

Towards an understanding of Early Neolithic populations: a flint perspective from Bulgaria

Maria Gurova

National Institute of Archaeology and Museum, Bulgarian Academy of Sciences, Bulgaria
gurovam@yahoo.fr

ABSTRACT – *The evidence from the Bulgarian Early Neolithic chipped stone industry reveals coherent and diagnostic flint assemblages for the vast Karanovo I and II cultural area, characterized by high quality yellow-honey coloured flint, quite long and regular blades, with (bi)lateral semi-abrupt high retouch and sometimes with rounded or pointed ends, as well as highly (re-)used sickle inserts. These assemblages possess many characteristics of so-called ‘formal tools’ (as distinct from expedient ones), the production of which required a special raw material, advanced preparation, anticipated use, and transportability. The wide geographical distribution and circulation of this formal toolkit implies that lithics could be conceived as a factor in identity and social cohesion, and as an important aspect of the Neolithic mentality for ‘doing things’.*

IZVLEČEK – *Bolgarski zgodnjeneolitski zbiri kamnitih orodij kažejo koherentno sliko diagnostičnih tipov, značilnih za kulture Karanovo I in II. Značilna je uporaba visoko kakovostnega kremena rumeno-medene barve, dolge in pravilne kline z (bi)lateralno polstrmo retušo, občasno zaobljene konicice in preuporabo armature za srpe. Ti zbiri kažejo značilnosti ‘formalnih orodij’ (za razliko od ad hoc orodij); za njihovo proizvodnjo so potrebne posebne surovine, zahtevna priprava, načrtna uporaba in prenosljivost. Veliko geografsko območje kroženja teh formalnih orodij kaže, da lahko kamnita orodja razumemo kot element identitete, družbene kohezije in pomemben vidik neolitskega pristopa k ‘delanju stvari’.*

KEY WORDS – *Early Neolithic; formal flint toolkit; diagnostic tool; big retouched blades; raw material; Balkan flint; functional analysis*

“Archaeologists can only study the past by means of surviving material, and it is perhaps understandable that the primary archaeological concern has been to explain the creation of the archaeological record by reference to past human actions.”

J. Barrett

Introduction

The richness of Bulgarian Neolithic culture, with the paraphernalia of its artistic representations and deep semantic connotations, is well known and still vividly interpreted and debated. This paper discusses a kind of material not often considered in this context – flint assemblages – being far less attractive in embodied depictions and cognitive suggestions.

In terms of the traditional distinction between different theoretical approaches in archaeology, Bulga-

rian archaeology has tended to follow the conventional culture-historical paradigm which focuses on placing archaeological material... *“in time and space, [guiding] archaeologists in their successful development of archaeological sequences ... and [grouping] related materials into ‘cultures’ with clear spatial and temporal boundaries”* (Renfrew and Bahn 2005:213). There have been no systematic attempts to apply some challenging and relevant processual/post-processual explanatory or interpretive models.

In this sense the level of enquiry and knowledge is based more on the 'what, where, when' questions, than on the 'how and why' (*ibid.* 214). This could be regarded as a retrograde (or at least old-fashioned) style of pursuing archaeological research; at the same time, the lack of cognitive conceptualism has protected Bulgarian archaeology from excessive theoretical proxies, rhetorical speeches, and improvable scenarios. This protective effect could be seen as a positive consequence of the dominant research orthodoxy.

Whatever the advantages or disadvantages of existing approaches to archaeological research in Bulgaria, there is undoubtedly a poverty of language, terminology and connotations, which would otherwise permit recent archaeological studies to be appreciated and evaluated without ideological and epistemological scepticism from the wider scientific community. Notions and concepts such as 'identity, artefact biography (together with the functional and symbolic meaning of the artefacts), deliberate fragmentation, enchainment and accumulation, (in-)dividual personhood, social interactions, cultural adaptation and transformation, symbolic metaphors', etc., unfortunately are not yet in sufficiently frequent or adequate use. An exception is the study of flint industries, where the postulate of a '*chaîne opératoire*' is (unavoidably!) appropriated, but usually quite marginally and superficially applied and presented. Other exceptions are the studies by scholars such as D. Bailey, J. Chapman and, more recently, B. Gaydarska, which have introduced new epistemological and explanatory aspects to the interpretation of the material culture of the Balkan Neolithic and Chalcolithic periods (Bailey 2000; 2005; Chapman 2000; Chapman and Gaydarska 2007).

Concerning the Neolithic period, very few general and fundamental studies have been published (Todorova and Vaisov 1993); instead, there is a preponderance of specialized studies of different aspects

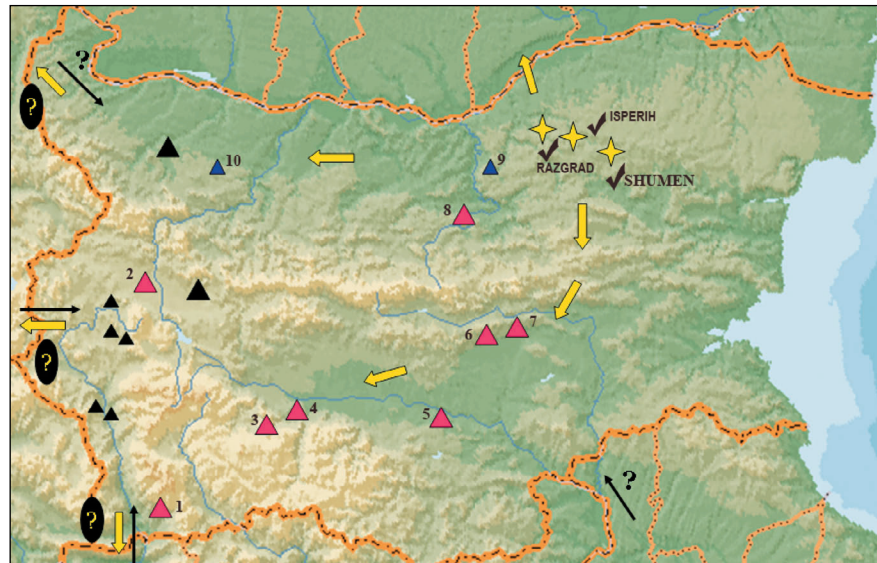


Fig. 1. Map with Early Neolithic sites: black symbol – western group studied by I. Gatsov; red symbol – study and direct observation of the author; blue symbol – ‘monochrome pottery’ sites. The three main flint outcrops are indicated by yellow signs in relation to modern cities. Arrows indicate presumed directions of: spread of Neolithisation – black; distribution of Dobrudzha flint – yellow. Numbered sites: 1 – Kovačevo; 2 – Slatina; 3 – Rakitovo; 4 – Kapitan Dimitriev; 5 – Yabalkovo; 6 – Azmak; 7 – Karanovo; 8 – Dzhuljunitsa; 9 – Koprivets; 10 – Ohoden.

of material culture and spirituality, almost exclusively of pottery (Nikolov 1998; 2006; 2007). Ceramic vessel ornamentation and the variability of sculptured objects (especially figurines), being particular artistic depictions of the human mind and imagery in the past, have unavoidably focused the attention of scholars on the search for the paraphernalia of (in-)dividual ability, mentality and behaviour of Neolithic people.

Another way of approaching the mind of Neolithic society involves a more 'prosaic' interpretation of subsistence and household activities, skill and technology, toolkit style and evolution (in terms of retardation, innovation and standardization) decision making, resilience and revival of technology and behavioural strategy, etc. The study of flint assemblages is an intrinsic part of this alternative research direction, and the present paper tries to improve the interpretive scope of flint toolkits in relation to the perpetual debate about the Neolithisation process and its emphasis on social agency (with particular reference to Bulgaria, but with some indispensable references to adjacent regions).

Current problems and research objectives

The focus of this study is the diagnostic flint toolkits which form an intrinsic part of the Early Neolithic

assemblages of the Karanovo I and II cultures. Apart from their distinctive techno-typological and functional features, another key feature is the special raw material from which the toolkits are made: high quality, yellow-honey coloured flint, with sporadic whitish spots (well known and often referred to in the literature as Balkan Platform flint). The complex of significant traits of these toolkits permits them to be conceived as one of the diagnostic elements of Early Neolithic material culture (Gurova 2005).

Typologically, these toolkits consist mostly of medium to long, regularly-shaped blades, ranging between 12 and 15cm long, frequently with (bi-)lateral semi-abrupt retouch (from marginal to high and steep), and sometimes with rounded or pointed ends. Most of the artefacts in these toolkits possess macro- and micro-wear traces of use. The flint assemblages reveal many characteristics of so-called ‘formal tools’, whose production requires “... a special raw material, advanced preparation, anticipated use and transportability” (Andrejski 1994:22). From a technological point of view, this industry indicates the application of indirect percussion (punch technique). Pressure flaking with an organic stick is used for the characteristic high and steep retouching. It must be stressed that neither cores nor common debitage linked with their preparation are attested among the assemblages. In this sense, any attempt to apply some diacritic concept of ‘*chaîne opératoire*’ reconstruction of the toolkits fails.

These formal tools are recorded in varying density and quantity among the flint assemblages of many Early Neolithic settlements, some of which had short

life-spans, and others reveal only limited archaeological evidence. Only a few sites offer the possibility of studying the formal tools in conditions of changing contextual data. For example, Tell Karanovo, with its representative cultural sequence from Early Neolithic to Bronze Age, provides a rare opportunity to trace the development and evolution of flint assemblages belonging to different strata. The observation made is that formal tools as elements of the typological repertoire are frequently attested from the Karanovo I to Karanovo II-III periods. During Karanovo III and even in Karanovo III-IV they appear sporadically as reminiscent forms (Gurova 2002; 2004). In the new periodization of the Karanovo sequence, periods III and III-IV belong to the first stage of the Late Neolithic (Nikolov 1998:18). To date, no other well-stratified site permits observations regarding the ‘evolution’ of formal toolkits.

In spite of the fact that an impressive corpus of flint studies has been done over the last two decades, too many questions still arise with regard to these flint toolkits: tracing their (becoming mythologically over-exposed!) raw material, its outcrops and procurement strategy; the location of their workshops, identification of their manufacturers (flint knappers) and technological origin; the identification of their distribution and exchange network mechanisms; elucidating their interactions and impacts with adjacent Early Neolithic cultural groups and identities, etc. Undoubtedly, this article, will not find satisfactory answers to all these questions, but will try to present and offer relevant comments on the current state of research and, without offering an attractive new scenario, will suggest that there are still key problems concerning the perpetual debate on the Neolithisation of the Balkans.

In order to make visible and understandable some of the features of the formal toolkits, colour photographs of the artefacts are presented, mainly to highlight the distinctive appearance of the high quality yellow-waxy-honey flint from north Bulgaria.

