (Krauss 2023, 141). Този обект играе съществена роля в моите почти интуитивни (в миналото) и по-добре аргументирани (сега) мисли и хипотези относно добиването, снабдяването и разпространението на BF като развита и ефективно функционираща мрежа за суровини на Балканите (поне!). Джулюница, с достатъчно контекстуална информация, детайлно проучване, резултати, коментари и обсъждане, е представена в Част II като обект/пример №2.

Като кратко обобщение на данните от селищата в Северна България може да се формулира следното:

а) В ансамблите от Върбица и тези от Джулюница, Ярловица и Оходен присъствието на диагностични оръдия от BF е минимално в сравнение с ансамблите от културния кръг Караново I–II.

б) Има обекти, свидетелстващи за производствена верига, базирана на локални суровини и производство на отломъци (Копривец, Оходен). Регистрирана е и непълна производствена верига на BF в Джулюница и Ярловица като в Джулюница е документирана и обработка на тъмносив с бели включения висококачествен флинт).

в) Продукти от балкански флинт като цяло са регистрирани основно в Ярловица, Джулюница, Върбица и потенциално Оходен. Във Върбица съществуват съвместно артефакти от типичен балкански флинт и такива от макроскопски близкия му тип Шумен I).

г) Находищата на BF *sensu stricto* (клъстер Плевен–Никопол) и *sensu lato* (тип флинт Шумен I с местонаходища в самия Шумен) са пространствено по-близки до Оходен и Върбица. Джулюница и особено Ярловица обаче демонстрират изобилие от BF като резултат от регионално и надрегионално разпространение (измерено от клъстера Никопол – виж Gurova et al. 2022b, Table 2, fig. 15).

д) относно палеостопанската активност, проучванията в Джулюница, Върбица и Ярловица разкриват елементи от сърпове от BF (т.е. диагностични оръдия с конкретната им функционална конотация). Това не бе документирано при моите наблюдения през 2018 г., базирани на пилотни проучвания на двата обекта. Джулюница показва преобладаване на сечива, свързани с обработка на животински продукти. Във Върбица съотношението

между животински продукти и зърнени култури е приблизително еднакво, докато в Ярловица определено преобладават сърповете – т.е. изделията, свързани със земеделския цикъл.

4. КЪСНОНЕОЛИТНИ АНСАМБЛИ

ОБЩИ БЕЛЕЖКИ

Начинът на живот през ранния неолит, включително важната роля на BF в стопанската и домашната дейност, както и в мрежите за разпределение на ресурси и обмен на социални послания и символи, се променя постепенно през втората половина на VI хил. пр.Хр. с настъпването на късния неолит. Това е част от обща и значима промяна в материалната култура и социалната организация на общностите, населявали територията на нашата страна. Наблюдават се промени в разположението на обектите (топография), моделите на селищата, стратегията в строителството и архитектурата, както и в характеристиките на керамичните комплекси (Николов 1998; Nikolov 2004; Тодорова, Вайсов 2003). Значението на различията и многостранните прогресивни промени между ранните и късните неолитни култури е предпоставило разграничаване на т.нар. „ранно-“ и „късноеолитни“ културни блокове с допълнително подразделяне. В Тракия е регистрирано прекъсване между двата блока, а преместването на населението от селищните могили към платата се обяснява с климатични промени и увеличаване на влажността (Тодорова, Вайсов 1993, 125).

Примерите за диахронни изследвания на неолитната материална култура и социална структура са малко, а причините и характерът на широкомащабните трансформационни процеси около 5500 г. пр.Хр. остават неизяснени. Каква е връзката им с кремъчната индустрия?

ПРЕХОД И ТРАНСФОРМАЦИЯ В НЕОЛИТНИТЕ КРЕМЪЧНИ ИНДУСТРИИ (фиг. 44–51)

И. Гацов (1993) представя еволюционните промени в неолитните кремъчни индустрии от Западна България, акцентирайки на технологичната деградация в кремъчната индустрия по време на късния неолит. Важна е констатацията му, че стъргалките стават доминираща типологическа група в късноеолитните ансамбли. По-нататъшни и по-задълбочени проучвания върху трансформацията на кремъчните ансамбли, датирани след ранния неолит, са предоставени в моите публикации с нови данни, идеи, наблюдения и заключения, базирани на диахронен сравнителен анализ на ансамбли от различни типове неолитни селища. Най-общо аргументите за значителна трансформация се свеждат до: а) увеличена роля на локалните суровини (опортюнистично ad hoc производство) и ограничено търсене на балканския флинт – т.е. спад в системата за разпространението му; б) регрес в производството на пластини и прогресивно нарастващ акцент върху производството на продукти на дебитажа (основно отломъци с последващата им трансформация в оръдия на отломъци (главно стъргалки и ретуширани отломъци); в) нарастващо разнообразие на стъргалките (по типологически и морфометрични параметри) с видимо скъсяване на пропорциите и по-голяма вариативност във формата; г) явна микролитизация, представена от малки до микроядра за пластинки и две категории ретуширани артефакти: микростъргалки на отломъци (често полукръгли) и геометрични микролити sensu stricto (трапеци, полумесеци/сегменти и редки атипични форми); д) устойчиво присъствие на редки, но разпознаваеми диагностични за ранния неолит

оръдия от BF, представляващи реминисцентни елементи на кремъчната индустрия.

Промените в кремъчната индустрия по време на късния неолит са регистрирани във всички ансамбли, макар и в различна степен, поради различните модели на селищна и социална структура през разглеждания период. Промените са плавни, с ясни доказателства за континюитет между ранно- и къснонеолитните ансамбли в селищните могили (Караново е типичен пример), където приемствеността и кохерентността са имплицитно заложени. От друга страна, в къснонеолитните ансамбли на новосъздадени и тънкослойни селища кремъчната индустрия е с хетерогенни белези, но с доминиране на диагностичните черти на късния неолит, описани по-горе. Към втората категория се отнасят проучените от мен кремъчни ансамбли от следните обекти: Българчево, Априлци, Езеро (Дряновска могила), Сърнево, Харманли, Созопол, Таш Баир и Бранковци, които са представени накратко или като обособени примери (№№6–8 в Част II) в монографията. Освен тях други интересни ансамбли, изследвани и публикувани от други учени, също са коментирани: Усое, Аклади Чеири и селищна могила Провадия.

Особено внимание съм отделила на геометричните микролити, които се появяват в къснонеолитните секвенции на различни селища. Те са най-многобройни и типологически разнообразни сред всички холоценски геометрични микролити от България като преобладаването на трапеците е за отбелязване. Къснонеолитните ансамбли с микролити са свързани с повсеместните радикални промени в материалната култура след 5500 г. пр.Хр. Микролитизацията на кремъчната индустрия е само един от аспектите на този преход. Геометричните микролити могат да се считат за една от диагностичните прояви в прехода и трансформацията на къснонеолитната кремъчна индустрия. Микролитизацията е явление, провокирано или от адаптивна стратегия към променени екологични условия, или от установяването на нови общности с различни предци и латентни технологични и занаятчийски умения, а е възможна и комбинация от фактори.

ПРОМЕНИ В СНАБДЯВАНЕТО СЪС СУРОВИНИ И ИЗПОЛЗВАНЕТО ИМ

Освен техно-типологическите промени в кремъчната индустрия, друг въпрос, който изисква допълнително изследване, се отнася до промяната в снабдяването и разпределението на суровини (особено на балкански флинт), която се случва в началото на втората половина на VI хил. пр.Хр. След като BF изиграва фундаментално важна роля в процеса на неолитизация и добива широко разпространение през ранния неолит в Югоизточна Европа, неговото използване и значение намаляват, най-вероятно през периодите Караново III или III–IV (Gurova 2011b). Не би следвало да допускаме, че са настъпили естествени ограничения за достъп до източниците на BF през късния неолит. Въпреки това дълбоката трансформация в моделите на селищната и социалната структура на общностите очевидно провокира нова стратегия за суровинно снабдяване и ползване.Това води до деградация/изоставяне на традиционните мрежи – първо на тази на балканския флинт, но също така и на трансрегионалната мрежа за разпространение на обсидианови артефакти (спорадична, но съществуваща през ранния неолит).

Повечето къснонеолитни кремъчни ансамбли показват разнообразие в суровините, използвани за дебитаж и оформяне на оръдия. Суровините са главно локални, набавяни от достъпни вторични/разсипни находища на силициеви скали. Нуждите на многобройните неолитни обекти в Тракия са били задоволени от лесно достъпни суровини в басейна на р. Марица (съдържащ алувиални-колувиални седименти), богати на преотложени материали от палеогенови кремъчни скали, широко разпространени в пловдивския район и

Източни Родопи. Повече информация за суровините от ранния и късния неолит ще бъде представена в следващите раздели.

ЧАСТ II – ПРЕДСТАВИТЕЛНИ ПРИМЕРИ (АНСАМБЛИ)

ВЪВЕДЕНИЕ

След общия прегледа в Част I, базиран на синтез на повече от четиридесет неолитни обекта, проучването предоставя в Част II осем детайлно проучени ансамбъла (примери) от обекти от различен „тип“, позволявящи компаративни наблюдения върху особености и общи черти в характеристиките на кремъчните колекции. Пет от ансамблите са от раннонеолитни обекти, а 3 се отнасят към късния неолит (фиг. 52). Допълнителен, но важен аргумент за избора на ансамбли-примери е фактът, че някои емблематични обекти са изследвани и публикувани отдавна и с различен концептуален, интерпретативен и технически фокус на проучванията. На последно място, но не и по важност, от гледна точка на суровините/BF приоритет имат обектите в Северна България и тези, отнасящи се към началото на неолитната секвенция. В този смисъл преференциалната позиция на Върбица, Джулюница и Ярловица е напълно основателна. Към това се добавя и фактът, че те се намират в тази част от регионалната неолитна ойкумена, която съдържа основната част от известните ни кремъчни суровини, а това е добра възможност за компаративни наблюдения. Долината на р. Струма, като най-вероятен коридор за първите неолитни миграционни групи, е представена от обекта Илинденци, чиято раннонеолитна секвенция е предхождана от тази в Ковачево и ансамблите им разкриват силни регионални характеристики в континюитивен аспект. Ранният неолит в Тракия (Карановo I) е показан чрез представителен селективен комплекс от обекта Ябълково. Къснонеолитните обекти са представени чрез три примера: селищният обект Харманли, отнасящ са към периода Карановo IV в Тракия; обектът от т.нар. тип „ямно поле” Сърнево (недалеч от Карановската селищна могила), представящ периода Карановo III–IV и накрая – от наскоро открития обект Бранковци в Северозападна България, чиято географска близост до раннонеолитния обект Ярловица предоставя добра възможност за сравнение на двата кремъчни ансамбъла в суровинен и техно-типологически аспект.

Всички ансамбли, избрани като представителни примери, са анализирани и описани с прилагането на единен структурен и методологичен подход, включващ следните раздели:

- Въведение;
- Суровини: характеристики и стратегии за добив;
- Техно-типологически анализ;
- Функционални характеристики/конотации;
- Общи наблюдения и дискусия.

Техно-типологическите описания и анализи се основават на следната класификация:

- типологически оръдия;
- продукти на дебитажа, включително:
  - а) пластини (включително фрагменти);
  - б) отломъци (само цели);
  - с) фрагменти – разделени на: фрагменти от отломъци (с морфологични

параметри на отломъци, но без запазени основи или проксимални части) и неопределими фрагменти/отпадъци.

