

'Balkan Flint' – fiction and/or trajectory to Neolithization: Evidence from Bulgaria

Maria Gurova

Introduction

As a first point it is important to restate the 'definition' of 'Balkan Flint': it is high quality, yellow-honey-waxy coloured and white-spotted flint with a presumed but never convincingly demonstrated provenance on the 'Pre-Balkan Platform' in north Bulgaria; it is often called 'Balkan (Pre-Platform) flint' or, in francophone literature, 'silex balkanique/blond'. Various and sometimes serious ambiguity and speculations have been provoked by the sporadic macroscopic descriptions used for the determination of this type of flint and the consequent indiscriminate repetitive utilisation of the term. Some aspects of this 'mythologisation' were discussed at the 'Balkan Flint' session organised in the frame of the EAA 15th Meeting in Riva del Garda (Italy) in 2009¹.

This paper (which first version was presented at the session) focuses on the current state of research and knowledge about 'Balkan flint' (hereinafter BF) and trajectories flowing from the BF problem to the bigger and increasingly complex problem of the Neolithization of the eastern Balkans. This retrospective introduction briefly traces the emergence and consolidation of the BF problem within the research agenda of specialists working on Balkan prehistory. With no pretence of exhaustion of the topic, the present author attempts to schematize the process of accumulation of empirical and theoretical reasons that have led scholarly activity toward and finally resulted in the above-mentioned scientific session. Also the state of confusion as regarding the term BF and its rather inconsistent use will become evident.

As early as the 1970s E. Comşa wrote that during the Neolithic period, the main type of flint in use in Dobrudzha, the Wallachian Plain of Oltenia, and the south of Moldavia was the "silex balkanique" of which numerous outcrops have been located in Dobrudza (probably on both the Bulgarian and Romania sides?) and on the Pre-Balkan platform in northern Bulgaria (Comşa 1976, 240). More recently, 'Balkan Flint' artefacts have been reported from Schela Cladovei as Starčevo culture elements, emerging in the area as the result of an initial contact with farmers (Bonsall 2008, 270-71). A collaborative paper presented at the above-

1 The session entitled "Balkan Flint" in SE European Prehistory: Chronological, Cultural and Social Perspectives" was organized were M. Gurova (Bulgaria), Clive Bonsall (UK), B. Voytek (USA) and D. Borić (Serbia/UK).

mentioned session² was focused on the recent Schela Cladovei materials in the view of the 'Balkan Flint' perspective. Some information concerning the 'Balkan Flint' as raw material for Neolithic assemblage from the site of Limba in Romania is commented in a recent paper by O. Crandel (2008). A fortunate meeting between the author and a Romanian colleague R. Dobresku led to a challenging observation and discussion of the raw material of which the assemblage of the Palaeolithic site of Ciuperceni (south Romania) is made: it is visually identical to the BF nodules easily accessible on both banks of the Danube near Nikopol – respectively – Turnu Severin. This fact may be conceived as a new trajectory for investigating of the implications of BF in the life-style, interactions and networks of the human groups inhabiting the Danube banks in prehistory, the actual border between Bulgaria and Romania, at present.

The BF label largely appeared in the specialized literature in the 1980s, and especially in the publications of J. K. Kozłowski, who was at that time involved in different research projects in the Balkan area: at the Palaeolithic cave of Temnata in Bulgaria and several sites in the former Yugoslavia – the Iron Gates region and beyond. His conclusions about the Neolithic flint industries imply the wide scale distribution of high quality flint from the 'Pre-Balkan Platform' in northern Bulgaria (Kozłowski 1982, 150; 1988, 561; Kozłowski, Kozłowski 1984, 260, 267). The same probability of provenance is noted for some artefacts from later Vinča culture sites in Serbia (Kaczanowska, Kozłowski 1990). Many prehistoric sites in Serbia have been investigated by foreign expeditions and the common observation about the flint material is the presence of imported high quality flint from most probably the Pre-Balkan platform in northern Bulgaria (Voytek 1987).