Chronological and spatial limits of the formal toolkits

As a first step it is useful to outline the chronological framework of the Early Neolithic in Bulgaria,



Fig. 2. Formal toolkit from Kovačevo (photo M. Gurova).

with some comments on the sites concerned. The Early Neolithic can be divided into two phases (*Bojadziev 1995: 179*):

- Early pottery ('monochrome' phase) - 6300/6200-6000/ 5900 calBC;
- Early ('classical' phase) - 6000/5900- 5500/5450 calBC.

The earliest ^{14}C date from Polianitsa-Platoto - 6420-6230 calBC (*Görsdorf and Bojadziev 1996:122*) - is not taken into consideration, since there is no published evidence from the site directly relating to the problem under discussion.

Apart from the relatively new dates from Kovačevo, the very promising Yabalkovo site (^{14}C dates not yet published) could refine the dating of the start of the 'classical' Early Neolithic period. Kovačevo has two early dates of 6159-5926 calBC and 6064-5808 calBC, and a cluster of three dates *c.* 5980-5730 calBC (*Lichardus-Itten et al. 2006:85*).

Two sites belonging to the monochrome phase of the Neolithic are briefly discussed below, and it is worth mentioning their dating. Ohoden (northwest Bulgaria), although sometimes attributed to the monochrome phase, dates to the beginning of the VI millennium BC (*Ganetsovski 2008*).

Some dates from Dzhuljunitsa (north central Bulgaria), according to the excavator, fall in the last three centuries of the VII millennium BC¹. The pottery features confirm the attribution of the site to the earliest Neolithic in Bulgaria (*Elenski 2004; 2007*).



Fig. 3. Formal toolkit from Yabalkovo (photo M. Gurova).

With regard to the time span of the toolkits under discussion and their function, it is useful to point out that they are abundant during the whole 'classical' Early Neolithic Karanovo I and II periods of the Tell Karanovo sequence, or until *c.* 5500 calBC. On the other hand, in terms of their lasting 'retardation' in the same sequence, the end of the Karanovo III period at Tell Karanovo: 5500-5280 calBC (*Görsdorf 1997:379*) can be regarded as a *terminus ante quem* for the presence of formal toolkits.

Spatial distribution of the formal toolkits

Local distribution

The formal toolkits are commonly found in the vast area of the Karanovo I and II cultures and their constituent regions in southern Bulgaria: Thrace - Tells Azmak, Karanovo and Kapitan Dimitriev, and the Yabalkovo site; the northern foothills of the Rhodopes Mountains - the Rakitovo site, Sofia Plain - Slatina; and Struma Valley - Kovačevo (Fig. 1). The map shows sites in western Bulgaria which have been published, albeit briefly, by Ivan Gatsov (black symbols). Other research has been undertaken by the author, and some of this work is still in progress (red symbols). In north Bulgaria the flint industry exhibits a very different pattern (exclusively expedient in character, and an absence of the formal tools under discussion here), despite the fact that a proportion of the artefacts were made using the same raw material as used for manufacturing the formal tools discussed. Two sites belonging to the 'monochrome' phase of the Early Neolithic sequence are marked in blue, in recognition of their important position in the context of the Neolithisation debate (*see below*).

Supra-regional distribution

Formal toolkits as a distinguishable category of the Early Neolithic flint repertoire have never before been discussed in the literature in their complex technological and social dimensions. Nevertheless, some aspects of their stylistic 'coherence' have often been observed in the course of work on different assemblages from adjacent major cultural areas - Proto-Sesklo, Starčevo, Körös-Criş. The most common feature mentioned in these studies is the presence of raw material from the Pre-Balkan platform among the Early Neolithic assemblages from the Balkans.

¹ Personal communication by N. Elenski with confirmation of forthcoming publication of ^{14}C dates.

According to Catherine Perlès, a characteristic feature of the chipped-stone assemblages of Neolithic Greece is the “predominant use of non-local raw materials often obtained from considerable distances” (Perlès 2001:201). She claims that... “honey flint was never worked in the settlements, and the number of imported blades in each assemblage – often less than a dozen – was too small to warrant expeditions to the sources” (*ibid.* 207). Perlès further observes that ‘sickle blades’ were the dominant ‘typological’ (formal) tools in Early Neolithic assemblages, and that... “Larger, heavier ‘sickle-blades’ of honey or yellow flints were imported and always as blades rather than cores. They were produced by indirect percussion and also pressure-flaking. The origin of these blades is still unknown: the west coast is the most likely candidate, but the quarries have still to be found” (*ibid.* 202).

Unfortunately, there is no up-to-date data base that would permit comparison with the chipped-stone industries from Nea-Nikomedeia and Gianitsa in Greek Macedonia. Recently, interesting and promising research has been done by G. Philippakis on north Greek Neolithic assemblages coming from outside the obsidian area. I hope our further study and collaboration will lead to positive issues of reliable comparison of the assemblages from both regions – Bulgarian Thrace and Greek Macedonia.

From the Ovče Pole region the crucial culture group of Anzabegovo-Vršnik is very promising, but still enigmatic from a lithic point of view. The affinities of this group are uncertain, and will only be revealed when comparative studies are possible. The material from Anza was studied by E. Elster, but there is no strictly stratified approach to the assemblages, and consideration of the chronological sequence is rather complicated. However, Elster mentioned that among the implements was “honey-brown flint, appearing to be similar to well known eastern European flint with no known local source” (Elster 1977:161).

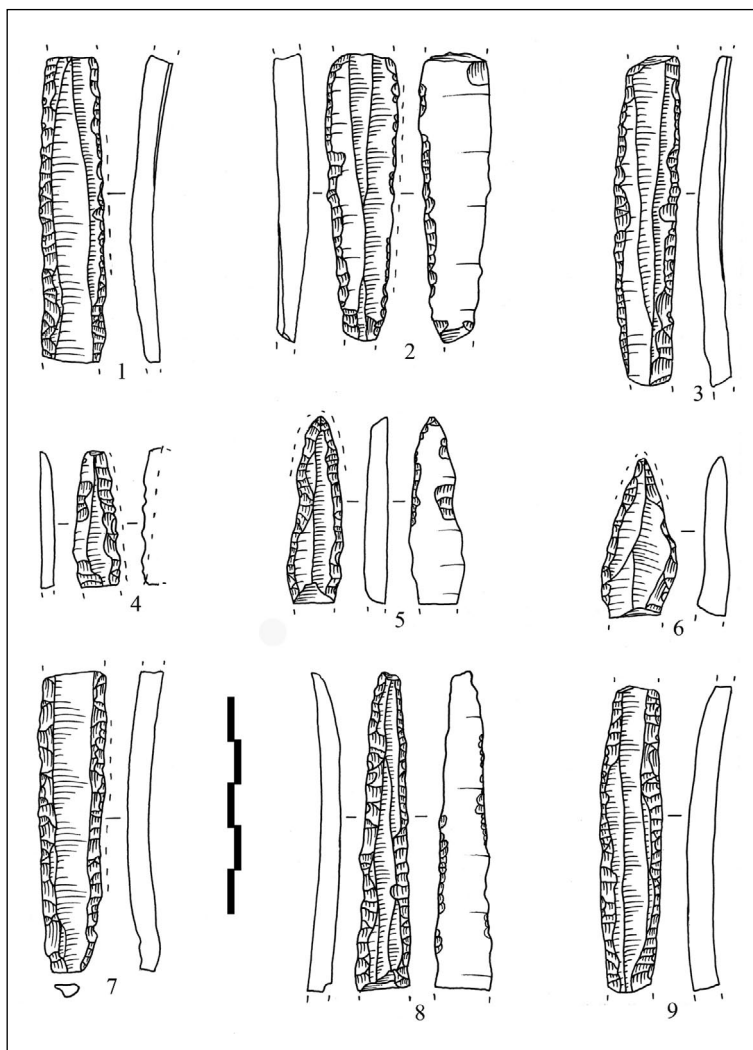


Fig. 4. *Typological characteristics of the toolkit from Yabalkovo (drawing M. Gurova).*

The Iron Gates region will be briefly discussed on the basis of Borić’s new interpretation of the succession of sites, cultural phenomena and problems in this area. The conformity of Early Neolithic Balkan flint assemblages in terms of the relative abundance and uniformity of their raw material was underlined a decade ago, with the intention of putting into comparative perspective the studies of Vlasac and Lepenski Vir, undertaken by Kozłowski and Kozłowski (Borić 1999). Concerning the flint assemblage of Lepenski Vir (potentially a key site for clarifying many aspects of the transition from the local Mesolithic to the Neolithic), clear stratigraphic ambiguities are documented, which probably explain the fact that Balkan flint was found ‘associated’ with the architectural features of Lepenski Vir I and II (Mesolithic strata) (Borić 1999:53). An assessment of the later, Neolithic lithics is presented by Borić as follows: “With the start of the Neolithic in the Balkans, there is a general trend toward the laminarization of blades

and the use of steep retouch, as well as a tendency to use good quality raw material of attractive appearance, such as yellow-spotted flint from pre-Balkan platform that most likely originated in the region of Shumen in north-east Bulgaria” (Borić 2005.19). It is worth mentioning two hoards of blanks and cores made from Balkan flint placed in Early Neolithic pots (according to Srejović 1969; 1972) and a nodule refitted with a retouched blade made of Balkan flint from sector I at Padina (Borić 1999. 54). These can be regarded as evidence of exchange practices among the Iron Gates communities. Hopefully, new excavations at Vlasac will produce reliable evidence and will extend the study of Early Neolithic flint assemblages to the larger supra-regional scale. It should be stressed that in chronological terms the transition between Mesolithic and Neolithic-type diets “... centred around... 6156–5721 calBC, and that agriculture was being practised in the Lepenski Vir – Vlasac area by...c. 5700 calBC” (Bonsall et al. 2000.130).