- ядра;
- разни.

Ансамблите тук са представени накратко, с акцент върху въвеждащите и заключителни раздели от цялостното им представяне в дисертационния труд.

КРЕМЪЧЕН АНСАМБЪЛ ОТ ВЪРБИЦА (РАНЕН НЕОЛИТ) (фиг. 53–61; табл. 4–6)

Разкопките на обекта Върбица са проведени в два малки сондажа в рамките на два сезона (2015 и 2017 г.). Открити са значителни по количество и представителност находки, които позволяват на проучвателите да извършат сравнителни анализи с обекти както в Централна Северна и Североизточна България, така и в Тракия, с фокус върху керамичното производство и типология (Венелинова, Григоров 2017, 2019). Обектът е интригуващ и значим със своята неолитна секвенция, включваща периодите Караново I–III според периодизацията на В. Николов (Николов 1998; Nikolov 2004, 14–17; 2017). Радиовъглеродните дати за цялата последователност потвърждават културната и стратиграфската периодизация, представена от изследователите. Следователно Върбица не може да бъде пренебрегната като важна отправна точка в дебата за неолитизацията както на регионално, така и на надрегионално равнище. Съществен принос към цялостната характеристика на обекта представлява представеният тук анализ на кремъчната индустрия, както е отбелязано и в специализираните археометрични изследвания върху кремъчните суровини в Северна България (Gurova et al. 2022a–b).

Кремъчният ансамбъл включва 108 артефакта. Общата му структура, съобразно представената по-горе техно-типологическа диференциация, е представена в таблица I[1].

Общи наблюдения и дискусия

Ансамбълът от Върбица позволява общи наблюдения и поставя въпроси, които ще бъдат обсъдени по-долу.

1 Номерацията на таблиците в резюмето е с римски цифри, за да се избегне дублиране с оригиналната номерация на таблиците в основния текст.

Таблица I

Контекст	Оръдия	Пластини	Отломъци	Фрагменти	Ядра	Общо
Повърхност	9	6	1	3	1	20
Сондаж 2	1	1	6	1		9
Сондаж 1	22	19	24	14		79
Пластове I–III/ K III	12	10	15	8		45
Пластове IV–VI/ *K II–III*	4	3	3	1		11
Пластове VII–X/ *K II*	4	4	2	2		12
Пластове XI–XV/ *K I*	2	2	4	3		11
Общо	32	26	31	18	1	108

- Като цяло присъстват два хетерогенни ансамбъла/компонента (както по отношение на суровината, така и по техно-типологически характеристики). Единият е в артефакти, произхождащи главно от повърхността и съответства на характеристиките на типична халколитна кремъчна индустрия. Няколко артефакта от този малък комплекс принадлежат на отделни неолитни пластове, като обяснението на този контекстуален и стратиграфски „дисонанс“ може да се свърже с по-късно вкопана постройка (с рециклиран материал) от късната античност. Вторият ансамбъл/компонент включва артефакти от слоеве XV до IIA и може да бъде определен като раннонеолитен, с присъствие на отделни диагностични оръдия (описани в предходната Част I) и характерни за културното *koiné* на Караново I–II. Характеристиките на този кремъчен компонент са устойчиви и доминират до края на неолитната секвенция на селището, която теоретично би трябвало да съдържа и преход към първите фази на късния неолит. Сред артефактите от Върбица не се наблюдава тенденция към микролитизация: няма малки и микроядра, серии от пластинки, микростъргалки или геометрични микролити. В този смисъл ансамбълът от Върбица се отличава значително от познатите по публикации ансамбли от Североизточна България, и по-специално от този от Усое (Скакун 1994; Gatsov 1990);

- Ансамбълът от Върбица поставя въпроси относно появата на лудогорския флинт в ясен неолитен контекст. В продължение на десетилетия т.нар. „добруджански кремък“ беше по-скоро мит, основан на неправилно тълкуване на термина, използван от Е. Комша (Comşa 1976). В различни публикации терминът е интерпретиран по различен начин като най-често означава кремък с произход от българската Добруджа (регион Лудогорие), съответно наричан лудогорски кремък и описан от Ч. Начев (Начев 2009). Спорадичното присъствие на лудогорски (добруджански) кремък в раннонеолитните кремъчни ансамбли от Западна България е споменато от Н. Скакун, която обаче подчертава, че експлоатацията и разпространението на този кремък започва през халколита (Скакун 1993). Макроскопската близост на кремъка тип Крива река с типичния балкански флинт (BF) ме доведе до първоначалната хипотеза за произхода на BF, представена в по-ранно изследване (Gurova 2008a). По-късните индердисциплинарни анализи на видовете суровини убедително опровергаха тази хипотеза, но визуалното сходство между BF и типа Крива река продължава да поражда спекулации. Независимо от това въпросът за най-ранното

регистрирано (предхалколитно) присъствие на лудогорски кремък в праисторическите ансамбли остава отворен и изисква провеждането на съответни изследвания на артефакти със сигурен неолитен контекст, които да се сравнят с наличните археометрични анализи на лудогорски кремък.

- Върбица и дебатът за неолитизацията е тема, заслужаваща интерес в общия контекст на появата на първите земеделци в Североизточна България. Дори като предварително наблюдение може да се потвърди, че обектът заема стратегическо положение по отношение на произхода и разпространението на суровините, включени в пълния раннонеолитен „пакет“. Няма свидетелства за работилници за първично производство на балкански флинт и сходния му визуално флинт Шумен I. От една страна, в ансамбъла са регистрирани диагностични раннонеолитни оръдия от типичен балкански флинт и локалния кремък тип Шумен I , подобни на тези от културния кръг на Караново I–II, което предполага взаимодействия между тези региони през ранния неолит. На базата на GIS реконструкции на пътищата за разпространение на суровини може да се предполага, че през ранния неолит обектът Върбица би бил подходящ пункт за преразпределяне на кремъчни суровини от типа Шумен I и II към Тракийската низина. От друга страна, Джулюница и Върбица са добре позиционирани за взаимен обмен на BF и кремъци Шумен I–II, когато обектите са обитавани едновременно (Gurova et al. 2022b; 2025). Следва да се подчертае, че резултатите от микропетрографията и геохимическия (елементен) анализ показват сходства между артефактите от Върбица, Джулюница и Караново, особено относно тъмносивите с бели включения кремъци, чийто произход не е непълно изяснен (Gurova et al. 2022b). Върбица е несъмнено един от важните обекти в Северна България. Неговата роля за утвърждаване на раннонеолитния бит и култура както на регионално, така и на надрегионално ниво, следва да бъде сериозно преосмислена от праисторическата колегия, което се надявам да се случи след пълното публикуване на обекта, с внимателно анализирани находки и включени ^{14}C дати.

КРЕМЪЧЕН АНСАМБЪЛ ОТ ДЖУЛЮНИЦА (РАНЕН НЕОЛИТ) (фиг. 62–78; табл. 7–11)

Значението на кремъчните индустрии за разбирането на процеса на неолитизация едва ли се нуждае от допълнителна аргументация. От друга страна, все още липсват задълбочени интерпретативни изследвания, основани на надежден емпиричен материал, които да обогатят концептуално дебата за неолитизацията от гледна точка на кремъчните ансамбли.

Междувременно в светлината на иновативните интердисциплинарни изследвания върху суровините, използвани от раннонеолитните заселници в България, раннонеолитните кремъчни ансамбли добиха нова информативна и гносеологична тежест (Bonsall et al. 2010; Gurova et al. 2016, 2021, 2022a–b). Допълнителен принос към темата представлява детайлното изследване на кремъчните ансамбли от един от най-интересните неолитни обекти в България – Джулюница–Смърдеш (за по-кратко Джулюница). Неговото значение за неолитизацията (многократно подчертано в предходната част на труда) беше загатнато в по-ранни мои публикации, базирани на резултатите от пилотно проучване на 178 артефакта от най-ранните фази, което очерта потенциалната роля на Джулюница в добива на балкански кремък и последващото му разпространение към предкарановски анклави в Южна България (Gurova 2012; 2018b; Gurova, Bonsall 2014a). В настоящото подробно изследване се представят характеристиките на богатия и много информативен

кремъчен ансамбъл, предоставящ допълнителни доказателства за проверка на тази моя ранна хипотеза.

Структурата на ансамбъла е представена в таблица II.

Таблица II

Фаза	Оръдия	Пластини	Отломъци	Фрагменти	Ядра	Разни	Общо	Използвани
ДЖ I	24	87	253	181	4	9	558	31
ДЖ II	49	147	362	181	11	10	760	49
Общо	73	234	615	362	15	19	1318	80

Общи наблюдения и дискусия

Във фазите I и II на неолитната секвенция преобладават два типа суровина: балканският флинт (BF) с неговите разновидности (лесно разпознаваеми макроскопично) и (тъмно-)сив, с бели петнисти включения кремък. Те се срещат в близки пропорции и в двете фази на обекта. Не са регистрирани типични диагностични оръдия от балкански флинт, макар че ретушираните пластини доминират в типологическия репертоар. Забележимо е присъствието на стъргалки, лющници и три геометрични микролита. Функциите на използваните артефакти в контекста на идентифицираните дейности предполагат, че животновъдството и животинските субпродукти са били от същото (ако не и по-голямо) значение като земеделието.

В контекста на продължаващия неолитизационен дебат Джулюница играе важна роля, която може да се резюмира по следния начин:

- Джулюница предоставя най-ранните дати за начало на неолитната секвенция в България, като „ … в момента се оказва ключов обект за определяне на характеристиките на най-ранния неолит в Балканите” (Krauss 2023, 141). Обектът е част от предкарановския комплекс в Северна България;

- Керамичните ансамбли от Джулюница I и II показват по-близки паралели с обекти в Анатолия, като най-убедителните паралели са с обекти от Западна Анатолия и Мраморно море. Тази близост с ранноеолитните куртури от споменатите региони се потвърждава от резултатите на археоботаническите и археозоологически анализи;

- Работната хипотеза относно ролята на обекта в поетапния процес на неолитизация на нашите земи може да се обобщи по следния начин:

а) Обитателите на Джулюница (като част от предкарановския субстрат) основават селища в Североизточна България след като проникват в региона от Северозападна Анатолия през Босфора и по крайбрежието на Черно море около 6400 г. ВС (Özdoğan 2006; 2011a–b).

б) Движението западно от крайбрежието навътре в сушата вероятно е било провокирано от търсене на най-подходящите земи за земеделие и добив на подходящи кремъчни суровини. Най-вероятно мигрантите са достигнали находищата на висококачествен кремък (подобен на балканския флинт) в и около Шумен и са познавали източници на тъмносивия кремък с множество вторични находища в басейна на река Русенски Лом. Джулюница се намира на 60 km от клъстера на находищата в Шумен и на 80–100 km от клъстера на балкански флинт в района на Плевен–Никопол. Теоретично селището би могло да има посредническа роля в разпространението на BF (под формата на кремъчни

конкреции и артефакти) от находищата и работилниците (все още слабо или непроучени) в Северна България към селищата-потребители от културния кръг Караново I–II в Тракия. Тази мрежа е била позната и използвана от предполагаемите мезолитни/преднеолитни общности, живеещи най-вероятно близо до Дунав и неговите притоци (както е предложено от Gurova & Bonsall 2014b).