As for the BF evidence from actual Republic of Macedonia, undoubtedly interesting is the chipped-stone industry from Anzabegovo-Vršnik cultural group. The material from Anza was studied by E. Elster, but there is no strictly stratified approach to the assemblages and the consideration of the chronological sequence is rather complicated. However, Elster mentioned that among the implements there was "honey-brown flint appearing to be similar to well known eastern European flint with no known local source" (Elster 1977, 161). Recently Biagi and Starnini reported BF artefacts from Early Neolithic sites from Macedonia (Veles district) (Biagi, Starnini 2010b, 122-124, fig. 1).

Present day investigations on the prehistoric raw materials in Serbia and the development of the BF problem are concerned in the studies of J. Šarić (2003; 2004), V. Bogosavljević-Petrović (1999, see also this issue) and D. Borić (2007)³. However, noteworthy is the fact that the conventional view referred to above has its followers like J. Jović (1997) who envisaged west Bulgaria as a source area for the flint used to produce the prehistoric tools in Serbia, and I. Radovanović who argued that the Djerdap group was the earliest (in the Neolithic) to engage in regional exchange for the acquisition of high quality flint from the Pre-Balkan platform (Radovanović 1997). A promoter of the alternative view is J. Šarić, who argues with the adherents of the conventional view that so-called BF originates only from sources in north (eastern) Bulgaria, claiming that such sources may exist in the area of Vrška-Čuka-Miroč (in eastern Serbia) (Šarić 2003).

As regards Neolithic Greece C. Perlès' research and publications must be taken into

2 C. Bonsall, A. Boroneant: The use of 'Balkan flint' in the Early Neolithic of the Romanian Iron Gates.

3 A collaborative paper of V. Bogosavljević-Petrović and D. Borić was presented at the BF session, 2009: Visual and technological allure of yellow-spotted flint in the Neolithisation of the central Balkans

consideration (Perlès 1992; 2001; 2004). Perlès claimed 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". Perlès further observes that the ... "Larger, heavier 'sickle-blades' of honey or yellow flints were imported and always as blades rather than cores. The origin of these blades is still unknown: the west coast is the most likely candidate, but the quarries have still to be found" (Perlès 2001, 2002). Quite challenging but still not sufficiently incorporated with the BF problem and its relation to 'macroblade' production (best represented by the assemblages of the Karanovo I culture in Bulgaria) is the presence of 'silex blond' among the very Early Neolithic material from Franchthi (with a gradual increase in frequency in the Middle Neolithic strata – Perlès 2004, 26) and several pieces in the Upper Mesolithic from Klisoura Cave (Argolid) (Kaczanowska et al. 2008). The recent research of G. Kourtessi-Philippakis on numerous Neolithic sites in northern Greece will undoubtedly contribute to clarifying the picture for Greece⁴.

For later periods the presence of 'silex blond', or 'honey-brown flint', is mentioned by other authors such as L. Manolakakis based on her study of Chalcolithic assemblages from northeast Bulgaria (the best known of which is the Varna cemetery) and the Greek site of Sitagroi, and R. Tringham who also has been engaged with the Sitagroi assemblages (Manolakakis 2005; see also Tringham 1984). It is very important to emphasize that this type of flint (pronouncedly brownish flint with a zonal pale striped structure and very smooth fracture) without doubt originated in the Ludogorie region in northeast Bulgaria and shows optimal quality for knapping technology and blade production, which reached its apogee in the superblade phenomenon of the final Copper Age. Apart from its macroscopically different features in comparison with BF discussed above, the flint confusingly but reasonably called in French 'silex blond', and coming from Chalcolithic contexts has surely identified geological age and outcrops that are located exclusively in Ludogorie Plateau in the form of primary (hosted in Lower Cretaceous micrite limestones) and secondary (placer) deposits (Начев 2009). Thus, this flint is not relevant to the present discussion, of the Early Neolithic processes of identities' integration, BF emergence and network exchange patterns.