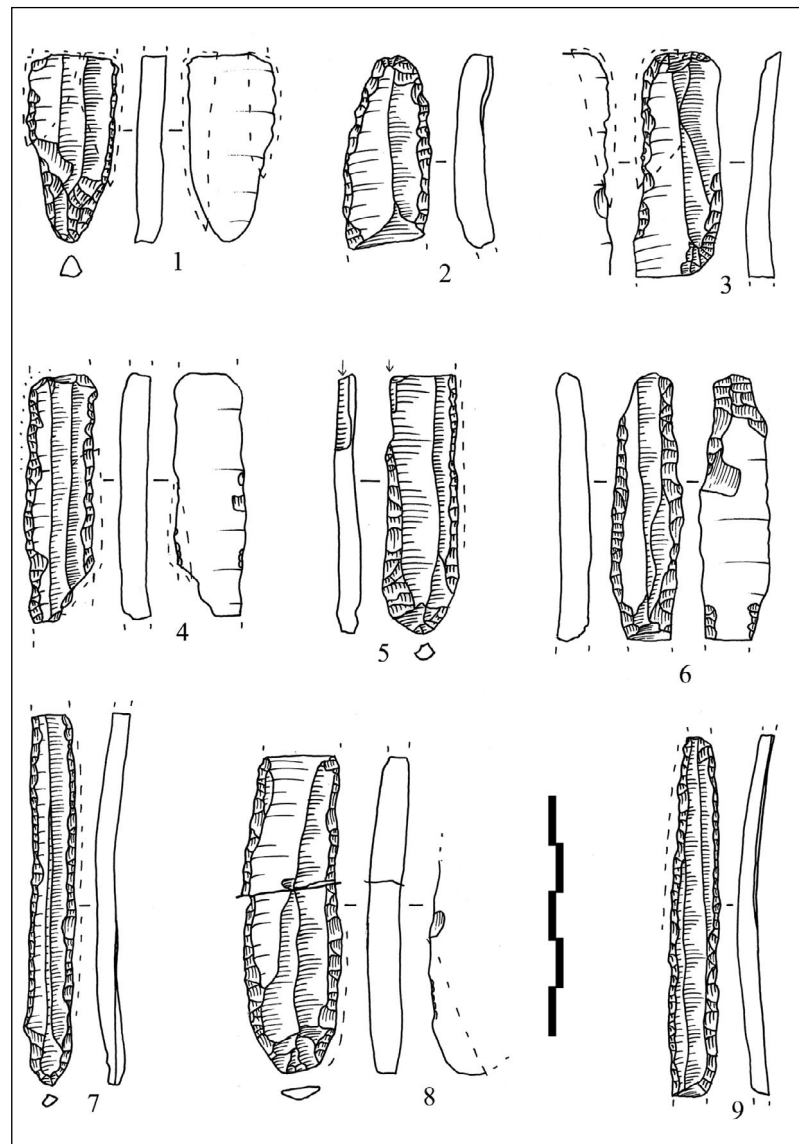


Fig. 5. Typological characteristics of the toolkit from Yabalkovo (drawing M. Gurova).

According to J. Kozłowski, the ‘tardif’ phase of Golocut (Voyvodina) offers some dozen implements of yellow flint from the Pre-Balkan platform; the drawings of some implements from the site confirm the typological similarity with the formal tools discussed in this paper (Kozłowski 1982.150; Figs. 11, 12). The same author concludes that in the area of the Körös-Criş culture there are retouched blades and unretouched sickle segments made of yellow imported flint – as a result of direct diffusion from the Balkans (Kozłowski 1982.154).

In the southeast there is undeniable evidence of the penetration of formal tools of Karanovo I aspect in Hoca Çeşme phase II (Gatsov 2000; 2005).

Comparative evidence from Romanian Early Neolithic flint assemblages is very limited and the distribution of ‘yellow-spotted’ raw material and items in

this direction is still to be adequately documented, although Bonsall has reported the presence of Balkan flint artefacts in Criş culture contexts at Schela Cladovei on the left bank of the Danube, a few kilometres downstream from the Iron Gates gorge (Bonsall 2003; 2008).

As a concluding remark, it should be stressed that no special study elucidating the scale and intensity of the circulation and spread of yellow-spotted flint artefacts has been undertaken. The reasons are many, the most important being the scarcity of publications with relevant and detailed information about Early Neolithic flint assemblages among which these formal toolkits are detectable. This applies particularly to some emblematic sites adjacent to Bulgarian lands and cultural areas.

Present state of research on discussed assemblages

In the early 1990s, a study of the Neolithic chipped-stone industry of western Bulgaria was published by I. Gatsov, with the following general observations and conclusions (these are quoted directly because of the important further comments that are derived from them):

- During the Early Neolithic a highly developed technology of macroblade production took place; the exploitation of cores (mainly single-platform) “took place sometimes outside the settlement’s area” (Gatsov 1993:40);
- This technology “was connected with the exploitation of high quality yellow (or wax-coloured) flint with white or grey spots”;...“Early Neolithic groups were able to exploit raw material sources which were very distant from their settlements”; ...“typical macroblades, especially made from yellow flint, were obtained either by exchanging goods or during special trips to the area of location of yellow flint outcrops, most probably in North-West Bulgaria” (ibid. 40–41);
- “...in the quarry areas, in the workshops, these groups (of manufacturers) had the possibility to ‘waste’ the material, selecting only standardized macroblades. Consequently, in the area of their settlements, the population was forced to conform to the restrictions caused by distant sources of raw material” (ibid. 44);

- Part of the macroblades were treated with high, semi-abrupt retouch on one or both sides (ibid. 45).

Essentially, Gatsov’s observations contain all the elements necessary for distinguishing the formal toolkit, but he stopped short of doing so, perhaps because of scarce empirical data, or simply because at that time it was probably beyond the scope of his research. In his study he presents five Early Neolithic flint assemblages from sites belonging to the southwest variant of the Karanovo I culture: Slatina, Eleshnitsa, Rakitovo, Sapareva Bania, Kovačevo (Nikolov 1996). The sites of Galabnik, Pernik and Gradshnitsa show an affinity in pottery style with the Karanovo I and II cultures, but instead are interpreted as belonging to the culture of west Bulgarian painted pottery (Todorova, Vaisov 1993:98). Later, Gatsov continued his study of Neolithic assemblages from Bulgaria, Turkish Trace and northwest Anatolia, with a particular emphasis on tracing the roots of Neolithic industries (e.g. Gatsov 2001; 2006; Özdoğan and Gatsov 1998; Gatsov and Gurova 1998). An important aspect of the study was undertaken in collaboration with a geologist, with the aim of defining the raw materials of Karanovo I and II assemblages and tentatively identifying their outcrops (Gatsov and Kurčatov 1997, see below).

Over the last decade the present author has carried out a study (focusing on use-wear analysis) of the main (Early) Neolithic sites in Bulgaria: the Karanovo, Azmak, and Kapitan Dimitriev tells, and sites at Kovačevo, Rakitovo, Yabalkovo, Slatina, Dzhuljunitsa – the study of the latter three is still in progress (Gurova 1997; 2001a; 2002; 2004). The flint assemblages from two early farming sites in the Marmara region have also been included: Ilipinar and Menteşe (Gurova 2001b; 2006). The results of these studies lead the author to conclude that among all Early Neolithic flint assemblages belonging to the sites of the Karanovo I and II cultural area, there is a distinguishable part of the typological repertoire, consisting of several formal tools, which suggests they should be conceived as diagnostic tool-markers (Gurova 2005). A diachronic analysis of the most representative sequence from

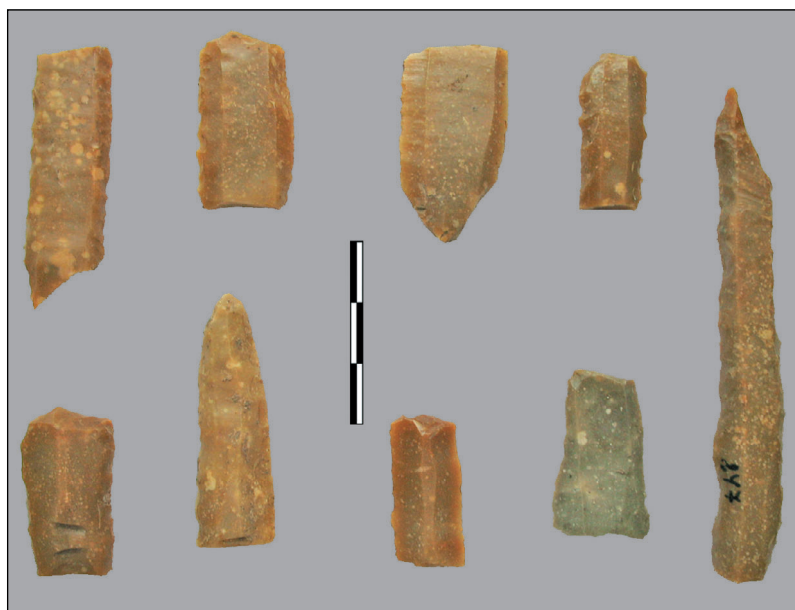


Fig. 6. Formal toolkit from Rakitovo (photo M. Gurova).

Tell Karanovo enabled the maximum time span of their currency among the flint assemblages of later Neolithic periods/phases to be established (Gurova 2004, see above).

It is worth mentioning briefly some of the sites I consider to be very promising for trying to answer the questions formulated above concerning the formal toolkits. According to the Kovačevo excavation team, it appears that “...stratigraphical and stylistic evidence from Kovačevo clearly shows that this region was occupied at a period earlier than the currently known for the Thracian Early Neolithic Karanovo culture”...“If ever there were direct contacts between Kovačevo and Karanovo I in Bulgarian Thrace, they must only have taken place, judging from the pottery styles, in a late period.” (Kovačevo Id) (Lichardus-Itten et al. 2006:87). This general conclusion is supported by my own observations on the evolution of the lithics: the Kovačevo sequence starts with a rich repertoire of artefacts that are made from mainly grey to black raw material that originates from the Western Rhodopes. In the upper levels of the Kovačevo I sequence (Ic and Id), a representative presence of the discussed flint toolkit is documented (Fig. 2)². This site, on the basis of detailed stratigraphic indications leading to reliable units, will permit us to establish the precise stratigraphic position/relationship between these tools and other cultural indicators, such as white-on-red painted pottery, or some another still invisible marker.