в) Притежавайки технологичните умения за производство на пластини (know-how, привнесено от региона на Мраморно море – наблюдение, базирано на проучените от мен кремъчни инвентари от Илъпънар и Ментеше), обитателите на Джулюница са могли успешно да напреднат в производството на пластини в някои все още неизвестни работилници близо до находищата или селището. Приемайки, че е имало преднеолитна експлоатация и разпространение на BF (най-добрите източници на който се намират в клъстера Плевен–Никопол), заселниците на Джулюница биха могли да включат производството на пластини в мрежата на регионален и надрегионален обмен на стоки.

г) В случай че не са проявявали особен интерес към оформянето и използването на диагностични оръдия от пластини от балкански флинт, майсторите от Джулюница може да са решили да се съсредоточат върху дебитажа на пластини и последваща тяхна дистрибуция към (пред-)Караново I анклави в Тракия, които очевидно се превръщат в основни консуматори на кремъчната продукция от Северна България.

Тази хипотеза, както и многото допълнителни аргументи, представени в по-рано цитирани публикации (включително новите данни от генетични изследвания – виж Gurova 2018, 136–137), ми се струват още по-актуални след обстойното проучване на кремъчни ансамбли от Джулюница I и II. Бъдещи допълнителни изследвания на кремъчни колекции от раннонеолитни обекти в Северна България и релевантен интердисциплинарен анализ на техните суровини безспорно ще допринесат за по-устойчиви и детайлни сценарии и концептуализация на неолитизационния процес.

КРЕМЪЧЕН АНСАМБЪЛ ОТ ЯРЛОВИЦА (РАНЕН НЕОЛИТ) (фиг. 79–94; табл. 12–14)

Археологическите проучвания в Ярловица разкриха еднослоен обект, разположен върху висока заливна тераса на левия бряг на р. Мечкобор – приток на р. Скомля, която се влива в Дунав. Северната част на обекта се намира върху обработваема земя с почти равнинен терен, докато южната част е разположена върху стръмен склон към реката. Първоначално северният сектор е изследван чрез 31 сондажа. Основните разкопки са проведени по разчистения склон, разделен на сектори (Todorov et al. 2020).

Керамиката е силно фрагментирана, с обезличена повърхност и загладени ръбове. Керамичният комплекс се счита за сходен с този от Оходен, отнесен към фазата Старчево IIb (Todorov et al. 2020, 220). Вероятно през този период е съществувало селище върху обитаемата заливна тераса, чиито останки са били разрушени в древността и погребани под по-късни наслаги. Разкритите структури принадлежат най-вероятно към периферията на селището.

Кремъчната индустрия е богата и представителна, но за съжаление е преотложена по склона и лишена от първичния си контекст, срещайки се в слой от кафяво-черен седимент (Todorov et al. 2020, fig. 2). Въпреки това реално когнитивно затруднение, ансамбълът заслужава да бъде представен поради репрезентативността му като суровинна характеристика и техно-типологически репертоар.

Кремъчният ансамбъл от Ярловица включва 974 артефакта от сондажи и сектори, кои-

то не могат да бъдат отнесени към конкретни археологически структури. Общата структура на ансамбъла е представена в таблица 1. Очевидно се откроява преобладаването на дебитажа, както и необичайно големият брой ядра, като последното определено е нетипично за раннонеолитните ансамбли.

Структурата на ансамбъла е представена в таблица III.

Таблица III

Ансамбълът в цялост	Оръдия	Пластини	Отломъци	Фрагменти	Ядра	Разни	Общо
Общо	84	177	310	355	25	23	974

Общи наблюдения и дискусия

Ансамбълът от Ярловица е интригуващ в следните аспекти: а) изобилието на балкански кремък (BF), което придава впечатление за относителна суровинна хомогенност; б) паралелите на керамичния материал с културата Старчево IIb и Оходен изисква сравнение между кремъчните колекции на Ярловица и Оходен от една страна, и между Ярловица и индустриите от Старчевската културна група в Сърбия – от друга страна; в) сравнението с Джулюница е много предизвикателно, тъй като керамиката от Джулюница I и II показва по-близки паралели не със Старчевския културния комплекс (както е при другите раннонеолитни обекти в Централна Северна и Северозападна България), а с обекти в Анатолия, като най-близки са паралелите с обекти от Западна Анатолия и Мраморно море. Следователно ансамбълът от Ярловица е интригуващ, тъй като потенциално притежава дуалистични характеристики между два коренно различни раннонеолитни културни контекста – Старчевския комплекс и този от Северозападна Анатолия.

В сравнителна перспектива с ансамблите от културата Старчево може да се отбележи, че ролята на BF е убедително и сериозно призната като неизбежен фактор в процеса на неолитизация на Централните Балкани (по-точно Североизточна Сърбия и феномена Железни врата). Предвид обстоятелството, че единственият сигурно идентифициран клъстер с местонаходища на балкански флинт се намира в Централна Северна България, то българските раннонеолитни обекти както тези близо до находищата (като Джулюница), така и по-изолираните в Северозападна България (като Ярловица) стават потенциално значими като центрове за дистрибуция и редистрибуция на балкански флинт. Други сценарии също са възможни, като например хипотезата, че BF е бил разпространяван от странстващи специалисти – чиято мобилност е обезпечавала и добива на суровини, и циркулацията на балканския флинт и неговите дериватни продукти. За съжаление нито една от тези възможности не може да бъде изключена и нито една не може да бъде потвърдена.

Очевидно най-убедителното и емпирично доказуемо е сходството между ансамблите на Ярловица и Джулюница. По отношение на суровината близостта се изразява във високата честота на BF сред всички техно-типологически категории артефакти, особено сред оръдията. Има обаче и разлика, която се състои в това, че в Ярловица тъмносивият с бели петна кремък практически липсва, за разлика от другите светлосиво-бежови колористични варианти на балканския флинт. Що се отнася до типологическия репертоар, сходството се състои в превес на ретуширани пластини, следвани от стъргалки на пластини, ретуширани отломъци и лющници. Резците и изделията с ретуширани вдлъбнатини

са минимално представени. В Ярловица са регистрирани повече перфоратори/свредели и оръдия с напречно затъпяване, отколкото в Джулюница. От друга страна ансамбълът от Ярловица е напълно лишен от геометрични микролити. Друга разлика се наблюдава във функционалните параметри на инструментариума. Изненадващо в Джулюница са регистрирани малко елементи от сърп, за разлика от артефактите, използвани за обработка на животински продукти – разфасовка на месо, обработка на кожи и кости. В Ярловица, напротив, елементите от сърп доминират драстично, докато обработката на животински продукти е минимална. Този факт повдига въпроси, но следва да се има предвид, че анализът на следите от употреба обхваща само представителни извадки от двата ансамбъла.

В обобщение, въпреки липсата на абсолютни дати и някои значими специализирани изследвания (палеоботаника и археозоология), обектът Ярловица със своето крайно северозападно местоположение на територията на България е изключително важен (видно от кремъчния му ансамбъл) за реконструирането на мрежата за разпространение на балкански флинт на Балканите.

КРЕМЪЧЕН АНСАМБЪЛ ОТ ИЛИНДЕНЦИ (РАНЕН НЕОЛИТ) (фиг. 95–107; табл. 15–17)

Илинденци е част от група неолитни обекти в средното течение на р. Струма, които предоставят възможности за регионален и надрегионален диахронен анализ, подчертавайки динамичните културни и социални взаимодействия и обменни мрежи между обектите (Grębska-Kulow, Zidarov 2020; 2021). Относителната хронология на структурите и находките е подкрепена от радиовъглеродни дати.

Ранният неолит в Илинденци е представен от по-късната (горна) фаза, съвременна с Ковачево Ic–Id и свързана с културното *koiné* на Караново I (Lichardus-Itten et al. 2006; Grębska-Kulow 2017). Изследванията в Илинденци са от ключово значение за разбирането на прехода от ранния към средния неолит на регионално равнище, както и на взаимодействията със съседни раннонеолитни култури като Гълъбник и Анзабегово–Връшник. Как реагира кремъчната индустрия на това когнитивно предизвикателство? Предоставя ли тя значими данни в диахронна перспектива? И как се вписва в по-широкия контекст на раннонеолитните регионални и надрегионални процеси на Балканите, особено по отношение на разпространението на балканския кремък под различни форми, включително „пакета" диагностични оръдия от BF? Анализът, представен в дисертационния труд, търси отговор на тези въпроси.

Структурата на ансамбъла е представена в таблица IV.

Таблица IV

Суровини	Оръдия	Пластини	Отломъци	Фрагменти	Миниатюрни отпадъци	Ядра	Разни	Общо
Балкански флинт	14							14
Други	58	18	60	63	59	6	4	268
Кварцит	3	3	25	7		1		39
Общо	75	21	85	70	59	7	4	321

Общи наблюдения и дискусия

Първото наблюдение е, че детайлното хронологично и културно подразделяне на

секвенцията, основано на статистическия анализ на керамиката, не се долавя в кремъчния ансамбъл. Идентифицирането на диахронни промени или трансформации в сравнително малочислената кремъчна колекция е неустановимо. Микропробои, изработени от местни суровини като халцедон и кварц, се появяват едновременно с диагностичните раннонеолитни оръдия от балкански флинт (BF). Това показва сравнително развити фази на ранния неолит, когато културата Караново I се проявава регионално в югозападния си вариант. Отнесен към секвенцията в Ковачево, този раннонеолитен слой в Илинденци съответства на фазите Ic и Id в Ковачево, което се потвърждава от анализа на керамиката (Grębska-Kulow, Zidarov 2020).

Ансамбълът от Илинденци е информативен и значим по няколко причини: а) наличие на диагностични оръдия от BF; б) наличие на 33 микропробоя/свредела; в) значително присъствие на кварцитни артефакти, включително три типологически оръдия. Диагностичните оръдия от BF са представен в колекцията от Илинденци в пълния си репертоар – ретуширани пластини и елементи от сърп. Важно е да се отбележат сходствата между инструментариума от BF в Илинденци и този от Ковачево, което предполага синхронизация на културните събития през ранния неолит – и в двата обекта този инструментариум са отнася към развитите фази на ранния неолит: фазите Ic и Id в Ковачево и фазите I и II в Илинденци. През този период именно регионът става част от югозападния вариант на културата Караново I (Николов 1996).

Възниква въпросът дали керамичният комплекс от Илинденци показва черти, които предхождат фазите Ic и Id в Ковачево, което би хвърлило светлина върху поетапното/постъпателно влияние на културата Караново I върху ранния неолит в региона. Отговорът на този въпрос предполага по-задълбочено проучване и разбиране на етапите на неолитизация в средното течение на река Струма, както и на културните взаимодействия с културите Овче поле и Анзабегово–Връшник. От гледна точна на кремъчната индустрия релевантно сравнение на диагностичните оръдия от BF с тези от съседните региони не е възможно без специализирани геологически изследвания и лабораторни анализи. В. Димитровска е публикувала ограничен брой артефакти от BF от шест праисторически обекта в Република Северна Македония, включително Анзабегово и тези артефакти са макроскопски идентични на диагностичните раннонеолитни оръдия от България (Димитровска 2012; 2013). Произходът на флинта на тези артефакти от Северна Македония остава неясен като хипотетично се счита за местен, но без да са представени убедителни аргументи в подкрепа на тази хипотеза.