As for Turkish Neolithic sites – seven artefacts of BF, representing formal tools (see below) are attested in phase 2 of Hoca Çeşme (contemporaneous with the Karanovo I culture in Bulgarian Thrace)⁵. Another two pieces of the same appearance have no stratigraphic position (Gatsov 2009, 77-78). Among the illustrations of the Aşağı Pinar material there are three retouched blades quite similar to formal tools. They are attributed, respectively, to periods 2/3 and 4 of the site (corresponding to Middle and Late Neolithic in terms of Bulgarian periodization), but no specific description is available, although the artefacts are quite unusual within the whole assemblage (Gatsov 2009, fig. 38/8, 43/9, 44/1).

Following the diffusion of the Starčevo-Criş-Körös cultural complex into the Carpathian basin, E. Starnini, studying the chipped stone assemblages from Méhtelek-Nádas (Körös Culture) refers to honey-coloured flint with white spots, which she calls "Banat" flint, originating from the western Banat, or (citing the work of the Kaczanowska & Kozłowski team) from the Pre-Balkan plateau (Starnini 1993, 70). More recently the presence of this flint

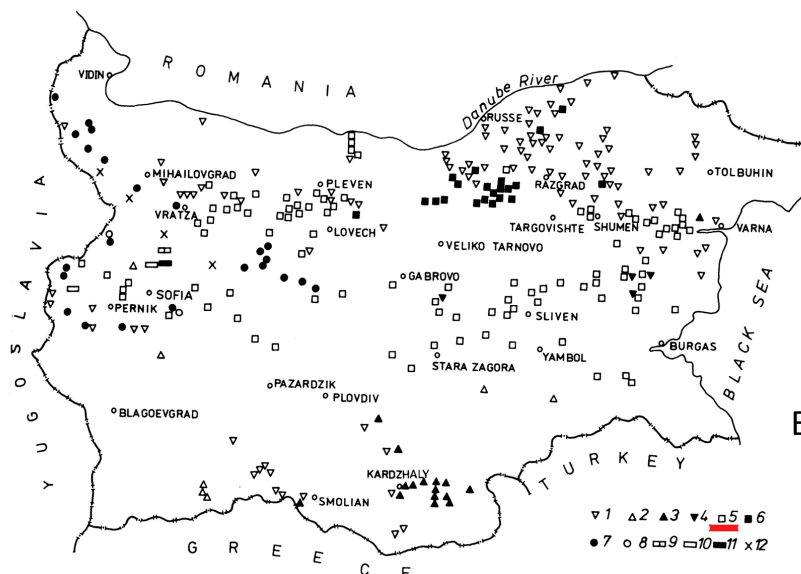
4 The paper presented by G. Kourtessi-Philippakis at the Bf session was entitled: Honey 'Balkan flint' in Northern Greece Neolithic: Presumptions and realities.

5 Several years ago (during the visit of Guner Gosconsu in Sofia) I had the opportunity to see directly four of those artefacts and without any hesitation confirm their belonging to BF formal tools of Karanovo I-II cultural complex.



A

6. Siliceous Rocks in Bulgaria



B

FIGURE 6.2. Geographic distribution of siliceous rocks in Bulgaria. (1) Quaternary: chert pebble. (2) Miocene and Pliocene: diatomite. (3) Upper Eocene and Oligocene: silicified limestone, bedded chert, agate, and diatomite. (4) Paleocene: spongolite. (5) Upper Cretaceous: nodular chert, spongolite, radiolarite, jasper, and silicified limestone. (6) Lower Cretaceous: nodular chert and calcareous chert. (7) Jurassic: nodular chert and radiolarite. (8) Triassic: nodular chert. (9) Upper Carboniferous: siliceous shale. (10) Lower Carboniferous and Devonian: bedded chert and siliceous shale. (11) Devonian and Silurian: bedded chert and siliceous shale. (12) Cambrian: metachert.