Another site where these toolkits are very prominent is Yabalkovo, situated in the Maritsa River valley, in Upper Thrace, with cultural attribution to the Karanovo I horizon and a strong detectable Anatolian influence (Leshtakov et al. 2007:208). The impressive abundance of the flint industry from this site (and the richness of formal toolkits) provides an

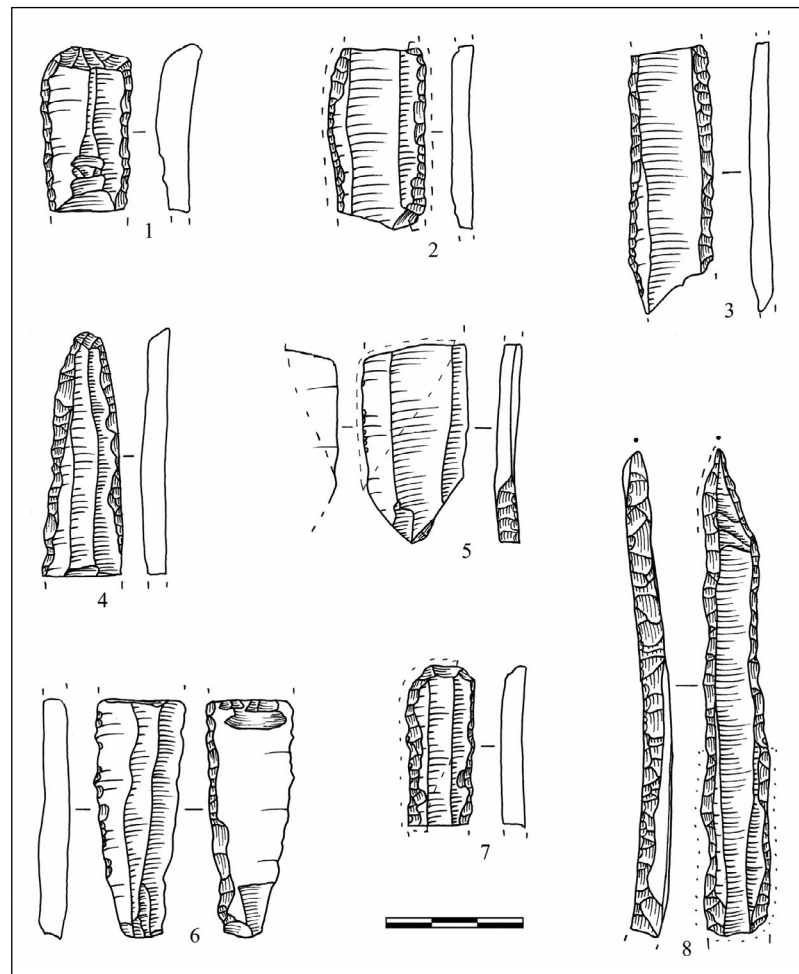


Fig. 7. Typological characteristics of the toolkit from Rakitovo (drawing M. Gurova).

opportunity to focus on their technological parameters and eventually trace their origin in some Anatolian technocomplex (Figs. 3–5). There is already a published preliminary report on a series of flint artefacts, which will be discussed below.

The Early Neolithic site of Rakitovo (in the foothills of the Rhodopes) is one of the most interesting settlements, combining elements of the Karanovo I culture on the one hand, and the complex of west Bulgarian painted pottery with strong similarities to the Starčevo culture, on the other (Raduncheva et al. 2002). The flint assemblage is very small (50 artefacts) and comprises mainly a formal toolkit – 18 tools made of honey-yellow flint (Figs. 6, 7). The rest of the collection consists of 16 blades, 14 flakes and fragments, and 2 cores. The debitage items are made predominantly of a local raw material which is widespread throughout the Rhodope Mountains.

² This reasoning is argued in my last three reports of Kovačevo, for example: Fouilles néolithique franco-bulgare de Kovačevo-rapport 21, Paris 2007.

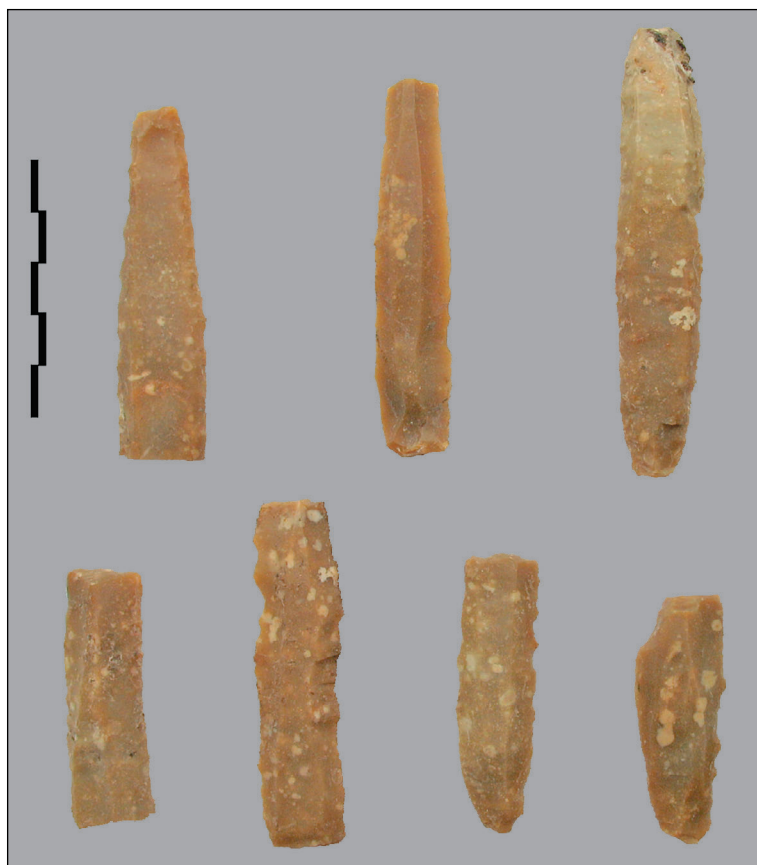


Fig. 8. Formal toolkit from Slatina (photo M. Gurova).

Slatina, an Early Neolithic site in Sofia city, is equally rich in formal tools, but the most spectacular evidence is the identification of the workshop area, with about 2800 artefacts in the large dwelling. The flint implements were studied and very briefly presented as an appendix in the publication by N. Skakun and I. Gatsov (*Nikolov 1992*) (Fig. 8). Of particular interest here is the 'coexistence' of the formal tools located in the living space of the dwelling with the bulk of debitage items concentrated in the knapping area. Unfortunately, the biggest part of the workshop implements were damaged in the fire that destroyed the building, and the 'burned' aspect of their surfaces makes their study very difficult and limited.

The flint assemblages from Tells Karanovo and Azmak have been studied and published by I. Gatsov and M. Gurova, and later came to be considered as a diagnostic feature of the tell settlements. The percentage of formal tools is extremely high in the layer of the Karanovo I and II periods in the eponymous tell (Fig. 9), as well as in layers I–V of Tell Azmak belonging to the Karanovo II culture (Fig. 10). There is a clear predominance of blades with high, steep retouch among the assemblages from both tells.

The differences between the Early Neolithic assemblages from the southern cultural area and those located north of the Stara Planina are well known and require no further emphasis (*Todorova and Vaisov 1993*). As already mentioned, formal toolkits are not documented among the assemblages from Early Neolithic sites in central and north-west Bulgaria. It should be remembered that the Early Neolithic has yet to be discovered in the north-eastern part of the country, possibly linked to adverse environmental conditions at the end of the VII millennium BC (*ibid.* 128).

Nevertheless, it is interesting to note that two sites, Ohoden and Dzuljunitsa, both belonging to the 'monochrome' Neolithic – best represented in the area by the Koprivets culture – show rather divergent cultural affiliations. The former is equated with the final phase of the Proto-Starčevo culture, with apparent parallels at sites such as Divostin, Donja Branjevina, Padina, Lepenski Vir IIIa, Gura Baciului and, respectively, in Bulgaria at Koprivets, Polianitsa-platoto, and Dzhujunitsa (*Ganetsovski 2008*). The latter, through its links to the same Koprivets culture, shows affinities with the Fikirtepe culture in the Marmara region, as well as with the pottery assemblage from the Anatolian colony on the Aegean coast at Hoca Çeşme (*Elenski 2004; 2006*).

T. Tsonev has carried out a study of flint assemblages from central-north Bulgaria, which represents a relevant and basic technological approach toward the particular local facies of expedient industries, focusing dominantly on blade production and showing similarities with Early Neolithic sites in Serbia and Romania. Some similarities (but not convincingly presented) with the lithic inventory from Lepenski Vir are mentioned (*Tsonev 2000; 2007*). My pilot study on a part of the Koprivets flint assemblage and a preliminary series from Dzuljunitsa shows the use of a honey-yellow type of raw material (identical with that of the Karanovo I culture formal toolkit), but also quite different structure, typological repertoire and functional features of the assemblages in comparison with south Bulgarian ones. There are no sickle inserts among the collections,

which is a significant observation with regard to the subsistence activities of local Early Neolithic communities.

Raw material for the toolkits: where from?

How should we summarize our knowledge of the raw material parameters of Early Neolithic assemblages and, in particular, their formal toolkits? It has already been mentioned that foreign specialists have drawn attention to the high quality and yellow-honey-waxy colour of a particular raw material originating from north-east Bulgaria (pre-Balkan platform), and its spread across the region. One study fixed the provenance in the vicinity of Shumen (Voytek 1987).

On the local level the research has gone more slowly. There have been some sporadic studies of cryptocrystalline siliceous rocks ('flint') over the past three decades. The first to show the abundance and variety of the flint sources from north-east Bulgaria, and who tried to establish a database and link the identified flint outcrops with prehistoric artefacts and their circulation, was K. Kanchev (Kanchev 1978; Kanchev et al. 1981).

In his publication, I. Gatsov presumed north-west Bulgaria was the region of provenance of the raw material used for Early Neolithic assemblages from western Bulgaria (see below). At the same time, N.

Skakun noticed that "certain specimens are probably made of Dobrudzha flint". On the basis of her deep knowledge of north-east Bulgarian flint assemblages both from the Neolithic and Chalcolithic, she conceived this fact rather as accidental, emphasizing that the exploitation of Dobrudzha flint started no earlier than the Chalcolithic (Skakun 1993.54). She had already reached the same conclusion regarding a dozen implements from the 'big house' of Slatina (Skakun 1992.102).

There are two general types of flint recognised among the assemblages from Tells Karanovo and Azmak. The investigation was done by geologist Kurčatov, who suggested that the abundance of artefacts was due to the proximity of local outcrops and he (more theoretically than actually) identified them in the region of the Saint Ilia hills in eastern Thrace and not very far from the tells (Gatsov, Kurčatov 1997.215). This assumption has been quoted repeatedly, but never substantiated by further serious research. In fact, it could be considered as having been disproved.

Preliminary research on a series from Yabalkovo has led R. Zlateva to reveal that "...the predominant raw material with identified origin comes from deposits in Upper Thrace, Sredna gora, north (understand western) Bulgaria and eastern Rhodopes" (Leshtakov et al. 2007.201).