Колекцията от микропробои/свредели може да се интерпретира на две нива: първо, като функционален набор оръдия, включени в специализирано производство на самия обект; второ, като част от изработката на мъниста, които сами по себе си са индикативни за миграциите на раннонеолитни групи от Югоизточна към Централна и Северна Европа (*vide infra*, Rigaud et al. 2015). Близък аналог на микросвределите от Илинденци се открива в значително по-обширната колекция от микропробои и свредели от Ковачево (Gurova 2006; Gurova et al. 2013; Gurova, Bonsall 2017). И двете колекции показват сходства в морфологията и технологията, но има съществени различия в характеристиките на използваните суровини. Микроинструментите от Ковачево са изработени от тъмносив до черен кремък, добит от Западните Родопи, докато инструментите от Илинденци са предимно от халцедон и кварцит/кварц, като едно изделие е от жълт яспис. Друго съществено различие е в контекстуалната им поява в културната последователност. В Ковачево тези инструменти са част от най-ранната фаза на обитаване, докато в Илинденци те се появяват

в хетерогенен контекст, принадлежащ към крайната фаза на ранния неолит.

Появата на микропробои/свредели като отделни компоненти в типологичния репертоар на раннонеолитните ансамбли повдига интригуващ въпрос: дали тези инструменти служат за конкретни функционални нужди, като изработката на мъниста и други орнаменти и украшения, употребявани в рамките на общността, или свидетелстват за мобилността на неолитни групи и артефакти – от юг на север, които носят със себе си нови знания, умения, вярвания и символика? Алетрнативно – възможна ли е комбинация от двата фактора? Изследвания, базирани на голяма емпирична колекция от мъниста от цяла Европа, подкрепят тези разсъждения. Както отбелязват Rigaud и съавтори (Rigaud et al. 2015) „...артефакти с изключително символни функции обикновено се считат по-информативни и полезни за проследяването на културни влияния между популации и модели на културна промяна във времето, отколкото артефакти с чисто утилитарно предназначение“ (ibid., 1).

В светлината на тази констатация типовете мъниста и лични орнаменти трасират навлизането на неолитния начин на живот от Анатолия през Балканите до Централна, Западна и Северна Европа, подобно на други елементи от материалната култура, често наричани „неолитен пакет“. Оттук и ново предизвикателство за изследователите: да се разшири проучването и да се задълбочи разбирането на производството на мъниста и лични орнаменти в България през ранния неолит, като аспект от интегрирането на територията ни в комплексния неолитизационен процес.

КРЕМЪЧЕН АНСАМБЪЛ ОТ ЯБЪЛКОВО (РАНЕН НЕОЛИТ) (фиг. 108–112; табл. 18–21)

Голямото селище Ябълково е разположено на южния бряг на р. Марица в Горнотракийската низина, което го вписва географски, палеоекологично и културно в динамичната среда на раннонеолитната култура Караново I. Дългогодишните проучвания, проведени в рамките на различни инфраструктурни проекти, завършиха с изчерпателен том върху раннонеолитните пластове на обекта, в който настоящият автор има самостоятелна глава (Gurova 2014; Roodenberg et al. 2014). Представеният в монографията текст е актуализирана версия, съзнателно отчитаща факта, че Ябълково представлява „перла“ от гледна точка на представителния репертоар на диагностичните оръдия от балкански флинт – една от най-значимите и отличителни характеристики на койнето Караново I–II в раннонеолитната индустрия.

Според изследователите комплексът от Ябълково се отнася към ранния неолит с близост до култура Караново I с ясно изразено анатолийско влияние (Leshtakov 2006; Leshtakov et al. 2007). Абсолютните дати (публикувани по-късно) показват, че раннонеолитното обитаване обхваща първите три века на VI хил. пр.Хр. (Roodenberg 2014). По този начин обектът се утвърждава като един от най-значимите, интригуващи и богати по отношение на материалната култура раннонеолитни обекти в Тракия.

Ключова характеристика на обекта е наличието на едни от най-богатите и добре представени диагностични оръдия от балкански флинт – белег на раннонеолитните кремъчни индустрии на културния кръг Караново I–II в България и една от характеристиките на надрегионалния технокомплекс Караново I–Старчево–Криш–Кьорош.

Моето проучване обхваща колекция от разкопките през 2003 г., която представлява малка част от цялостния кремъчен ансамбъл, публикуван поетапно от колегата Р. Златева (Zlateva-Uzunova 2014; Златева-Узунова 2025). Монографията ми съдържа акуализиран

прочит на изследваната колекция с неизбежни коментари и препратки към съществуващите публикации.

Структурата на ансамбъла е представена в таблица 1 и показва диспропорционалното съотношение между различните категории с ясно изразено преобладаване на оръдията и отсъствие на ядра (таблица V)

Таблица V

Ансамбълът в цялост	Оръдия	Пластини	Отломъци	Фрагменти	Разни	Общо
Общо	120	24	45	46	9	244

Общи наблюдения и дискусия

С ясното осъзнаване на ограничената емпирична основа на това изследване за каквито и да е заключения, има някои аспекти, които заслужават коментар.

- Регистрирано е експедитивно/опортюнистично производство, базирано на локални и регионални суровини, които Р. Златева-Узунова описва в своя труд, но без критерии и ясно разграничение на произхода им в рамките на тази „регионалност“.

- Темата за доставката и разпространението на суровини следва да бъде разглеждана в два основни аспекта – балкански флинт и останалите локални суровини. Относно BF следва да се припомни, че са публикувани (с отворен достъп) серия от индердисциплинарни изследвания (Bonsall et al. 2010; Gurova 2012a; Gurova, Bonsall 2014a; Gurova et al. 2016; 2022a–b). В повечето от тези публикации Ябълково е идентифицирано чрез серия артефакти и е интегрирано в концептуалната рамка на балканския флинт и мрежата му на разпространение през ранния неолит. Освен това с помощта на GIS и на базата на аналитично доказано сходство/дискриминация между суровините и артефактите са определени разстоянията между геологично идентифицираните находища на балкански флинт и селищата-потребители. В тази схема Ябълково се намира приблизително на 119 km от клъстера суровинни източници в Никопол (Gurova et al. 2022b).

- Основната част от типологическите и функционални оръдия е изработена от BF, като повечето от тях могат да бъдат отнесени към категорията диагностични оръдия. Този характерен инструментариум е несъмнено „импортно“ явление за Ябълково. Като селище-ползвател/консуматор Ябълково е участвало в мрежата за обмен на артефакти от балкански флинт.

- Функционалният анализ на кремъчните артефакти показва доста специфични резултати с някои аналогии с функционалните данни от ансамбъла в Ковачево и разлики спрямо някои изследвани обекти в Северозападна Анатолия (Gurova 2006). Функционалните параметри на кремъчната индустрия в Ябълково като цяло изисква по-подробно изследване и интерпретация.

- Ябълково е четвъртият раннонеолитен обект, на който са регистрирани геометрични микролити. Би било от съществено значение тези находки от всички обекти (Ябълково, Ковачево, Оходен и Джулюница) да се сравнят с оглед контекстуални данни и хронология, за да се осветли един от „преднеолитните“ (поне теоретично) компоненти на кремъчната индустрия и да се обясни тяхната нерегулярна поява през ранния неолит. От друга страна, предизвикателство ще бъде сравняването им с многократно по-богатите серии геометрични микролити от късния неолит.

КРЕМЪЧЕН АНСАМБЪЛ ОТ ХАРМАНЛИ (КЪСЕН НЕОЛИТ) (фиг. 113–124; табл. 22–24)

Кремъчният ансамбъл от Харманли беше публикувана през 2010 г. заедно с общото контекстуално представяне на обекта (Bacvarov et al. 2010; Gurova 2010). Селището е разположено между два десни притока на р. Марица, върху първата надзаливна тераса. Освен три ями, не са разкрити други археологически структури, което води изследователите до извода, че проучванията са обхванали периферната част на селището (Bacvarov et al. 2010, 135). Трите стратиграфски пласта, както и запълнителите на ямите, съдържат керамика, датираща от периода Караново IV — финалната фаза на неолитната културна секвенция. Кремъчният ансамбъл е многоброен (1445 артефакта) и притежава основните характеристики на къснонеолитната индустрия. По отношение на хоризонталната стратиграфия преобладава материалът от културния пласт в 11 изследвани квадрата (1365 или 94,5% от всички находки), за разлика от ограничените находки от двете ями: 23 бр. от Яма 1 и 35 бр. от Яма 2 ., както и 21 бр.от повърхността . Повърхностният материал включва четири типологически оръдия с къснонеолитен облик, включени в статистическия анализ.

Общата структура на комплекса по контексти е представена в таблица 1, където се откроява доминирането на продуктите на дебитажа, сред които пластините са изненадващо малобройни.

Структурата на ансамбъла е представена в таблица VI.

Таблица VI

Категория артефакти	От сектори	Яма 1	Яма 2	Повърхност	Общо
Типологически оръдия	89	2	1	4	96
Пластини	86	1	1		88
Отломъци	353	5	11	4	373
Фрагменти	647	6	15	8	676
Люспи от ретуш	105	3	3	4	115
Ядра	11	1			12
Разни	74	6	4	1	85
Общо	1365	24	35	21	1445

Общи наблюдения и дискусия

Без да се правят категорични заключения, въз основа на наблюденията по време на изследването могат да се формулират някои съществени характеристики на кремъчния ансамбъл.

- Структурата на колекцията създава впечатление за добре организирана и функционираща експедитивна индустрия, потвърдена чрез използването на широк спектър местни суровини със средно качество. На място е била практикувана частична производствена верига със следи от тестване на различни суровини и техники.

- Могат да се реконструират поне две направления на *произведствиения цикъл:*

а) Дебитаж чрез директен удар с каменна чукалка, насочен към производство на отломъци, някои от които са оформени като оръдия. Оскъдният брой ядра за отломъци свидетелства, че този дебитаж е осъществяван в неразкрити части на обекта.

б) Отделяне на пластини чрез индиректен удар с посредник.

в) Отделна производствена верига, свързана с микролитизацията, включва отделяне

на пластинки от малки едноплощадкови ядра, вероятно чрез натиск (методи 1–3 според Pelegrin, 2012). Пластинките са използвани директно, което се потвърждава от големия брой неретуширани пластини със следи от употреба, или са преформирани в оръдия с рядка употреба.

- Типологическият репертоар е с ясно изразени къснонеолитни характеристики: доминиране на малки стъргалки на отломъци, висок процент ретуширани пластини, присъствие на геометрични микролити и единични реминисцентни форми на диагностични раннонеолитни оръдия (в случая 2 перфоратора върху ретуширани пластини и 1 пластина със стръмен билатерален ретуш, тип Карановo I). Паралели на изследваната колекция могат да се открият в къснонеолитните кремъчни ансамбли от цялата страна: Централна Северна България – колекциите от Самоводене и Качица (Цонев 2007); ансамблите от Западна България (Gatsov 1993); индустрията Усое в басейна на Камчия (Скакун 1994); както и ансамблите от Тракия – обектите Карановo и Драма–Герена (Карановo III–IV, особено култура Карановo IV) (Gurova 2002a; 2004a; 2019). Най-близки паралели на ансамбъла се проследяват в неолитните ямни обекти като Сърнево (Gurova 2017a; пример №6 в Част II) и Любимец–Дана Бунар 2 (Анастасова 2012; Anastassova 2009).