Fig. 1. Figure 1. A – map of the distribution of flint-bearing rocks in Bulgaria (according to Начев и др. 1981, 42); B – map of the distribution of siliceous rocks in Bulgaria (according to Nachev, Nachev 1988, 83)

Обр. 1 А – карта на разпространението на кремъчни скали в България (според Начев и др. 1981, 42); В – карта на географското разпространение на кремъчните скали в България (според Nachev, Nachev 1988, 83)

among assemblages from Méhtelek-Nádas has been considered as “probably traded” from the Moesian Platform in northern Bulgaria in the form of tested nodules (Biagi, Starnini 2010b, 120).

It is obvious that not every reference/allusion to 'Balkan flint' refers to only one or identical types of flint and the problem of identification and adequate use of the label 'Balkan Flint' gradually acquires new and confusing aspects requiring clarification and additional information. Since the 'homeland' of BF (and the problem associated with it) is Bulgaria, I shall now focus on the state of research into BF in my country.

A brief historiographical review of the Bulgarian research

The first scholar to formulate and highlight the importance of a systematic approach to the flint raw material in the context of intensified archaeological research in prehistory was Kǎncho Kǎnchev in his publication on problems and purposes of flint studies (КЪНЧЕВ 1978). His surveys carried out with the mineralogist I. Nachev led to the identification of 224 raw material outcrops in Bulgaria (data relating to 1978). The biggest concentration of flint sources occurred in three districts in north Bulgaria: Razgrad – 32 outcrops, Russe – 27 and Pleven – 24 (КЪНЧЕВ 1978, 87). An important result of the fruitful collaboration of this team was the presentation of the geographical and geological distributions of the siliceous rocks that concludes: “Flint rock deposits, displaying ample evidence of ancient and more recent exploitation were found in: Kriva Reka village, Shumen district in Chukata village near Razgrad, in the villages of Dryanovets, Nedoklan, Ossenets, Tetovo and Krivnya, Razgrad district; in the villages of Musselievo, Sadovets and Nikopol, Pleven district; in the villages of Mramoren and Chiren, Vratsa district and the village of Izbegli, Plovdiv district (Начев *et al.* 1981, 58) (fig. 1A). In fact, it is the most fundamental and synthetic work ever done on the topic (including data on the chemical composition of the siliceous rocks). A particular study was devoted to the Izbegli deposit (Nachev 1984), and the numerous and abundant flint deposits in north-eastern Bulgaria, which were identified as Aptian primarily bonded in Cretaceous limestones and consequently transformed by resedimentation to Quaternary (secondary) placers with rounded concretions (Nachev & Kǎnchev 1984). In 1988 an instructive study was published about the siliceous rocks in Bulgaria in the correlative perspective of their geographic, geotectonic and stratigraphic (geological) distribution, as well as their mineral/chemical composition, diagenesis and evolution. The authors, two geologists/mineralogists – Nachev senior and Nachev junior, are deeply involved in the research of rocks as raw material for prehistoric assemblages used by human populations and commonly called by archaeologists 'flint' assemblages (Nachev, Nachev 1988). The map prepared and published by the authors is still the most complete as for the geographic distribution of siliceous rocks in Bulgaria (fig. 1B).