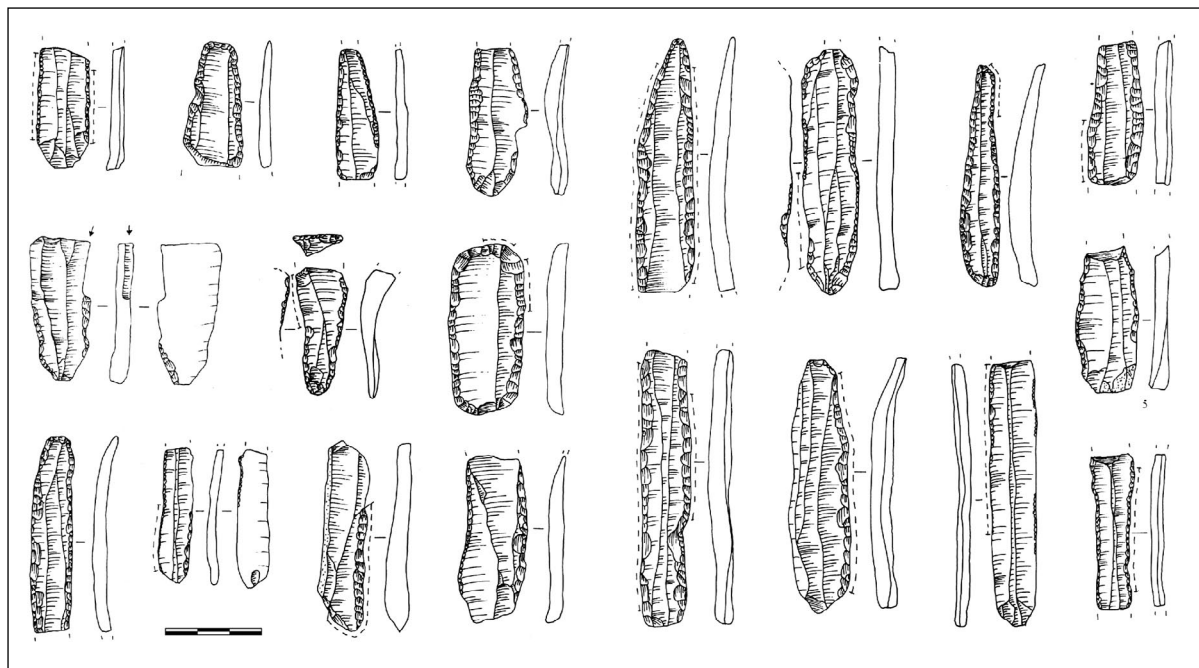


Fig. 9. Typological characteristics of the toolkit from Tell Karanovo – Karanovo I and II periods (after M. Gurova 1997.Taf. 92 and 94).

In fact, the first to presume, somewhat theoretically, a north-eastern provenance for the raw material used for Neolithic big blades was T. Tsonev. He did this in the context of his theory about the role of long blades in the “communal perception of long distance exchange through common metaphors” (Tsonev 2004.262).

The research initiated by the present author, in collaboration with the mineralogist Ch. Nachev, has yielded quite different results. In Bulgaria, according to the geological data, four distinguishable flint types are recorded: Hemus, Dobrudzha, Moesia, and Rhodope flint. Each type has a different geographical distribution, geological age and diagnostic features (Fig. 11). Mineralogical comparison of these different types of flints from Bulgaria unequivocally distinguishes Dobrudzha flint as the most desired material for knapping, and the unique homogeneity and dimensions of the nodules permitted core preparation and debitage of big laminar blanks (Nachev, forthcoming). Nachev’s investigation is based on geological samples and archaeological artefacts from the sites of Kovachevo, Rakitovo, Yabalkovo, and Dzhuljunitsa. His macroscopic observation suggests that the flint that is most similar to the archaeological samples derives from the Dobrudzha flint strata in lower Cretaceous limestone deposits. This flint has perfect conchoidal fracture, which makes it of optimal quality for knapping. The outcrops where this material originates come from the districts of Rasgrad, Ispirih, and Shumen. Macroscopic examination and comparative analysis of archaeological samples (Fig. 12. A) and the contemporaneous flakes taken from the Chakmaka outcrops near Ispirih (Fig. 12.B),

and Kriva reka secondary deposits, located north from Shumen (Fig. 12.C) show that they are visually identical in character. Therefore it is most likely that the formal flint toolkits from the Early Neolithic Karanovo I and II cultural sequence in Bulgaria, originated from the outcrops in the vicinity of three towns – Razgrad, Ispirih and Shumen (Fig. 1). Further thin section analyses by Nachev should reduce the potential candidates for original outcrops of the toolkits under discussion. To resolve the problem of the reliable characterization of ‘Balkan flint’ sources

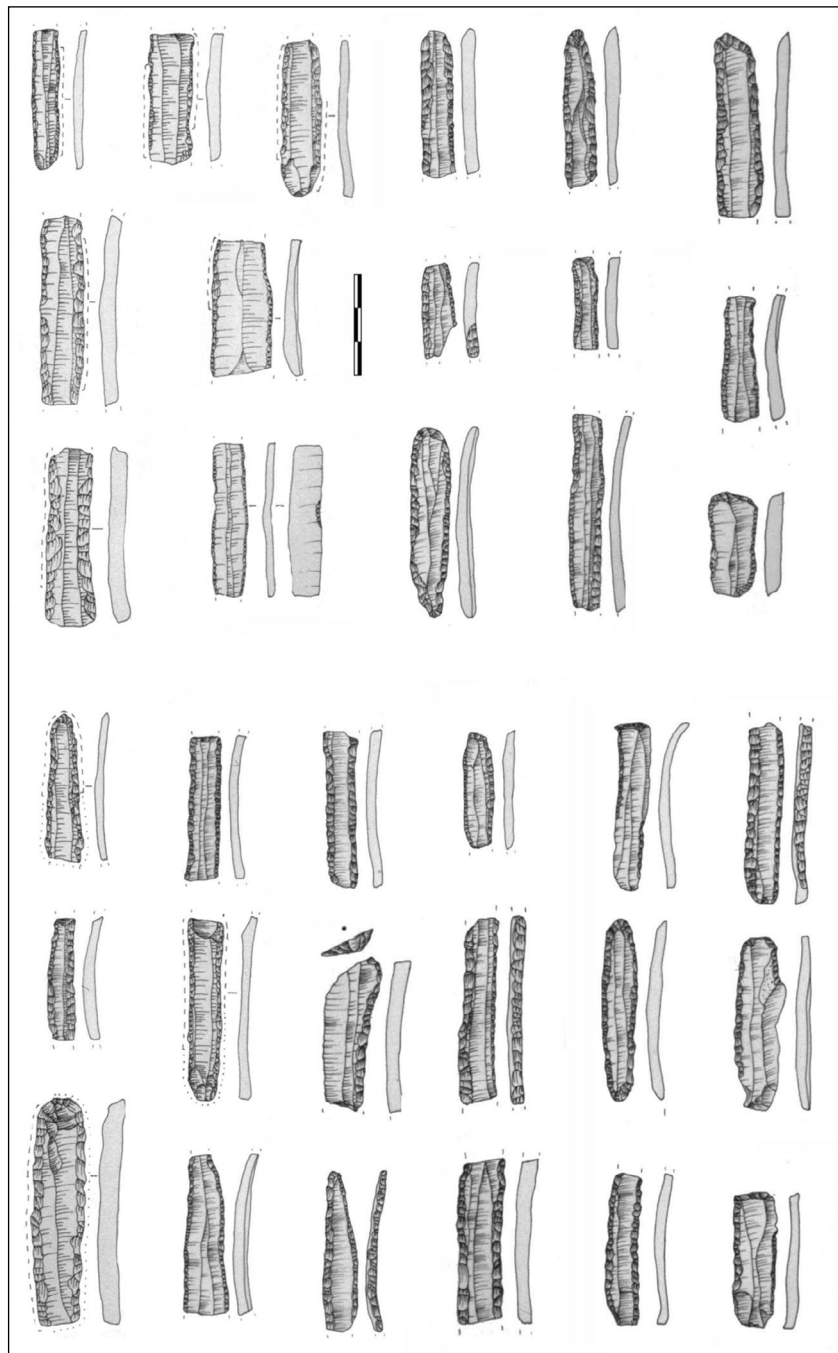


Fig. 10. Typological characteristics of the toolkit from Tell Azmak (drawing M. Gurova).

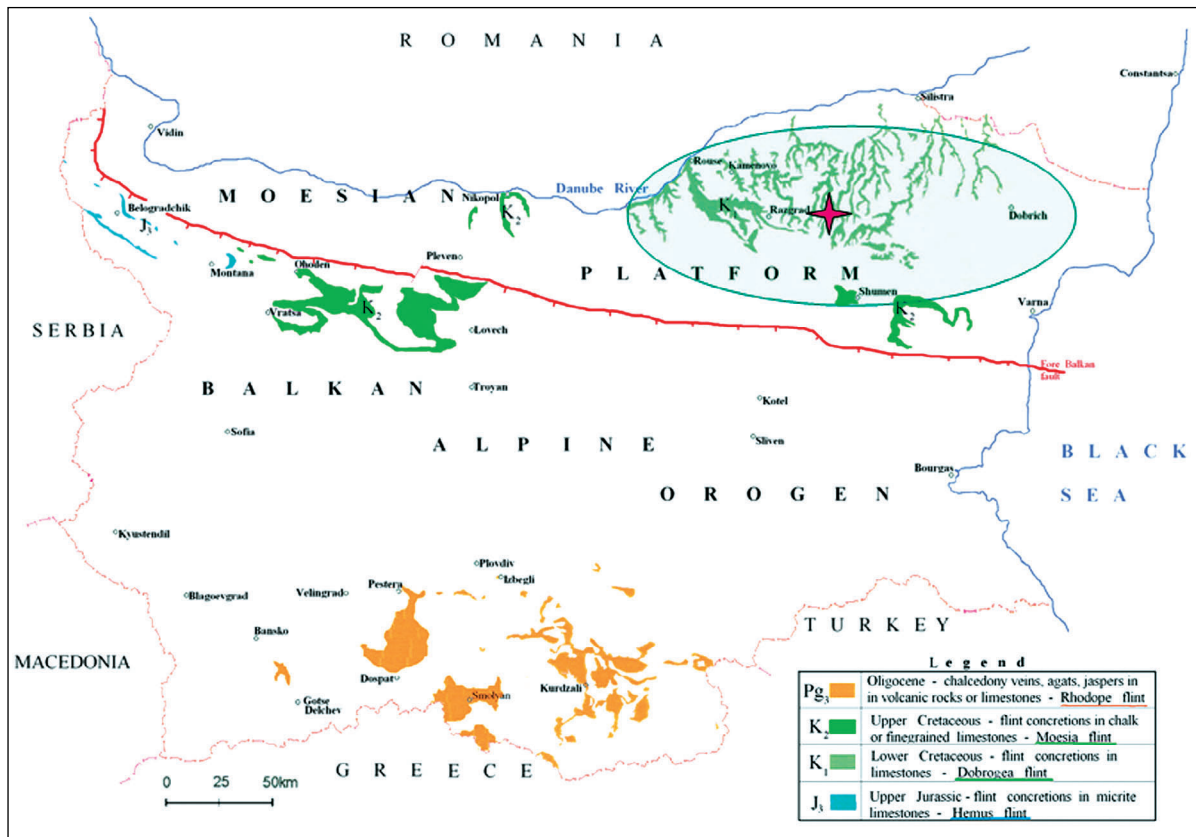


Fig. 11. Geological map showing the distribution of the four major geological units containing 'flint' deposits in Bulgaria (according to Nachev, forthcoming, Figure 1, adapted version).

inductively coupled plasma mass spectrometry (ICP-MS) is initiated by analyzing flint samples from various sources in northern Bulgaria.³ Although archaeological evidence for Neolithic workshops in the region is absent, we have to presume that they existed in the Early Neolithic for ensuring suitable nodules, cores (about 18–20cm long) and debitage (blades): all these products were predestined for the long-distance exchange of good and perhaps embodied know-how.