- Резултатите от трасологичния анализ са показателни за спектъра на използваните инструменти и за възможната реконструкция на поминъка и домашно производство на общността. Те безспорно показват развити земеделски практики и дейности, свързани с бита на населението. Тези резултати биха били още по-убедителни при наличие на археоботанически данни.

В българската специализирана литература, посветена на кремъчните индустрии, някои нововъведения (хипотези и концепции) не се приемат и прилагат лесно, докато други си остават маргинализирани. Пример за първия тип е концепцията за диференциацията на двата противоположни вида индустрии: тези, насочени към производство и потребление на „диагностични и типични оръдия“ (т.нар. formal tools) и противоположните, наречени „експедиентни или опортюнистични“ производства, базирани на *ad hoc* семпли оръдия. Тази тема е дискутирана в западната литература десетилетия наред, като един от най-успешните примери е илюстриран от Andrefski (1994). Френските праисторици, фокусирани върху концепцията за *chaîne opératoire* и всички нейни възможни траектории в емпиричен и теоретичен аспект, посвещават научни форуми на уточняване на номенклатурата, свързана с двата гореспоменати типа кремъчни индустрии (например Astruc 2005).

В нашата археологическа литература проблемът е повдигнат и успешно решен на регионално ниво от Ц. Цонев, който изучава неолитните и халколитните ансамбли от Централна Северна България (Цонев 2007). Колекции като тази от Харманли, произхождащи от обекти по речните тераси на Марица и нейните притоци, са потенциално много интересни за интерпретация по отношение на: 1) дефинирането на експедиентните индустрии, базирани на доставка на суровини от вулканичните скали на Родопите чрез множеството леснодостъпни разсипни находища; и 2) тяхното разграничаване от индустрии, базирани на импортни суровини чрез развити мрежи на доставка и обмен и на типологичен репертоар, включващ диагностични оръдия от балкански флинт, които продължават да се появяват като остатъчни форми на раннонеолитния инструментариум.

КРЕМЪЧЕН АНСАМБЪЛ ОТ СЪРНЕВО (КЪСЕН НЕОЛИТ) (фиг. 125–138; табл. 25–37)

Сърнево е първият (и засега единственият) напълно публикуван обект от типа „ямно поле“ (Bacvarov et al., eds. 2017). Тези специфични обекти бяха въведени в българската праисторическа проблематика като агломерации от ямни структури, интерпретирани като свързани по-скоро с ритуалната, отколкото с битовата сфера (Бъчваров 2017; Петрова и др. 2024; Nikolov 2011). Обектът е къснонеолитен и се отнася към периодите Караново III–IV в Тракия. Тази принадлежност е установена чрез релативна и абсолютна хронология (наличните C^{14} дати очертават времеви диапазон между 5355/5320–5335/5290 calBC (Cook et al. 2017, 509).

Относително многобройният кремъчен ансамбъл (1091 бр.) е публикуван от мен на български език с резюме на английски (Gurova 2017a). Ансамбълът е особено показателен, тъй като разкрива симбиоза на хетерогенни (по своята диагностична принадлежност) характеристики и е представен тук в по-обобщен вид. Артефактите произхождат основно от негативни структури (ями), от пласт 2 – приеман за стратиграфски надежден и съдържащ материали, идентични с тези от ямите, както и от пласт 1, характеризиращ се с нарушена стратиграфия, обединяваща находки от повърхността, орницата и преотложени материали. Според изследователите: „Пласт 1 е формиран от почвата, натрупана през хилядолетията след късния неолит, и от останките на човешка дейност през ранната и късната желязна епоха и къснориманския период. Пласт 2 е формиран от неолитната палеопочва и от останките на човешка дейност, свързана с къснонеолитните ямни депозити“ (Bacvarov, Tonkova 2017, 18). Това диференциране прави резултатите от анализа на кремъчната индустрия по различни контексти особено интригуващо в сравнителна перспектива. Както показват резултатите, представени по-долу, не се установява съществена разлика между материалите от двата пласта, която да подкрепи компрометирания характер на пласт 1.

Ансамбълът е представен съобразно това общо контекстуално диференциране в таблица VII.

Таблица VII

Категория артефакти	Структури	Пласт 2	Пласт 1	Общо
Типологически оръдия	92	60	76	228
Пластини	115	58	59	232
Отломъци	139	93	80	312
Фрагменти	82	63	87	232
Ядра	28	9	8	45
Разни	19	13	10	42
Общо	475	296	320	1091

Общи наблюдения и дискусия

Нямам амбицията да правя каквито и да е конкретни интерпретации на обекта, различни от концепцията на изследователите (въпреки дълбокия ми скептицизъм относно „ритуалния“ му характер). Не на последно място защото фрагментарната информация, с която разполагаме (въпреки разнообразните ѝ аспекти), и липсата на аналогични проучени ансамбли за корелация биха довели до предположителен и спекулативен характер на интерпретацията.

Въпреки че няма сериозни аналитични изследвания на представените в ансамбъла суровини, може да се обобщи, че суровинният спектър е богат и разнообразен. Срещат се балкански флинт, сиво-черен с бели петна висококачествен кремък и планински кристал. Отделно са представени разнообразни суровини с локален произход, регистрирани на повечето праисторически археологически обекти в Тракия, които са били достъпни чрез вторични/алувиални депозити от вулканичните скали на Източните Родопи, натрупани от големите речни притоци.

Кремъчните колекции от трите основни и представени тук контекста предоставят относителни данни за корелации и заключения. При все това някои сравнения на компонентите на емпиричната база данни могат да бъдат информативни и интригуващи. Таблица VIII представя категориите артефакти (в проценти) спрямо целия ансамбъл.

Таблица VIII

Категория артефакти	Структури	Пласт 2	Пласт 1
Типологически оръдия	19 %	20 %	23 %
Пластини	24 %	19 %	18 %
Отломъци	29 %	30%	25 %
Фрагменти	29 %	21 %	27 %
Използвани	7.5 %	8.4 %	7.8 %
Артефакти от BF	9. 4%	5.4 %	10 %
Ядра	5.8 %	3 %	2.5 %

До известна степен е учудващо, че съотношенията и балансът между техно-типологическите категории в трите комплекса са доста близки и сравними. Съществуват два аспекта, в които материалът от ямите се различава от артефактите от пластовете: а) ядрата в ямите са много повече; б) използваните артефакти, напротив, са значително по-малко.

Интересен би бил опитът да се предвидят критериите за селективност, прилагани от „потребителите“ на ритуалните обекти при подбора на артефакти за специално и предварително подготвените „ритуални пакети“. които са основният елемент в символното значение на ямния запълнител. Първичният анализ подсказва „приоритетна“ позиция на ядрата (които са най-обемните артефакти, подходящи за запълване – във волуметричен смисъл) и на артефактите от балкански флинт (които са най-естетически привлекателни и потенциално ценни). Няма разумни аргументи за какъвто и да е алтернативен подбор, защото кремъчните артефакти се третират като елементи с незначителна/ маргинална за същността на депозита, стойност. Тяхната роля се разглежда двустранно – като екзотична суровина и евентуално като артефакти, създадени специално за депозиране в ямите (Bacvarov 2017). Първото, в случая с BF и планинския кристал, е логично и приемливо. Второто според мен е незначително и спекулативно.

Сравнението на типологическия репертоар създава впечатление за относителна хомогенност на ансамблите от трите контекста (таблица IX). Това е особено валидно за две типологически категории, които са диагностични за късноенеолитната кремъчна индустрия: малките стъргалки и геометричните микролити. Геометричните микролити се появяват в Тракия в късноенеолитната секвенция (период Караново III–IV в едноименната селищна могила) и присъстват на обекти като селищна могила Караново, Драма–Герена, Дрянова могила и други „ритуални“ комплекси с ями като Любимец–Дана бунар 2.

Забелязват се обаче и известни различия в типологическия репертоар от трите контек-

ста – само ансамбълът от ямите показва превес на ретуширани пластини и е единственият, в който се срещат пластини с ретуширани вдлъбнатини и един резец. Съставът на кремъчния ансамбъл от ямите не дава основание да се предполага „преднамерено поставяне на специално подбрани разнообразни материали в ямите по определен начин“, както е описано от К. Бъчваров (Bacvarov 2017, 237).

Таблица IX

Типологическа категория	Структури	Пласт 2	Пласт 1	Общо
Стъргалки	26	22	28	76
Раннонеолитни диагностични оръдия	6	3	10	19
Ретуширани пластини	27	12	16	55
Пластини с напречно затъпяване	7	6	1	14
Геометрични микролити	4	5	6	15
Перфоратори/свредели	5	1	1	7
Ретуширани отломъци	6	5	7	18
Комбинирани оръдия	3		1	4
Пластини с ретуширани вдлъбнатини	2			2
Резец	1			1
Лющник			1	1
Фрагменти от оръдия	5	6	5	16
Общо	92	60	76	228

Технологичните параметри на ядрата и на продуктите на дебитажа индикират три техники на отделяне: а) директен удар с твърда чукалка – при отломъците; б) индиректен удар с посредник – при пластините и в) дебитаж чрез натиск за отделяне на малки пластини и пластинки с помощта на описаните от Ж. Пелегрен методи 1–3 (Pelegrin 2012).

Концептуалният и интерпретативен проблем на така наречените „комплекси с ями“ остава отворен в изчакване на повече емпирични данни (от сходни обекти в други региони) и убедителни аргументи за техния „ритуален“ характер. Що се отнася до кремъчната индустрия на обекти като Сърнево, очевидно е, че общността/общностите, обитавали обекта ежедневно, или посещавали го за практикуване на определени ритуали (вкл. запълване на ямите с разнообразни депозити), са оставили трайни следи от своя бит. В контекста на кремъчните ансамбли това означава, че те са произвеждали, използвали и изхвърляли инструментите си, балансирайки между планирано и *ad hoc* производство и употреба на оръдията.

КРЕМЪЧЕН АНСАМБЪЛ ОТ БРАНКОВЦИ (КЪСЕН НЕОЛИТ) (фиг. 139–144; табл. 38–40)

През 2019 г., в рамките на инфраструктурен проект по трасето на газопровода „Балкански поток“, бяха проведени две кампании спасителни археологически разкопки на селището при Бранковци. Археологическите проучвания разкриха еднослоен обект, чийто материал се отнася към късния неолит и разкрива близост с керамичните комплекси на културите Винча и Градешница (Kecheva et al. 2020). Хронологическата позиция е потвърдена чрез серия от пет ^{14}C дати от въглени, които очертават интервал на обитаване между 5500 и 5000 г. пр.Хр. (Kecheva et al. 2023). Обща информация за обекта, неговите структури и особености е представена в последната цитирана публикация (ibid.). Прецизната пространствена регистрация с GPS на всички находки позволи извършването на детайлен

пространствен анализ в рамките на общия план на обекта, в който чрез геофизическа карта са идентифицирани шест основни структури (Kecheva et al. 2023).

Общата структура на ансамбъла, базирана на техно-типологическа диференциация в контекста на основните структури, е представена в таблица X.