Another branch of flint research took place in the 1980s, in the context of the Bulgarian-Polish-French investigation at Temnata Cave in the north-western karst of Bulgaria; the mineralogist from the Polish team, M. Pawlikowski carried out an investigation of raw materials and its supply strategy in relation to the Palaeolithic inhabitants of the cave. His conclusions about flint types may be summarized as follows: “The source of the wax-yellow BG-Te-F4 flints remains unknown. Field studies and the distribution of artefacts during the Early Neolithic allow to suggest its origin from north-western Bulgaria, south-western Romania or north-eastern Yugoslavia (Iron Gate area). This hypothesis must be supported by more detailed field investigations” (Pawlikowski 1992, 286). In fact, this is one of the



Fig. 2. Artefacts of 'Balkan Flint' from the Early Neolithic site of Kovačevo: 1 – blades and formal tools, 2 – sickle blades. Photo by M. Gurova

Обр. 2. Артефакти от 'Балкански флинт' от раннонеолитното селище Ковачево: 1 – пластини и диагностични оръдия; 2 – елементи от сърп. Снимки – М. Гюрова

most specific professional observations about what is called BF, but unfortunately after Pawlikowski's research. no subsequent researcher was sufficiently motivated or capable of continuing the reasonable approach initiated by him. I. Gatsov has studied and published Neolithic sites from western Bulgaria and used Pawlikowski's suggestion of a north-west-



Fig. 3. Artefacts of 'Balkan Flint' from the Early Neolithic site of Yabalkovo: 1, 2, 4 – typical formal tools, 3 – sickle blades. Photo by M. Gurova

Обр. 3. Артефакти от 'Балкански флинт' от раннеолитното селище Ябълково: 1, 2, 4 – типични диагностични оръдия; 3 – елементи от сърп. Снимки – М. Гюрова

ern origin of this "high quality yellow (or wax-coloured) flint with white or grey spots" (Gatsov 1993, 40-41).

For the past three years the present author has paid particular attention to the BF problem in the context of more general research on the Early Neolithic flint assemblages from Bulgaria, and tried to argue its importance in the context of (supra)regional cultural (ex) changes attested alongside the Neolithic emergence in the eastern Balkans (Гюрова 2009; Gurova 2008; 2011; forthcoming). A promising collaboration has been established with the mineralogist Ch. Nachev⁶ and in the meantime a couple of articles have been published so far introducing important sedimentological and petrological information on the flint sources in Bulgaria and their potential/actual archaeological uses, as well as the eventual provenance of the BF (Начев 2009; Gurova, Nachev 2008) (see below).

'Balkan Flint' provenance: approaches, issues and obstacles

As explained and argued in more detail in some previous works by the present au-

6 "Earth and Man" National Museum, Sofia



Fig. 4. Artefacts (most formal tools) of 'Balkan Flint' from the Early Neolithic settlements as follows: 1 – Rakitovo, 2 – Slatina. Photo by M. Gurova

Обр. 4. Артефакти (основно диагностични оръдия) от 'Балкански флинт' от раннонеолитни селища както следва: 1 – Ракитово, 2 – Слатина. Снимки – М. Гюрова

thor, BF is inherently connected with Early Neolithic flint assemblages and particularly with a category of flint artefacts (constituting formal toolkit) that belong to the full Neolithic package of the Karanovo I and II cultures. The chronological framework of this 'classical' Early Neolithic is c. 6000 to 5500 cal BC (Boyadziev 1995, 179). This particular toolkit is distinct for the following reasons: it corresponds to Andrefsky's definition of 'formal tools' including ... "special raw material, advanced preparation, anticipated use, and transportability" (Andrefsky 1994, 22) and represents a very diagnostic feature of the Early Neolithic flint assemblages in Bulgaria (and particularly for the Karanovo I-II cultures), as well as one of the characteristics of the supra-regional techno-complex of Karanovo I–Starčevo–Criș-Körös cultural unit.