Tracing the origin of the technological features

As mention above, recent examination of the technical traits of blades (especially with conserved butts and proximal parts) from sites such as Kovačevo, Yabalkovo, Slatina and Rakitovo reveals the use of indirect percussion by punch technique. Retouching was done by simple soft percussion or pressure in the case of high steep retouch. These observations were confirmed by J. Pelegrin, in direct conversation and after observation of a selected series of retouched blades from Yabalkovo.

Chronologically, indirect percussion has been convincingly identified in the Western European Mesolithic, c. 7800 BP (6650 calBC). This technique assures the production of big blades, and in special cases, super-blades, as exemplified by the Neolithic phenomena of Grand Pressigny (France) and Spiennes (Belgium) (Pelegrin 2006.40). Pelegrin's research on blades (most of them fragmented) from Neolithic strata at Franchthi (6624–6378 calBC) led him to deduce that lever pressure (the most sophisticated debitage technique) was used to produce most if not all of them (Pelegrin 2006.48). This sensational discovery suggests that there is *a priori* no theoretical reason to deny the appearance and local development of some advanced technological approach.

Concerning the Balkan Neolithic lamellar tradition, one attempt at tracing its origin was made by J. Kozłowski at 1982. His conclusion was that even in Greece with its Mesolithic and preceramic Neolithic, there was a hiatus before the classical Neolithic (Kozłowski 1982.142). Even more drastic is the situation in Bulgaria where no pre-Neolithic substratum

³ The work will be undertaken in collaboration with C. Bonsall and Rob Ellam at the Isotope GeoScience Facility of the Scottish Universities Environmental Research Centre, East Kilbride, UK.

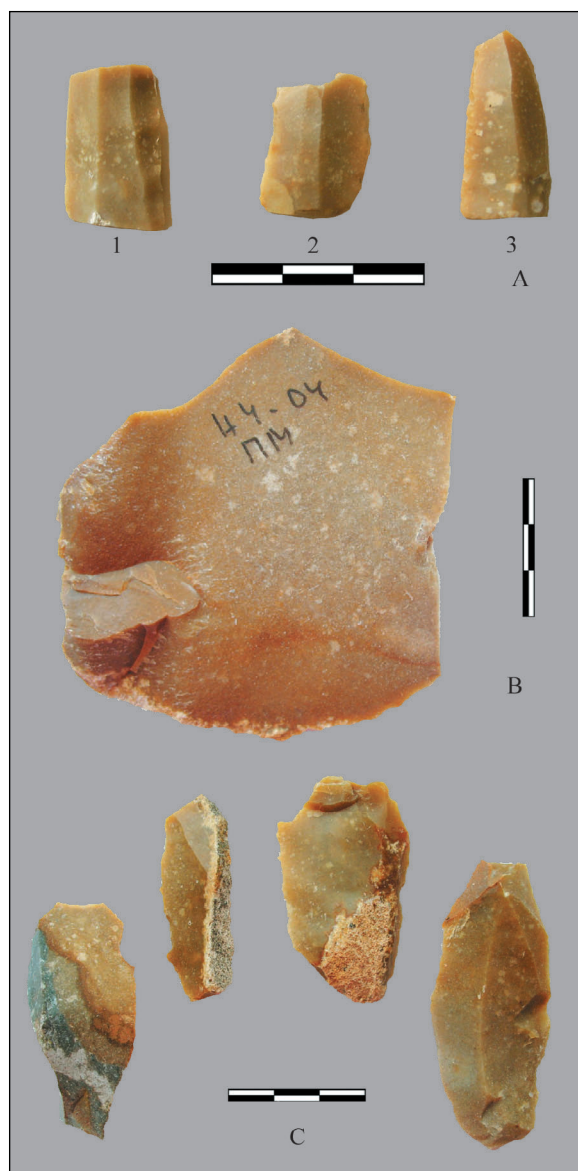


Fig. 12. Macroscopic photographs of raw materials: top to bottom, A – archaeological items from: 1 – Dzhuljunitsa, 2 – Rakitovo, 3 – Yabalkovo; B – flint flake from Chakmaka outcrops (near Isperih); C – flakes from Kriva reka outcrops – near Shumen. Photo: M. Gurova.

has been identified and the affinity of the Karanovo I flint industry with the cultural group of Anzabegovo-Vršnik totally excluded the possibility of a local origin of this industry among an epipalaeolithic population (*ibid.* 149). This rather discouraging concept is repeated consistently by I. Gatsov in his research (Gatsov 2001; 2005; 2006). He concluded that “the bearers of painted ceramic who brought this technology and its roots were outside of Europe. In Bulgaria, it then appears as already established know-how” (Gatsov 2006.153). Even more explicit is H. Todorova who assumed that the analysis of the flint industries with macroblades from

the Early Neolithic cultures of Karanovo I, Starčevo and Magulitza reflects their Anatolian roots (Todorova and Vaisov 1993.55).

The problem of tracing our chipped-stone industry to the comfortable milieu of Anatolia is somehow cognitive, and as noticed by M. Özdoğan... “any attempt at comparing Anatolian assemblage with that of the Balkans has to consider the nature of the assemblage as a whole, without overstating the presence or the absence of selected objects” (Özdoğan 2006.23). In the present state of research, such a relevant comparison is not feasible, and our efforts should be focused instead on detailed technological studies of the available assemblages from Kovačevo, Dzhuljunitsa and Yabalkovo, in order to elucidate the fundamental and variable technological skills and decision-making of the Neolithic flint knappers. Many objective obstacles are unavoidable, including our lack of knowledge about quarries for obtaining raw material, about workshops for initial core preparation and subsequent debitage, about exchange networks and strategy, etc. Hopefully, some of these limitations could be surmounted through new planned surveys and research. Only then would we be able to resolve the problem of Early Neolithic macroblade technology in the Balkans.

Functional aspects of the formal tools

By definition, the formal tools are made with some anticipated functions, and this kind of utilitarian determination represents one of the most peculiar traits of formal toolkits, whatever their contextual affiliation. An attempt at use-wear analysis of Early Neolithic assemblages from Bulgaria was made in the early 1990s by N. Skakun (Skakun 1992; 1993). Her study of the functional parameters of west Bulgarian Neolithic assemblages is informative in a general sense and demonstrated a large repertoire of implement functions, but no possibility of correlation between functional types and their precise stratigraphic positions. The multifunctional aspect of the artefacts was underlined in the context of common cereal, hide, bone and wood processing. The presence of threshing sledge inserts was noted, but without any contextual data (Skakun 1993.53).

The present author’s use-wear observations on numerous collections also show quite variable utilization detected on unretouched blades, but mainly on retouched tools (Gurova 1997; 2001a; 2002; 2004; 2006; Gurova and Gatsov 2000). Blades with marginal retouch are the most polyfunctional among the

artefact categories. Detecting the functions of enough narrow blades with high steep retouch proved particularly challenging – in fact, they were mainly used for scraping wood and hide. Perforators/borers on bilaterally-retouched blades were mostly used for drilling different materials.

Among the most impressive and even visually recognisable tools are sickle inserts. These pieces possess typical cereal polish induced by harvesting (Fig. 13). Typologically, they comprise unretouched blades, as well as retouched and truncated blades and end-scrapers. It is worth noting that these sickle inserts were often re-sharpened in order to permit reuse for the same or another function. This approach, if done repeatedly, resulted in progressive modification of edges, until they became relatively steep and inefficient. In some cases, after use in their primary function, some sickle inserts were reused for hide scraping.

Discussion

The formal toolkits in their contextual embodiment are intimately linked with the debate and paradigms of Balkan Neolithisation. Conceivably, they could be treated as cultural markers, in the same way as the white-on-red painted pottery of the Karanovo I culture. Of course, one could say the discriminatory role of flints as chrono-cultural markers is much more limited, but the important point here is that white-on-red pottery, whether linked (or not!) to the formal toolkit, cannot be considered as an indicator of the beginning of the Neolithic (this refers particularly to Bulgaria). As Özdoğan has argued, it is “...because painted pottery in Western Anatolia that bears significant similarities to those of the Balkans begins rather late in the Neolithic sequences” (Özdoğan 2006.22).

On the other hand, white-painted pottery appears from the very beginning of the Kovačevo sequence, but as the excavators of the site have underlined, “it appears that early levels of Kovačevo have produced pottery which is earlier than the Karanovo I culture as it is defined in Bulgarian Thrace. In the earliest period Kovačevo was really part of a regional facies that extends from Greek western Macedonia in the south (Nea Nikomedeia, Giannitsa) to the Ovče Pole in the north Anzabegovo, Vršnik.” (Lichardus-Itten *et al.* 2002.130). This conclusion does not contradict the theory of an initial Neolithic diffusion along the Struma valley, but simply advocates that the first Neolithic settlers in the region

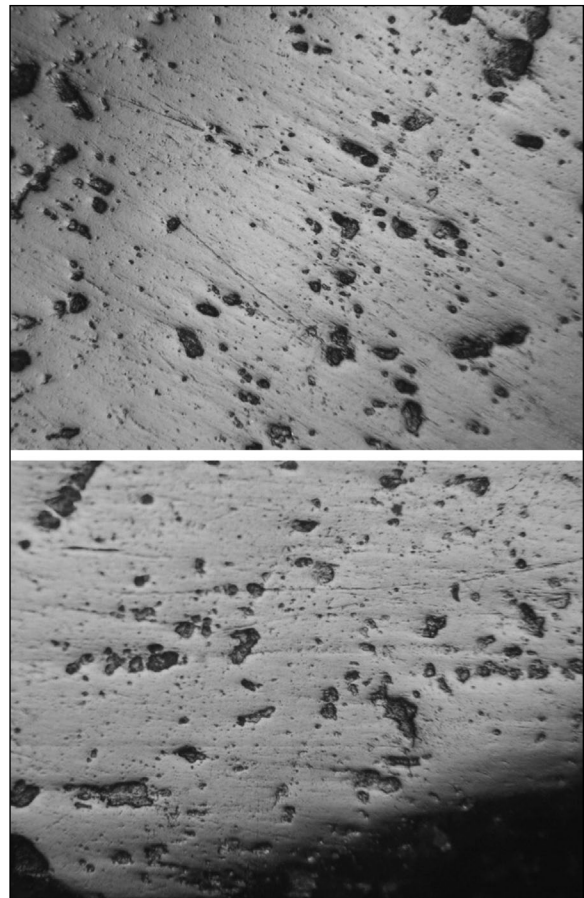


Fig. 13. Microphotographs of cereal polish on a tool from Kovačevo (cf. Fig. 2, first row, second from right). Microphoto – M. Gurova, using a Leitz Orthoplan microscope with a Nikon optical camera. Magnification x 100.

were not those from Thrace, *i.e.* the bearers of the Karanovo I culture. This assumption is supported by the above-mentioned fact that the formal toolkit appears approximately in level Ic-Id of the Kovačevo sequence. In this regard, if Struma (as seems likely) was one of the first and direct routes of Neolithic diffusion into Balkans, then the part of the ‘Neolithic package’ consisting of typical Karanovo I pottery and formal flint toolkits could not be linked with this first stage of demic and cultural diffusion. The recently envisaged north-east provenance of the raw material for these toolkits is an additional reason for discarding the idea of a Struma (and consequently via Mesta) spread of the Karanovo I culture in Thrace.