Таблица X

Контекст	Оръдия	Пластини	Отломъци	Фрагменти	Ядра	Разни	Общо
Жилище 1	4	3	6	11			24
Жилище 2	1	4	1	5			11
Жилище 3	2	4	5	2		1	14
Между жил. 2 и пещта	3	3	2	8			16
Около пещта	5	1	1	7			14
Вкопана структура		1	3	17			21
Яма	2		2	2	1		7
Структура 3	4		4	7			15
От квадратите	13	16	14	144		2	189
Общо	34	32	38	203	1	3	311

Общи наблюдения и дискусия

Керамиката от Бранковци е отнесена от специалистите към културите Винча и Градешница. По тази причина, както в случая с кремъчния ансамбъл от Ярловица, в изследването е предложено общо сравнение с кремъчните комплекси от сръбската неолитна секвенция, както и кратък преглед на колекциите от Сезерозападна България, проучвани преди десетилетия от И. Гацов. „Светът на Винча“ представлява интересна тема за изследователите повече от половин век. Особено внимание е отделено на кремъчните индустрии, които са във фокуса както от сръбските, така и от чуждестранни изследователи. Без навлизане в подробности може да се отбележат някои ключови аспекти, включително от моето проучване на материала от Дреновац (сезон 2004), който културно принадлежи към пост-Старчево – ранните фази на Винча (Gurova 2016). По-късният хронологически ансамбъл от Дреновац следва конвенционалния модел на репертоара на Винча (стъргалки > напречно затъпени оръдия > ретуширани пластини) (Kaczanowska, Kozłowski 1990). Следва да се отбележи, че този конвенционален модел не бе напълно потвърден от покъсни проучвания върху обекти, отнесени към фазата Винча–Плочник I (Bogosavljević-Petrović 2001).

Ансамбълът от Бранковци напълно съответства на аксиоматичната за Винча характеристика за превес на стъргалките, което е регистрирано на базата на редица ансамбли, отнасящи се към различни фази на културата Винча (Radovanović 1984). Подобна тенденция се наблюдава и в ансамбъла от Градешница в Северозападна България. Цялата секвенция на Градешница е доминирана от стъргалки (за разлика от други раннонеолитни обекти в Западна България, изучавани от И. Гацов (1993). Ниво C на Градешница се характеризира с промяна в типологическия репертоар и превес на стъргалките на отломъци, близко до ансамбли от Винча A (ibid., 33). Както вече беше отбелязано в предходната Част I, доминирането на стъргалки на отломъци е един от надеждните и диагностични индикатори на къснонеолитната кремъчна индустрия.

Нека насочим вниманието си от типологическите параметри към по-общия проблем

за дълбоката трансформация между ранния и късния неолит. Този процес на преход и промени в средата на VI хил. пр.Хр. е многоаспектен, с локални и надрегионални характеристики и с все още неизяснен произход. Освен промяната в стратегиите за снабдяване със суровини (вкл. спад в дистрибуционната мрежа на балканския флинт и увеличена роля на локални суровинни източници, захранващи експедиентното производство), се наблюдава промяна и в типологическия репертоар чрез микролитизация на индустрията. Тези промени и трансформации отлично се открояват при сравнението между ансамблите на близко намиращите се обекти Ярловица (ранен неолит) и Бранковци (късен неолит).

Що се отнася до ансамбъла от Бранковци, пространствено артефактите произхождат от всички регистрирани контексти (таблица 1), но са без данни за обособяване на зони, свързани с конкретни активности. Свидетелствата за развити земеделски практики в региона (регистрирани в случая с Ярловица) продължават и през късния неолит, което се потвърждава от наличието на елементи от сърп. Подобно на Ярловица, липсата на палеоботанически изследвания може частично да се компенсира с данни от съседни региони в Сърбия, където се наблюдава разширяване на културния спектър с нарастнала роля на двузърнестата (*Triticum dicoccum*) и еднозърнестата пшеница (*Triticum monococcum*) (Filipović, 2014). Подобно археоботаническо диахронно изследване, базирано на неолитните обекти в България, би било полезно за най-общи палеоикономически реконструкции с интегриране на данните от трасологическия анализ на кремъчните артефакти.

Бранковци предоставя малък, но информативен кремъчен ансамбъл, който допълва свидетелствата за трансформационните процеси между ранния и късния неолит и подчертава ролята на кремъчната индустрия като фактор, маркиращ тези промени.

ЧАСТ III – ДИАХРОННА ПЕРСПЕКТИВА, ДИСКУСИЯ И ЗАКЛЮЧЕНИЯ

1. ДИАХРОННИ СРАВНИТЕЛНИ НАБЛЮДЕНИЯ

Подходите към проблема за добиването и разпространението на суровините следва да се базират на надеждни геологически и, където е възможно, аналитични данни, или поне на подходящи макроснимки, съответстващи на визуално различими суровини сред артефактите. Публикациите на нашия екип предоставят такъв набор от данни за балканския флинт (BF), който отговаря на научните стандарти и осигурява солидна аналитична база, която може да се използва в бъдещи национални и международни проекти (виж раздел 2.3 в Част I).

Добре е да се припомни, че в оптималния случай изучаването на всяка кремъчна колекция следва да бъде насочено към реконструкция на производствената верига (*chaîne opératoire*) ... „от придобиването на суровината до изхвърлянето на оръдията, и да се разгледат въпроси относно техно-икономическата организация на придобиването на суровини и производството на сечива“ (Perlès, Papagiannaki 2022, 198). Как би могло това твърдение да се приложи към доставката, разпространението и употребата на BF?

Както вече беше отбелязано, доставката и разпространението на BF намалява през късния неолит. Трудно е да се проследи генезисът на този процес и всяко опростено обяснение би било спекулативно, тъй като и причините, и аргументите за радикалната промяна в социалната структура и материалната култура в средата на VI хил. пр.Хр. са неоднозначни и неизяснени. Съотношението между „специалните“ суровини (в смисъл

на предпочитани, често използвани и регулярно доставяне чрез трансрегионален обмен) и лесно достъпните местни суровини, използвани при експедиентното (*ad hoc*) производство, е променливо и информативно. Причината е, че при оценката на суровините не количествените показатели са най-съществени, а вложеното човешко усилие и сложността на вземане на решения в стратегията за добив и снабдяване със суровини.

Ние сме наясно с находищата на балкански флинт, но не знаем от кого и кога започва тяхната експлоатация за директна употреба, търговия и обмен. Имаме свидетелства за работилница при вторичното находище на балкански флинт при Жернов, с останки от добиване на конкреции и първичен дебитаж. Но не знаем дали в близост е имало селище с местни майстори по кремъчно производство, или пътуващи специалисти са посещавали работилницата за набавяне на суровини и оформяне на ядра – или (най-вероятно) и двете дейности са се извършвали едновременно. Работилниците при кремъчни находища биха могли да са специализирани единствено в добиването на конкреции и подготовката на ядра (и евентуално тяхната експлоатация), като по-късният етап – добиване на серии полуфабрикати (отломъци и пластини) и оформяне на инструменти – се извършва в други работилници, обикновено в самите селища или в близост до тях. Както беше обяснено, с изключение на Слатина с налични три ядра за пластини и значително количество термично деформирани артефакти, нямаме други документирани работилници *in situ*.

Ключов е въпросът кога системата за разпространение на балкански флинт започва да функционира и да обслужва първите земеделски общности в Северна България. Логично изглежда това да се е случило **преди** установяването на неолитните селища, тъй като те показват непълни, но добре представени фрагменти от производствена верига на тази суровина. Тази снабдителна мрежа е доставяла продукти от балкански флинт на всички раннонеолитни селища (поне тези, обсъждани тук). За потребителите в Северна България доставката е включвала ядра и дебитаж, докато за селищата в културния кръг Караново I–II тя по-вероятно е била фокусирана върху пластини и готови оръдия. Използвайки класификацията на движението на суровини, приложена в контекста на общностите с линейно-лентеста керамика (LBK), селищата в Северна България попадат в групата на производителите и междинните селища, докато тези в Южна България са предимно потребителски (с изключение на Слатина) (Kampf, Denis 2024). Ясно е, че диагностичните раннонеолитни оръдия от BF, представени от разнообразно ретуширани пластини, са подлагани на регулярно латерално преоформяне, което води до прогресивното им стесняване и е индикатор за недостиг на изделия от този флинт. Трудно е да се определи кога и защо тази снабдителна мрежа е престанала да функционира, тъй като повечето селища, в които се откриват диагностични оръдия от BF, нямат по-късни напластявания. Най-вероятно това не се дължи на достъпността на находищата (според хипотезата на И. Гацов), а на нов процес на вземане на решения, ориентиран към местни, лесно достъпни ресурси, следствие от по-дълбоки промени в социалната структура и организация. Селищната могила Караново е пример за последователно обитаване и фактът, че диагностичните оръдия от балкански флинт намаляват като количество, но продължават да се използват, показва симптоми на криза в снабдяването.

Регресът в раннонеолитната ойкумена по нашите земи (с много изоставени селища) и много новосъздадени в различна палеоекологична среда (вж. Boyadzhiev 2020, Grębska-Kulow 2017, 2024) неизбежно води до адаптации към новите обстоятелства и промени във вземането на решения по редица жизненоважни аспекти, включително снабдяването със суровини. По това време хората очевидно се насочват към експедиентното производ-

ство, базирано на по-лесното набавяне на суровини от налични местни източници (главно вторични находища) в сравнение с поддържането на снабдителната мрежа на балканския флинт. Моята хипотеза е, че обитателите на раннонеолитните селища с диагностични оръдия от BF и други негови дериватни продукти са пренесли тези артефакти със себе си при напускането на селищата около 5500 г. пр.Хр. Не е голямо усилие да се пренесат няколко килограма ценни артефакти, които да продължат да се използват на новите места на обитаване (като в Априлци, защо не и в Харманли) или на новите места за ритуални практики (като Сърнево, според интерпретацията на откривателите).

ТЕХНО–ТИПОЛОГИЧЕСКИ ХАРАКТЕРИСТИКИ В КОМПАРАТИВЕН АСПЕКТ (фиг. 145–148)

Неолитната кремъчна индустрия е белязана от две екстремни особености –макропластините през ранния неолит и микролитизацията през късния. Това е впечатляващ преход, който оказва влияние върху всички аспекти на техно-типологическите параметри на ансамблите. Производствената верига на макропластините периодично фокусира вниманието на специалисти върху кремъчните технологии, но си остава енигматична. Тук ще се фокусирам върху няколко момента (които вече бяха обсъждани в предишни публикации – Gurova 2008a, 135; Gurova 2012b, 18, 21). Когнитивно е стимулиращо, но нереалистично, да се очаква доказателство за директна връзка между макропластините от балкански филнт в България и някакъв „генетичен“ анатолийски контекст… не на последно място защото, както отбелязва Özdoğan, всяко сравнение между анатолийски и балкански ансамбли трябва да се прави „без да се преувеличава присъствието или отсъствието на селективни артефакти“ (Özdoğan 2006, 23). Различна концепция относно заемките и влиянията по време на неолитните миграции се изразява в противоположния подход – визиращ елементи, които НЕ са пренесени – и е аргументирана от C. Perlès (Perlès 2005).