These toolkits, coming from the biggest Neolithic tell settlements like Karanovo, Azmak and Kapitan Dimitriev (in Thrace), as well as from other important Early Neolithic sites (Kovačevo, Yabalkovo, Slatina, Rakitovo etc.) are entirely made of BF (figs. 2, 3 and 4). Typologically, these toolkits consist mostly of medium to long (the longest are in the range of 12-15 cm), regularly-shaped blades, 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 which is the reason to affiliate to this toolkit the sickle inserts (even on unretouched blades) with visual polishes and heavily used working edges (fig. 5). From a technological point of view, this industry indicates the application of indirect percussion (punch technique) with pressure flaking applied for the high and steep retouching. It must be stressed that no, or very few, cores and core-preparation debitage are attested among the assemblages. In this sense, no opportunity for any diacritic concept of '*chaîne opératoire*' reconstruction is available. The complex of distinctive traits of these toolkits permits their consideration as one of the diagnostic elements/hallmarks of the Early Neolithic cultural complex (Gatsov 1993; Гурова 2005; Gurova 2004; 2008; forthcoming). Unavoidably, the question arises about the provenance of the BF that served for manufacturing the diagnostic toolkits being a feature of the 'full Neolithic package' that was just as important as the white painted pottery for the Karanovo I culture.

As already noticed by the present author, formal toolkits are still not clearly documented among the assemblages from Early Neolithic sites of central and west-north Bulgaria, but BF artefacts are largely attested both within Ohoden and Dzhuljunitsa site flint assemblages (fig. 6) (Gurova 2008; Zlateva-Uzunova 2009).

Decades ago, K. Kanchev studied the Early Neolithic flint assemblages from tells Chavdar and Kazanlak (rich in BF and formal tools). The microscopic petrographical expert analyses, made by I. Nachev allowed Kanchev to establish the locations of flint outcrops in the Ludogorie area (north-eastern Bulgaria)⁷.

Gatsov (1993) presumed north-west Bulgaria to be the region of provenance of the raw material used for Early Neolithic assemblages from western Bulgaria (Gatsov 1993, 40-41). At the same time the Russian specialist N. Skakun as author of a part in Gatsov's book noticed that "separate specimens are probably made of Dobrudzha flint" (Skakun 1993, 54).

Two general types of flint were recognised among the assemblages from Tells Ka-

7 The mentioned sites are among the most important and representative components of the Early Neolithic culture in Bulgaria. Unfortunately the monographs of K. Kanchev remain unpublished. Hopefully an article with the results of thin-section analysis from Tell Kazanlak is envisaged to be published by Ch. Nachev