How does the situation look if we turn to another scenario for the first wave of Neolithisation in Bulgaria, via the old Struma, Vardar and Morava rivers to the north, and then a ‘west to east’ movement along the Danube to north-central and north-eastern Bulgaria (Todorova and Vaisov 1993.61). As explained above, there is no Early Neolithic site containing

formal toolkits, and the problem of the ‘monochrome’ pottery cultural alliance is complicated enough. The fact that the formal toolkits were likely made of Dobrudzha flint, and in that area there are no recorded Early Neolithic settlements, could become a critical point for the assumption that after reaching the stage of white-painted pottery, the ‘monochrome’ Neolithic area settlers penetrated into Thrace c. 6200 calBC and established the beginning of the Karanovo I culture (Todorova and Vaisov 1993:62).

Recently, a new scenario for the origin and spread of the monochrome Neolithic was advanced, utilising evidence from pottery analysis of the Koprivets culture. The idea of M. Özdoğan (1997; 1999) suggesting an interaction zone between north-central Bulgaria, north-west Anatolia and Turkish Thrace, is gaining adherents and serves to promote the theory of the penetration of Neolithic elements from north-west Anatolia to the north via the Maritsa River valley, ...“then along the valleys of the Tundzha and the Sazlijka Rivers, and through the passes of the Stara Planina into northern Bulgaria (the basin of the Iantra River)” (Boydzhiev 2006:9). On the basis of analysis and correlation of the available clusters of ¹⁴C dates related to the transitional period from the Mesolithic to the Neolithic in local variations (pre-pottery, aceramic, monochrome), the same author concluded that the penetration route of the Monochrome Neolithic from the northwest Balkans along the Danube proposed by Todorova and Vaisov (1993) should be rejected (*ibid.* 9).

Whatever theories of routes and ‘waves of succession’ of the Neolithic spread into Balkans have been formulated, no one has been able to explain the appearance of the formal flint toolkits – were they brought with the migrants along their unclear route from some part of Anatolia (central or north western), or were they created in the milieu of local pre-Karanovo enclaves? There were two potential candidates for this ‘nuclear area’ of creation of the toolkit’s technological and stylistic features: the region of the Struma and Vardar valleys, which “*must have been directly and independently colonized*”, but which settlers have been keeping as “*their own, probably direct connection with Asia Minor.*” (Lichardus-Itten et al. 2006:88). If so, then we have to suppose that from the very beginning of their adaptation to the local conditions, they initiated very long distance trips to the completely unknown north east of Bulgaria to discover and start to supply flints, and establish the big blade industry, and subsequently go back with the material and the new know-how

for working with it. Then from this nuclear area, the population with distinctive, white-on-red pottery and the available formal flint toolkit could start to move into the east and the Thracian plain. The idea of west-east movement in the settling of Thrace is not new, and has been convincingly argued by Thissen on the basis of the chronological framework established for the south Balkan Neolithisation process (Thissen 2000). This scenario may work vis-à-vis the pottery evidence, but it is not viable in relation to the lithic phenomenon discussed.

Not yet proved, but at least more reasonable, is the possibility that the ‘monochrome’ population from central Bulgaria, already sufficiently experienced in simple lamellar production, as shown by Tsonev’s research, moved to the east in search of something better than their local flint raw material and reached the Dobrudzha region with its abundant flint outcrops. On the basis of their local and independent elaborating of their technological skills, they could have become the ‘new flint knappers’ – in Chapman’s sense of people with a newly-acquired ability and decision-making capacity. Unavoidably, they could reach the Thracian plain for establishing the Karanovo I culture (as suggested by Todorova) or simply to join an enigmatic pre-Karanovo I substratum in this area (?). As a consequence, these people could have predestined their production, especially for the distribution network of goods, values, and social messages. In this sense it is worth quoting the original post-processual interpretation of Early Neolithic ‘macroblades’ and their circulation offered by T. Tsonev: “...*the social model of tell settlements also influenced the composition and 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).

Of course, a range of contradictory rhetorical questions could be formulated if one wanted to object to this assumption. One of the most crucial is why the new flint knappers did not leave evidence of these toolkits in and around settlement sites in northern Bulgaria? An unsatisfactory answer for the lack of evidence in north-east Bulgaria (Dobrudzha) could be that there is no theoretical need to expect the establishment of longstanding settlements and buildings in the area – only temporary camps in the vicinity of raw material outcrops serving the flint workshop activities are required, and the remains of these camps may never be discovered. However, the remnants of workshops with their particular *instrumen-*

tarium (however restricted) must be found and, in the author's opinion, this should be made a priority for future prehistoric research in Bulgaria.

To answer all questions in the sphere of the problems and research on formal toolkits would require an immense amount of work. In my opinion, the relevant issue for this rather complex and complicated situation is to complete and collate all the data for these toolkits from the Balkans. This is necessary in order to advance further with questions of raw material supply strategy (were there other outcrops apart from those in Dobrudzha), and the manufacturing, functioning and spread of these particular flint assemblages across a wide and varied eastern Euro-

pean landscape. To resolve these problems will undoubtedly assist in answering some of the more controversial questions raised within the archaeology of prehistoric identity and the mind of the Early Neolithic Balkans.

— ACKNOWLEDGEMENTS —

I would like to thank Mihael Budja for inviting me to the 14th Neolithic Seminar in 2007. My thanks also to Clive Bonsall for his critical reading of the first draft of this paper, and for suggesting improvements to the English.

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REFERENCES

- ANDREFSKI W. 1994. Raw material availability and the organization of technology. *American Antiquity* 59/1: 21–34.
- BAILEY D. 2000. *Balkan Prehistory*. Exclusion, incorporation and identity. Routledge. London and New York.
2005. *Prehistoric figurines. Representation and Corporeality in the Neolithic*. Routledge. London and New York.
- BONSALL C. 2003. The Iron Gates Mesolithic. In P. Bogucki, P. Crabtree (eds.), *Ancient Europe 8000 B.C. to A.D. 1000: Encyclopedia of the Barbarian World*. Scribner. New York: 175–178.
2008. The Mesolithic of the Iron Gates. In G. Bailey, P. Spikins (eds.), *Mesolithic Europe*. Cambridge University Press. Cambridge: 238–279.
- BONSALL C., COOK G., LENNON R., HARKNESS D., SCOTT M., BARTOSIEWICZ L. and McSWEENEY K. 2000. Stable Isotopes, radiocarbon and the Mesolithic-Neolithic Transition in the Iron Gates. In M. Budja (ed.), *7th Neolithic Studies, Documenta Praehistorica* 27: 119–132.
- BORIĆ D. 1999. Places that created time in the Danube Gorges and beyond, c. 9000–5500 BC. In M. Budja (ed.), *6th Neolithic Studies, Documenta Praehistorica* 26: 41–70.
2005. Deconstructing essentialisms: unsettling frontiers of the Mesolithic-Neolithic Balkans. In D. Bailey, A. Whittle and V. Cummings (eds.), *(Un)settling the Neolithic*. Oxbow Books. Oxford: 16–31.
- BOYADZIEV Y. 1995. Chronology of Prehistoric Cultures in Bulgaria. In D. Bailey, I. Panayotov (eds.), *Prehistoric Bulgaria*. Madison Wisconsin. Monographs in World Archaeology 22:149–191.
2006. The role of absolute chronology in clarifying the Neolithization of the eastern half of Balkan Peninsula. In I. Gatsov and H. Schwarzberg (eds.), *Aegean – Marmara – Black Sea: the Present State of research on the Early Neolithic*. Beier & Beran. Langenweissbach: 7–14.
- CHAPMAN J. 2000. *Fragmentation in Archaeology. People, places and broken objects in the prehistory of south-eastern Europe*. Routledge. London and New York.
- CHAPMAN J. and GAYDARSKA B. 2007. *Parts and Wholes. Fragmentation in prehistoric context*. Oxbow Books. Oxford.
- ELENSKI N. 2004. Cultural Contacts of North-Central Bulgaria with Thrace and the Marmara Area in the Early Neolithic. In V. Nikolov, K. Bacvarov, P. Kalchev (eds.), *Prehistoric Thrace*. Sofia-Stara Zagora: 71–79.
2006. Trench Excavation at Dzhulyunitsa-Smardesh Early Neolithic Site, Veliko Tarnovo Region (Preliminary Report). *Arheologia* 1–4: 96–117.
- ELSTER E. 1977. *Neolithic technology: a Case Study in Lithic Analysis for Old Europe, 6500–4000 BC*. Ph.D dissertation. University of California. Los Angeles.
- GANETSOVSKI G. 2008. An Early Neolithic grave from Ohoden, Vraca district. In M. Gurova (ed.), *Prehistoric*

Research in Bulgaria: New Challenges. Faber. Veliko Tarnovo (forthcoming).

GATSOV I. 1993. *Neolithic Chipped Stone Industries in Western Bulgaria*. Jagellonian University Press. Kraków.

2000. Chipped Stone Assemblages from South Bulgaria and North-West Turkey (Epipalaeolithic/Mezolithic and Neolithic). In L. Nikolova (ed.), *Technology, Style and Society. Contributions to the Innovations between the Alps and the Black Sea in Prehistory*. Oxford: BAR International Series 854: 1–30.

2005. Some observation about bullet core technique during 7th/6th millennium BC. In C. Lichter (ed.), *How did farming reach Europe? Anatolian-European relations from the second half of the 7th through the first half of the 6th millennium calBC*. BYZAS 2. Istanbul: 213–220.

2006. The state of research into the problem of the Pleistocene-Holocene transition in the present area of Bulgaria. In I. Gatsov and H. Schwarzberg (eds.), *Aegean – Marmara – Black Sea: the Present State of Research on the Early Neolithic*. Beier & Beran. Langenweissbach: 151–156.

GATSOV I., KURČATOV V. 1997. Neolithische Feuersteinartefakte. Mineralogische Untersuchung und technisch-typologische Charakteristik. In S. Hiller and V. Nikolov (eds.), *Karanovo, I, Die Ausgrabungen im Südsektor 1984–1992*. Verlag Ferdinand Berger & Söhne, Horn/Wien. Salzburg – Sofia: 213–227.