Произходът на балканските макропластини е проблем, който живо е ангажирал вниманието на J.K. Kozłowski и е определен от него като „един от най-загадъчните въпроси на балканския керамичен неолит“ (Kozłowski 2007). Проблемът остава нерешен и е по-добре да се съсредоточим върху макропластините (един от „феномените“ на българския ранен неолит), които обезпечават изработката на диагностичните оръдия от BF. Производството на макропластини зависи от два основни фактора – подходяща суровина/кремък за оформяне на достатъчно големи ядра и майстори с достатъчни умения за поддържане на успешна система за експлоатация/редукция на ядрата. BF определено отговаря на тези изисквания, НО въпросът за идентичността на (пътуващите?) майстори на кремъчно производство или специалистите с „нови похвати и умения“(в смисъла на Chapman и Gaydarska, 2011) остава без еднозначен отговор.

След отделянето чрез индиректен удар (техника на удар с посредник), макропластините от балкански флинт продължават своята биография като използвани директно (главно като елементи за сърп), но с последващо ретуширане/заостряне или чрез оформяне на различни видове ретуширани оръдия. Ретушът на макропластините се извършва чрез натиск с рогов инструмент (ретушор). Освен тази оптимална методика са възможни различни видове инцидентен „ретуш“ – следи/негативи вследствие на употреба или тафономични въздействия, или интенционален ретуш с подръчен инструмент, или просто чрез притискане на ръба върху твърда повърхност. Моите макро- и микронаблюдения на множество серии ретуширани пластини от балкански флинт ясно показват многократни случаи на поправка/преоформяне на страничните ръбове. Най-ярките примери са елементите от

сърп. Първоначално са били използвани неретуширани пластини, подлежащи на систематично ретуширане на работните им ръбове. Така ръбовете постепенно се затъпяват, а ретушът върху тях преминава в по-висок и по-стръмен. В този смисъл тези диагностични оръдия притежават своеобразна технологична дихотомия – освен серии с интенционален и първоначално нанесен висок и стръмен ретуш, значителна част от тях вероятно са изначални елементи от сърп, подложени на регулярно преоформяне с утилитарна цел.

Съществен детайл, който следва да се уточни е, че сред раннонеолитните ансамбли от България няма доказателства за използване на отделяне на макропластини с помощта на т. нар. натиск с лост. От друга страна, техниката на натиск може да се отнесе към и е предпоставена от малките и микроядрата, които са често срещани в къснонеолитните колекции и представляват една от най-забележителните черти на микролитизацията. Нашите ансамбли предоставят (макар и редки) примери на малки пластини с индикативни технологични характеристики. Значително по-информативни са малките ядра и микроядрата в напреднала и последна фаза на използване. Те не са от конусовидния (т. нар. bullet – куршумен) тип, характерен за дебитажа с натиск в технокомплексите в Близкия изток и Анатолия. Нашите ядра имат различни форми, обикновено с равни (с различен наклон) ударни площадки и плоски (до леко изпъкнали) отломъчни повърхности с относително паралелни ръбове. Ширината на негативите от отделени пластини/пластинки предполага, че се прилагат методи на отделяне/дебитаж от 1 до 3 според класификацията на J. Pelegrin (Pelegrin 2012). Съществува конвенционално схващане, че отделянето на пластинки и стандартизацията им са необходимо условие за производството на геометрични микролити през мезолита и по-късните периоди на праисторията. В нашите серии геометрични микролити тази концепция е по-приложима за късния неолит (с множество микролити), отколкото на спорадично срещаните раннонеолитни такива.

Раннонеолитните микролити, въпреки оскъдността им, биха могли евентуално да компенсират липсата на класически върхове за стрели, които са характерни за предкерамичния и керамичен неолит в Близкия изток и Централна Анатолия, но липсват в Северозападна Анатолия и на Балканите. Типични върхове на стрели са непознати и сред раннонеолитните ансамбли в Гърция, поради което C. Perlès ги споменава сред „не-възприетите“ неолитни елементи. Геометричните микролити у нас се появяват отново през късния неолит с предполагаемата функция на върхове за метателно оръжие (стрели), като те са единствените известни „оръжейни” елементи сред местните неолитни групи.

В заключение може да се обобщи, че: геометричните микролити от неолитните пластове заслужават по-нататъшно изследване, което би хвърлило светлина върху множество технически детайли в диахронна перспектива. Променливостта в морфометричните параметри, ретушираните ръбове и общата форма (равнобедрени срещу разностранни трапеци) изисква детайлно техно-типологическо изследване, за да се открие общо know-how или поне тенденция в производството на микролити. Подробно изследване на базата на унифицирани критерии за описание, терминология и интерпретация би било значителен принос за изучаването на геометричните микролити в локален и надрегионален контекст.

Типологическите промени през късния неолит могат да се резюмират както следва:

- **Ранен неолит:** а) доминиране на ретуширани пластини, сред които най-представителни са диагностичните оръдия от балкански флинт (ретуширани пластини и елементи от сърп); б) вариативност в пропорциите на другите типологически групи, произтичаща от регионалните модели и спецификата на домашното специализирано производство (пример: микропробои/сведели в колекциите от Ковачево и Илинденци); в) явно предпо-

читание на висококачествения кремък (BF) за изработка на утилитарния инструментариум.

- **Късен неолит:** а) нарастваща роля и употреба на локалните суровини и ограничено търсене на BF; б) регрес в производството на макропластини и превес на дебитажа на отломъци с последваща трансформация в оръдия (главно стъргалки); в) голямо разнообразие на стъргалките както в типологически, така и в морфометричен план, с очевидно съкращаване на пропорциите и увеличаване на вариацията на формите; г) микролитизацията се представя чрез микроядра за пластини и пластинки и две категории ретуширани артефакти: малки (микро) стъргалки на отломъци (често полукръгли) и геометрични микролити *sensu stricto* (трапеци, полумесеци/сегменти и редки атипични форми).

ФУНКЦИОНАЛНИ ХАРАКТЕРИСТИКИ В ДИАХРОННА ПЕРСПЕКТИВА (фиг. 149–151)

Моята база данни за функционалните характеристики на артефактите от изследваните ансамбли е информативна за всяка конкретна колекция и това е представено в Част II на дисертационния труд. От друга страна, тя не предполага изчерпателно и надеждно диахронно сравнение между отделните ансамбли, най-малкото поради количествена неравнопоставеност на трасологически изследваните серии артефакти. Затова се фокусирам върху избрани категории инструменти, чиито функционален анализ смятам за най-надежден за интерпретация и коментар. Тези групи артефакти са: а) елементите от сърп – лесно разпознаваеми на макониво, като нито един артефакт не е пропуснат в анализа на следите от употреба; и б) геометричните микролити – поради малочислеността им и случайното/непредсказуемо появяване на различни етапи от неолитната секвенция, всички налични артефакти от проучените ансамбли са микроскопски анализирани. И двете категории изделия са свързани с основните аспекти на палеостопанството и се разглеждат като *„fossiles directeurs“*/диагностични находки в контекста на земеделието и лова.

Имаме два отлични примера за инструментариум, пряко свързан със специализиран тип производство – микропробои/свредели от Ковачево и Илинденци, чийто анализ тук е ограничен до втория обект (пример №4 в Част II) и е подпомогнат от експериментални изследвания върху техники на пробиване на минерални и органични материали (Gurova et al. 2013). По-подробен анализ и сравнение между двата инструментариума е необходимо, за да се установи дали тяхната роля в практикуваните занаяти достига ниво на ясно установена специализация.

Елементите от сърп се появяват в раннонеолитните кремъчни ансамбли напълно еволюирали и като интегрална част от неолитния пакет. Те присъстват в най-ранните пластове на Ковачево (преди културните влияния на Караново I). Присъстват и в Джулюница, но апогеят им несъмнено е по време на културата Караново I, където стават един от емблематичните ѝ атрибути. Елементите от сърп, открити в раннонеолитните обекти, са многобройни и показват морфо-типологическо разнообразие. Няма доказателства за морфометрична стандартизация – съставени са от неретуширани или ретуширани пластини с дължина 2–5 cm и ширина 1–3 cm. Сред оръдията с тази употреба преобладават ретушираните пластини. В абсолютна бройка елементите от сърп доминират в регистъра на оръдията със следи от употреба. Сред тях особена категория представляват елементите от сърп, направени от балкански флинт. Както беше споменато по-горе, те предполагат продължителна и интензивна употреба, водеща до забележимо диагонално излъскване по работните ръбове (Gurova 2005). Пластините с успоредно на ръбовете излъскване са изключително редки. Карановският тип сърп е широко признат като един от най-ефек-

тивните праисторически земеделски инструменти с произход от предкерамичния неолит в Плодородния полумесец, с много близки паралели в неолитния Хаджилар в Анатолия (Gurova 2008d). Сърпът тип Хаджилар е регистриран сред серии регулярни пластини с диагонално излъскване от жътва в изследваните от мен кремъчни колекции от раннонеолитните селища Илъпънар и Ментеше (в района на Мраморно море) (Gurova 2001; 2006; 2008b).

През късния неолит се използва същият тип сърп, въпреки коментираните промени в кремъчната индустрия. Кремъчните елементи от сърп остават най-важната категория сред използваните сечива. Повечето от тях (особено в многослойните могили с ясно проследима връзка с раннонеолитните пластове) са същите диагностични оръдия от BF, които се запазват като реликтови форми на раннонеолитния инструментариум. Друга категория са неретушираните пластини, които скоро след употребата се преоформят (*ergo* – ретушират). Неолитните сърпове могат да се идентифицират надеждно не само чрез типичните микроследи от употреба на кремъчните им елементи, но и чрез някои цели или фрагментирани дръжки от еленов рог на *Cervus elaphus*. За разлика от наблюденията при средиземноморските ансамбли с елементи от сърп, които показват темпорална трансформация от ъглово към успоредно на ръба излъскване (Mazzucco et al. 2020), сърповете в българските неолитни колекции остават с непроменимо косо закрепване на кремъчните елементи, предпоставяно от диагоналното излъскване и подсказващо традиционност и консерватизъм в техниката за прибиране на реколтата.

Вторият фокус, както беше споменато по-горе, е върху геометричните микролити, които се появяват както в ранно-, така и в късноеолитните колекции и се предполага, че са функционирали като напречни върхове за стрели поради липсата на типични върхове за стрели. Съществува дихотомия във функционалността на геометричните микролити: от една страна е антиципативното им предназначение за компоненти на метателно оръжие, което частично е реализирано чрез използването им като трансверсални върхове на стрели или елементи от съставни стрели с успоредно закрепени кремъчни зъбци, а от друга – те често съдържат следи от други функции, като елементи за сърпове и/или ножове за рязане на различни материали.