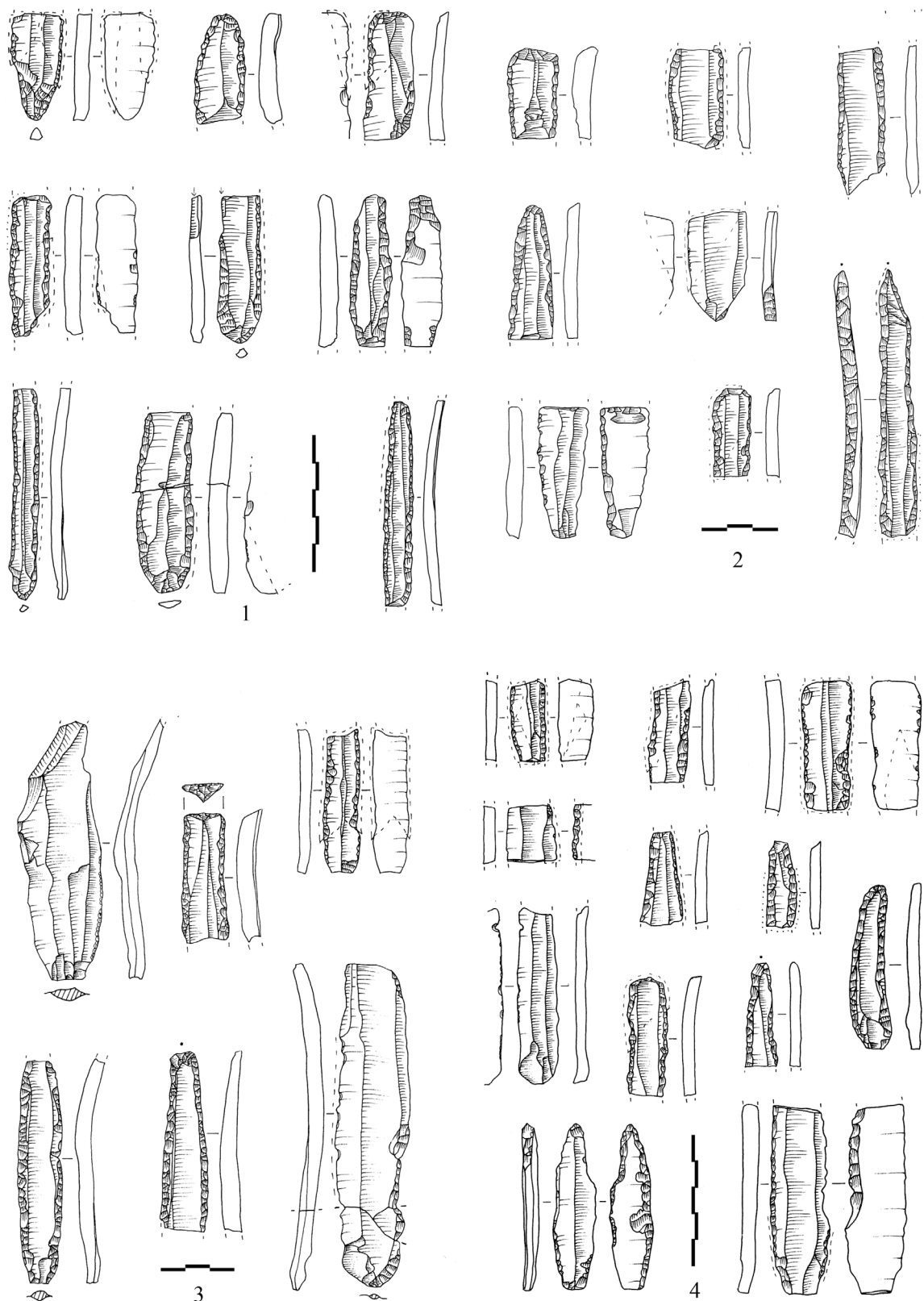


Fig. 5. Typological features of Early Neolithic flint assemblages (and particularly formal toolkits): 1 – Yabalkovo, 2 – Rakitovo, 3 – Slatina, 4 – Kovachevo. Drawings by M. Gurova

Обр. 5. Типологически характеристики на раннонеолитни кремъчни ансамбли с диагностични оръдия: 1 – Ябълково, 2 – Ракитово, 3 – Слатина, 4 – Ковачево. Рисунки – М. Гурова



Fig. 6. Artefacts of 'Balkan Flint' from the Early Neolithic settlements as follows: 1 – Dzhuljunitsa, 2 – Aria Babi (Serbia), 3 – Ohoden. Photo by M. Gurova
Обр. 6. Артефакти от 'Балкански флинт' от раннонеолитни селища както следва: 1 – Джулюница, 2 – Ариа Баби (Сърбия), 3 – Оходен. Снимки – М. Гюрова

ranovo and Azmak and in fact type A represents our BF. The investigation was done by I. Gatsov and the geologist V. Kurčatov who suggested that the abundance of artefacts was due to the proximity of local outcrops and identified them (more theoretically than actually) in the region of the Sveti Ilia Hills in eastern Thrace, not very far from the tells (Gatsov, Kurčatov 1997, 215). This assumption has been quoted repeatedly, but never substantiated by convincing arguments and further serious research, and now it could be considered as disproved.