GATSOV I., GUROVA. M. 1998. Izsladvane na kremachni artefakti ot rannoneolithiya plast na Azmashkata selishtna mogila kraji Stara Zagora. *Izvestiya na muzeite ot Yugoiztochna Balgaria XIX*: 7–20.

GÖRSDORF J. 1977. C¹⁴ – Altersbestimmungen. In S. Hiller and V. Nikolov (eds.), *Karanovo, I, Die Ausgrabungen im Südsektor 1984–1992*. Verlag Ferdinand Berger & Söhne, Horn/Wien. Salzburg – Sofia: 377–384.

GÖRSDORF J. and BOJADŽIEV J. 1996. Zur absoluten Chronologie der bulgarischen Urgeschichte. *Eurasia Antiqua 2*: 105–173.

GUROVA M. 1997. Gebrauchsspurenanalyse des neolithischen Feuersteininventars. In S. Hiller and V. Nikolov (eds.), *Karanovo, I, Die Ausgrabungen im Südsektor 1984–1992*. Verlag Ferdinand Berger & Söhne, Horn/Wien. Salzburg – Sofia: 363–375.

2001a. Funktsionalen analiz na kremachen ansambal ot selishtna mogila Kapitan Dimitriev. *Arheologia 2–3*: 38–47.

2001b. Analyse fonctionnelle des assemblages en silex d'Ilipinar, phases X et IX. In J. Roodenberg, L. Thissen (eds.), *The Ilipinar Excavation II, Pihans 93*. Leiden, 2001: 297–325.

2002. Feuersteininventar aus Sondage O 19 in Tell Karanovo: typologische und funktionale Analyse. In S. Hiller and V. Nikolov (eds.), *Karanovo, II. Die Ausgrabungen in O19*. Phoibos Verlag. Wien: 149–175.

2004. Evolution and Retardation: Flint Assemblages from Tell Karanovo. In V. Nikolov, K. Bačvarov, P. Kalchev (eds.), *Prehistoric Thrace*. Sofia-Stara Zagora: 239–253.

2005. Flint artefacts in the context of the diagnostic finds. *Annuary of New Bulgarian University, Department of Archaeology VI*: 88–103.

2006. Functional Aspects of the Early Neolithic Flint Assemblages from Bulgaria and NW Anatolia. In I. Gatsov and H. Schwarzberg (eds.), *Aegean – Marmara – Black Sea: the Present State of Research on the Early Neolithic*. Beier and Beran. Langenweissbach, 2006, 157–175.

GUROVA M., GATSOV I. 2000. Research Problems of the Early Neolithic Flint Assemblages from Thrace (Bulgaria). In S. Hiller and V. Nikolov (eds.), *In Karanovo, III. Beiträge zum Neolithikum in Südosteuropa*. Phoibos Verlag. Wien: 155–163.

KANCHEV K. 1978. Prouchvaneto na flintovia material ot arheologicheski razkopki, problemi I zadachi. *Interdistiplinarni Izsledvaniya II*: 81–89.

KANCHEV K., NACHEV I., KOVNURKO G. 1981. Kremachnite skali v Balgaria i tiahnata eksloatatsiya. *Interdistiplinarni Izsledvaniya VII–VIII*: 41–59.

KOZŁOWSKI J. 1982. La Néolithisation de la zone Balkano-Danubienne du point de vue des industries lithiques. In J. Kozłowski (ed.), *Origin of the Chipped Stone Industries of the Early Farming Cultures in Balkans*. Państwowe Wydawnictwo Naukowe. Warszawa – Kraków: 132–170.

LESHTAKOV K. 2006. Arheologicheski razkopki na praeistoricheskoto selishte do s. Yabalkovo, Dimitrovfradsko. Ranen neolit. In V. Nikolov, G. Nehrizov and Y. Tsvetkova (eds.), *Arheologicheski razkopki po traseto na zhelezopatnata liniya Plovdiv-Svilengrad prez 2004 g.* Faber. Veliko Tarnovo: 166–204.

LESHTAKOV K., TODOROVA N., PETROVA V., ZLATEVA-UZUNOVA R., ÖZBEK O., POPOVA TS., SPASSOV N. and ILIEV N. 2007. Preliminary report on the salvage archaeo-

- logical excavations at the Early Neolithic site at Yabal-kovo in the Maritsa Valley, 2000–2005 field seasons. *Anatolica XXXIII: 185–234*.
- LICHARDUS-ITTEN M., DEMOULE J.-P., PERNICHEVA L., GREBSKA-KULOVA M., KULOV I. 2002. The Site of Kovačevo and the Beginnings of the Neolithic Period in South-western Bulgaria. The French-Bulgarian excavations 1986–2000. In M. Lichardus-Itten, J. Lichardus, V. Nikolov (eds.), *Beiträge zu jungsteinzeitlichen Forschungen in Bulgarien*. Dr. Rudolf Habelt GMBH. Bonn: 99–158.
2006. Kovačevo, an Early Neolithic site in South-West Bulgaria and its importance for European Neolithization. In I. Gatsov and H. Schwarzberg (eds.), *Aegean – Marmara – Black Sea: the Present State of research on the Early Neolithic*. Beier and Beran. Langenweissbach: 83–94.
- NACHEV CH. in press. Osnovnite tipove flint na teritorija ta na Balgaria kato iztochnitsi na surobini za naprava na artefakti. *Interdistsiplinarni Izsledvaniya XX, in press*.
- NIKOLOV V. 1992. *Rannoneolithno zhlishte ot Slatina (Sofia)*. Razkopki i prouchvaniya 25. Izdatelstvo na BAN. Sofia.
1996. Iugozapaden variant na kultura Karanovo I. *Arheologia 2–3: 1–8*.
1998. *Proučvanija varhu neolithnata keramika v Trakija. Keramichni kompleksi Karanovo II–III, III i III–IV v konteksta na Severozapadna Anatolija i Ju-goiztocna Evropa*. Agato. Sofia.
2006. *Kultura i izkustvo na praistoricheska Trakia*. Letera. Plovdiv.
2007. *Neolithi kultovi masichki*. NAIM-BAN. Sofia.
- ÖZDOĞAN M. 1997. The beginning of Neolithic economies in South-eastern Europe: an Anatolian perspective. *Journal of European Archaeology 5(2): 1–33*.
1999. Northwest Turkey: Neolithic Cultures in Between the Balkans and Anatolia. In M. Özdoğan. (ed.), *Neolithic in Turkey. The Cradle of Civilization*. Arkeoloji ve Sanat Yay. Istanbul: 202–224.
2006. Neolithic cultures at the contact zone between Anatolia and the Balkans – Diversity and homogeneity of the Neolithic frontiers. In I. Gatsov and H. Schwarzberg (eds.), *Aegean – Marmara – Black Sea: the Present State of research on the Early Neolithic*. Beier & Beran. Langenweissbach: 21–28.
- ÖZDOĞAN M., GATSOV I. 1998. The Aceramic Neolithic period in Western Turkey and in the Aegean. *Anatolica 24: 209–232*.
- PELEGRIN J. 2006. Long blade technology in the Old World: an experimental approach and archaeological results. In J. Appel and K. Knutsson (eds.), *Skilled production and Social reproduction. Aspects of Traditional Stone-Tool Technology*. SAU- Uppsala University. Uppsala: 37–68.
- PERLÈS C. 1990. L'outillage de Pierre taillée néolithique en Grèce: approvisionnement et exploitation des matières premières. *Bulletin de Correspondance Hellénique 114 (IV): 1–42*.
2001. *The Early Neolithic in Greece. The first farming communities in Europe*. Cambridge World Archaeology. Cambridge University Press. Cambridge.
- RADUNCHEVA A, MATSANOVA V., GATSOV I., KOVACHEV G., GEORGIEV G., CHAKALOVA E. and BOZHILOVA E. 2002. *Neolithno selishte do grad Rakitovo*. Razkopki i prouchvaniya 29. Gal-Iko. Sofia.
- RENFREW C. and BAHN P. 2005. *Archaeology. The Key Concepts*. Routledge. London and New York.
- SKAKUN N. 1992. Tipologo-trasologicheski analiz na oradiyata na truda ot zhlishtnoto pomeshtenie. In V. Nikolov (ed.), *Rannoneolithno zhlishte ot Slatina (Sofia)*. Razkopki i prouchvaniya 25. Izdatelstvo na BAN. Sofia: 102–106.
1993. Results of traseological examination of flint implements from Neolithic settlements in Western Bulgaria. In I. Gatsov (ed.), *Neolithic Chipped Stone Industries in Western Bulgaria*. Jagellonian University Press. Kraków: 52–54.
- SREJOVIĆ D. 1969. *Lepenski Vir, Nova praistorijska kultura u Podunavlju*. Srpska književna zadruga. Beograd.
1972. *Europe's First Monumental Sculpture. New Discoveries at Lepenski Vir*. Thames and Hudson. London.
- THISSEN L. 2000. A Chronological Framework for the Neolithisation of the Southern Balkans. In S. Hiller and V. Nikolov (eds.), *In Karanovo, III. Beiträge zum Neolithikum in Südosteuropa*. Phoibos Verlag. Wien: 193–212.
- TODOROVA H. (ed.) 2002. *Durankulak, Band. II, Teil 1 1, 2, Die prähistorischen Gräberfelder von Durankulak*. Deutsches Archäologisches Institut. Sofia.

TODOROVA H. and VAISOV I. 1993. *Novokamennata epoha v Balgaria (kraiat na sedmo-shesto hiliadoletie predi novata era)*. Nauka i izkustvo, Sofia.

TSONEV T. 2000. Knapping Technology vs. Pattern of Raw Material Supply (On the Example of Early Neolithic Flint Assemblages from the Orlovets and Koprivets sites, Northern Bulgaria). In L. Nikolova (ed.), *Technology, Style and Society. Contributions to the Innovations between the Alps and the Black Sea in Prehistory*. Oxford: BAR International Series 854: 29-35.

2004. Long Blades in the Context of East Balkan and Anatolian Complex Sedentary Society, distribution and

appearance of Early Neolithic tulip-like pottery in eastern Balkans. In V. Nikolov, K. Bacvarov, P. Kalchev (eds.), *Prehistoric Thrace*. Sofia-Stara Zagora: 259-263.

2007. *Flint knapping techniques and paleo-environment on North Central Bulgaria*. NAIM-BAN. Sofia.

VOYTEK B. 1987. Analysis of lithic raw materials from sites in eastern Yugoslavia. In K. Bíró (ed.), *Papers for the first international conference on prehistoric flint mining and lithic raw material identification in the Carpathian Basin*. Budapest-Sümeg. Budapest: 287-295.