В заключение могат да се формулират няколко общи наблюдения за употребата на артефактите:

- типичните диагностични оръдия от BF индикират няколко етапа на функционална трансформация: а) начална употреба на неретуширани пластини като елементи от сърп с последващо преоформяне (с реликтово излъскване от зърнени култури по обновените странични ръбове) и накрая (след продължителна употреба и загуба на ефективност поради затъпяване на работните ръбове) – изхвърляне; б) друг биографичен цикъл включва изначално интенционален стръмен ретуш и използване на пластините за обработка на кожа и/или дърво като съставно оръдие („рукан“) с извита дръжка и надлъжно закрепена в центъра ѝ пластина – много ефективно изделие за стъргане на кожа и дърво, регистрирано в ансамблите от селищните могили Караново и Азмак (Gurova, Gatsov 2000). Значителна част от тесните стръмноретуширани пластини от диагностичния репертоар показват реликтови неоднозначни следи;

- повечето полифункционални оръдия са разнообразни ретуширани пластини (вкл. извън гореописаните). В някои случаи ретушът има утилитарен произход, който след преоформяне на оръдието вече се третира като оформящ – оттук възникват „разминаванията/несъответствията“ между конвенционалната типологическа класификация и микроскоп-

ското наблюдение, което е отчетено и от други изследователи (Perlès, Papagiannaki, 2022, 213);

- още по-явно е това несъответствие при стъргалките, чиято антиципативна функция е обработка на кожа, но *de facto* в повечето случаи (особено къснонеолитните стъргалки с малки размери) те остават неизползвани;

- някои операции, като обработка на дърво и кост/рог, са слабо представени, което е изненадващо поради богатата костна индустрия и широкото използване на дърво в бита – възможни обяснения са алтернативни инструменти, използвани за обработка на тези материали или трудности в трасологичната диагностика;

Резултатите от анализа на следите от употреба неизбежно поставят въпроса за корелацията между типологическите и функционалните характеристики на кремъчните артефакти; как може да се обясни разнообразието (в някои случаи разточително) в типологическия репертоар спрямо ограниченото утилитарно приложение на някои типове и какви са били приоритетите на производителите – вътре- и междуплеменни обменни практики, конкретни функционални нужди или обикновена представителност в случаи на суровинен дефицит? Тези въпроси, формулирани от мен преди години, все още очакват задоволително разрешение (Gurova 2006).

2. ДИСКУСИЯ И ЗАКЛЮЧЕНИЕ

Всеки от изследваните ансамбли/примери, представени в Част II, съдържа отделна дискусионна и заключителна част, тъй като всеки е уникален със своите споделени и индивидуални характеристики. Да се направи компилация на тези дискусии и заключения и да се представи тук в обобщен вид не било особено постижение. Затова аз ще завърша с някои мисли, които възникнаха у мен по време на продължителния изследователски процес, частично провокирани от амбицията ми да асимилирам нарастващия обем литература за неолитизацията…

Да припомним концепцията на M. Özdoğan, че „процесът на неолитизация е сложен феномен, толкова многоаспектен, че нито един модел не би бил достатъчен на надрегионално ниво“. В този процес всяка обособена зона може да се разглежда като „ядро“ за следващите по посоката на придвижване. Така съществуват множество движещи се „ядра“ (Özdoğan 2011a, 31). Моят въпрос тук е била ли е отредена на нашите земи роля на „ядро“, в какъв аспект и на кой етап от неолитизационния процес? Аз имам и положителен отговор на този въпрос и той е (най-малкото) в сферата на снабдяването и разпространението на балкански флинт от находищата в Северна България към заобикалящата мезо-неолитна ойкумена на Балканите на границата между VII и VI хил. пр.Хр.

Какви истории ми разказаха кремъчните ансамбли по време на изследването? Ще се опитам да бъда кратка и максимално информативна. Има два раннонеолитни обекта в България, които на този етап от научното познание и по налични хронологични данни (надеждни ^{14}C дати) могат да се считат за най-ранните земеделски селища – Ковачево в средното течение на Струма и Джулюница в Централна Северна България, на малък приток на р. Янтра. Както ясно беше посочено по-горе, Ковачево несъмнено е свързано с една от най-ранните миграционни вълни, достигнали територията на България. Селището демонстрира значително културно развитие от самото начало на неолитната си секвенция (фаза Ia), както и след включването му в културния комплекс Караново I по време на периодите Ic–Id, когато на обекта се появява балканският флинт. Следователно

ролята на Ковачево в създаването и началното функциониране на снабдителната мрежа на BF е нулева. Неговата евентуална роля като „ядро“ може да се предвижда в сложните взаимодействия със селищата в Пелагония и в Северна Гърция, както и с тези на север по долината на Струма (Grębska-Kulow 2024).

От друга страна, Джулюница, с впечатляващото производство на пластини от балкански флинт и удобно разположение между двата клъстера на находища на BF (Плевен–Никопол и Шумен), може лесно да се разглежда като „ядро“ за разпространението на полуфабрикати от балкански флинт като следваща стъпка след добива на кремъчните конкреции от находищата, осъществен от специализирани групи, занимаващи се с първичното снабдяване с балкански флинт и последващата търговия/обмен. Кремъчните майстори от Джулюница очевидно са притежавали необходимото знание и сръчност за успешно отделяне на пластини. Въпросът е откъде са дошли тези майстори? Възможностите не са много: най-близкото (географски) място е регионът на Железни врата, откъдето специализираните групи са достигнали находищата на балкански флинт от Плевен-Никополския клъстер и са можели да ги експлоатират още преди основаването на селището Джулюница; друга възможност, според теорията за субсредиземноморско-егейските миграционни импулси, предполага отклонение на част от мигриращи на север по Вардар и Струма групи и придвижването им към Дунавската равнина. В този сценарий първите обитатели на обекта е следвали бързо да предприемат експедиции за снабдяване със суровини.

Според мен най-добре съответства на обстоятелствата и доказателствата за предкарановския анклав в Северна България (с група селища: Джулюница, Копривец, Поляница, Орловец, Самоводене) хипотезата за разпространение на ранноземеделски общности от Северозападна Анатолия (вкл. Мраморно море) по (сега потопеното) Черноморско крайбрежие, достигайки накрая Лудогорското плато (Özdoğan 2006; 2011a–b). Цитирам J. Рооденберг: „Резултати от радиовъглеродните дати и ДНК анализите ясно показват, че от средата на VII хил. Северозападна Анатолия не трябва да се възприема като задънена улица (cul-de-sac), а като път, използван от мигриращи земеделци“ (Roodenberg 2016, 4).

Разбира се, не е изключено Джулюница да е била регулярно посещавана от пътуващи майстори, обезпечаващи я с кремъчни продукти. Този вариант кореспондира с виртуалния сценарий за преднеолитни/мезолитни групи, вече ангажирани с мрежата за снабдяване и дистрибуция на балкански флинт, вкл. и с подготовката на ядра – т.е. практикуващи началните етапи на производствената верига на балканския флинт.

Друга насока на моите мисли в дискусионен ракурс ...

По време на дългогодишното ми изследване на неолитни колекции се опитвах да прилагам многопластов подход чрез съчетаването на техно-типологически и функционален анализ. Първият е най-традиционният, конвенционален и масово използван в изследването на кремъчни индустрии – позволява да се разкрият техните характеристики и да се използват за сравнителен (синхронен и диахронен) анализ. За формален преглед на колекциите такъв подход е приложим и дори задоволителен. Технологичните и типологически белези са относително добре дефинирани и позволяват гъвкаво приложение. Огромната литература за кремъчни индустрии по света се базира и ще продължи да се базира на този методологичен и интерпретативен подход.

Ключово предимство е подходът чрез анализ на следите от употреба, който разкрива функциите на артефактите и позволява идентифициране на конкретни инструментариуми, повдигащи завесата към реалните ежедневни и основните стопански дейности на

човешките групи. Функционалните конотации на артефактите нямат за цел създаване на допълнителна (често объркваща) функционална типология, която неизбежно ще се сблъска с конвенционалната такава, базирана на серия от общи характеристики, резултат от оформяне на полуфабрикатите в оръдия и последващото им преоформяне. Функцията на артефактите дава ново възприятие за кремъчните изделия, постепенно обогатявайки разбирането ни за тях.

Моят опит показва, че понякога дори започването с прост „етикет“ в специализираната литература – например „балкански кремък“ – и опитът да се подходи научно чрез съответни аналитични процедури може сам по себе си да стане път за реален научен напредък. В този смисъл най-важната част от изследването ми са анализите, резултатите и съответните интерпретации, до които нашият екип достигна в проучването на балканския флинт, превръщайки го от неясна фикция в реален (и неизбежен) фактор в дебата за неолитизацията, с което се поставя край на ерата на сценарии и парадигми, основани главно на керамичните комплекси.

Всички аспекти на BF поставят нови въпроси и отварят поле за по-специализирано изследване, което надхвърля описанието и идентификацията на находищата. Неговата мрежа преди и по време на балканската неолитизация е от ключово значение. Резултатите от изследванията през последното десетилетие предоставят нови доказателства за неолитизацията на Източните Балкани и ролята на кремъчните суровини (особено BF) в разпространението на земеделието.

Ако се фокусираме върху Балканите, всички въпроси за BF (раздел 2.3 от монографията) показват, че нито един от конвенционалните сценарии за неолитизацията на България не е приложим, без да се вземат предвид находищата на BF и тяхната достъпност за първите неолитни заселници. Повтарянето на репертоара от диагностични оръдия от BF на голяма територия и симбиозата му с други характерни социално-културни белези през първата половина на VI хил. пр.Хр. предполага съществуването на сложна обменна мрежа с висока степен на интегритет и взаимодействие, част от елементите на която са все още невидими и изискват детайлни систематични изследвания.

Накрая припомням важните научни въпроси, очакващи задоволително решение:

- Дали всички образци и артефакти от балкански флинт, регистрирани сред раннонеолитните ансамбли в Югоизточна Европа, произхождат от известните находища в Северна България? За разрешаването на този въпрос са нужни повече специализирани геологически проучвания в съседните балкански страни;

- Кога и как е възникнала мрежата за снабдяване и дистрибуция/обмен на балкански флинт?;

- Съществували ли са късномезолитни общности по Долния Дунав, които вече са експлоатирали находищата на балкански флинт в Северна България и са споделили това know-how с първите земеделски групи?;

- Или първите заселници-земеделци, достигнали до Северна България, сами са „открили“ находищата на балкански флинт?;

- Откъде са дошли първите земеделци? Кой от различните сценарии (основно базирани на изследвания на керамика от XX в.) е най-добре подкрепен от наличните радиовъглеродни данни и как новите проучвания върху балканския флинт ще рефлектират върху дискурса?;

- Как добиването и употребата на балканския флинт се вписва в традиционната кон-

цепция за неолитния пакет (съществуващ от началото на култура Караново I) и от коя предкарановска общност той е въведен?

Изброените въпроси трябва да се осмислят от балканските праисторици, тъй като тяхното разрешаване ще изисква общи усилия и сериозни аналитични изследвания на балкански флинт от учени във всички балкански страни. България е богата на висококачествени суровини, използвани в праисторията, но страната е още по-богата на ансамбли, съдържащи разнообразни суровини в множество конфигурации и разказващи различни истории за хората, които ги са използвали. Трябва да можем точно да „прочетем“ тези истории, преди да ги включим в личните ни наративи.

DOCENDO DISCIMUS!



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Maria Gurova is an internationally acclaimed scholar, recognized for her research on Holocene flint assemblages from Bulgaria, the Balkans, Anatolia, and the Levant. Her research integrates traditional techno-typological analysis of flint artefacts with functional use-wear identification – a discipline in which she was a pioneer and remains the sole expert within the Balkan prehistoric academic community. Through her fellowships at academic institutions abroad (France, The Netherlands, Israel) and annual participation in international scientific fora, Maria Gurova has become a valued collaborator in international scientific programmes and projects. Her research addresses Neolithization, Chalcolithic flint industry technological achievements, Metal Age flint toolkits, functional analysis of flint artefacts, flint raw material sourcing and distribution networks, among others. She has authored over 280 scientific publications, some of which are in prestigious, high-impact journals. For the past 15 years, she has served as editor-in-chief of the Bulgarian e-Journal of Archaeology (Be-JA), Bulgaria's only archaeological journal indexed in the Web of Science Core Collection (Clarivate Analytics).