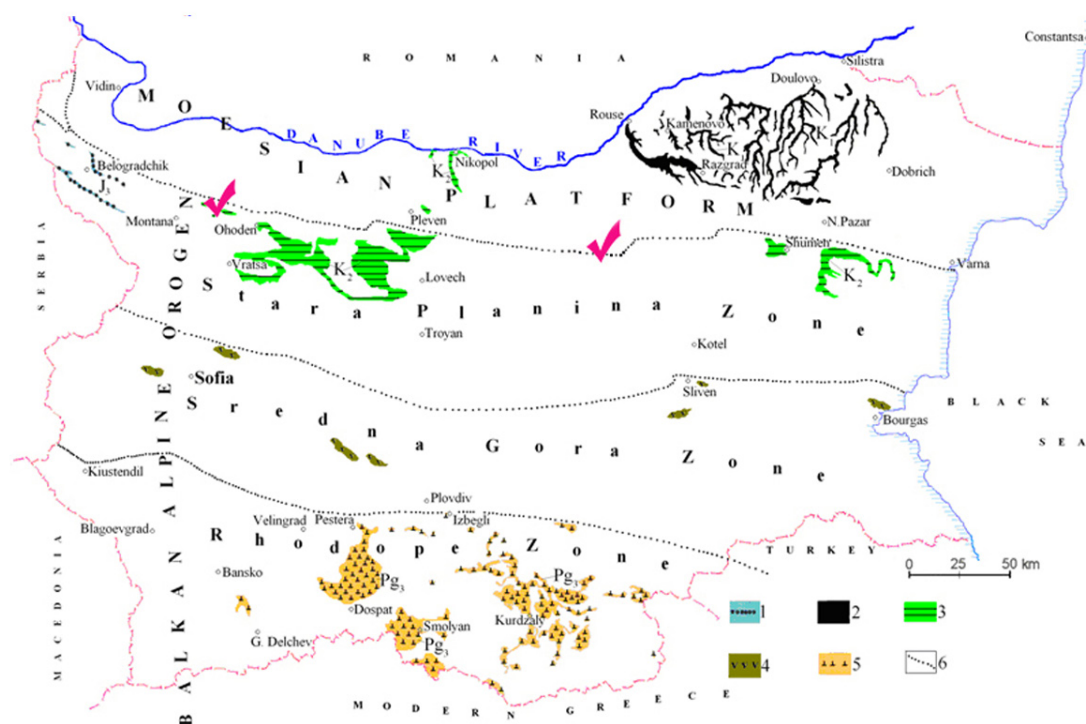
Subsequently many and variable interpretations of BF provenance have been promoted on the basis of numerous superficial visual observations and macro comparisons.

Preliminary research on a series from Yabalkovo led R. Zlateva-Usunova, to distinguish 11 raw material varieties: "...the predominant raw material with identified origin comes from deposits in the Upper Thrace, the Sredna Gora region... followed by deposits in North Bulgaria and the Eastern Rhodopes..." (Leshtakov et al. 2007, 201). It is not clear from her work where the abundant formal tools of BF from Yabalkovo originated. The same author describes two types of flint raw materials from the 'monochrome' Neolithic site of Ohoden (beige-wax to yellow with whitish spots, respectively BG.Oh.F5 and BG.Oh.F6) as presented mainly within tools and blades and as originating from the Razgrad region in Dobrudzha (Zlateva-Uzunova 2009, 72). It is noteworthy that on the basis of the description those types are seemingly identical to the Yabalkovo site raw material, discussed above (see fig. 3).

In fact, more recently, apart from some correct conjectures of Natalia Skakun, the first to argue, somewhat theoretically, for a north-eastern provenance of the raw material used for the Neolithic big blades and their exchange was Ts. Tsonev. He promoted that origin in the context of his theory about the role of long blades in "communal perception of long distance exchange through common metaphors" (Tsonev 2004, 262). On the other hand among the Neolithic flint material from the site of Katchitsa (near Dzhuljunitsa) in central-north Bulgaria, Ts. Tsonev distinguishes a type of flint described as BG-Kc-F7 (yellow-brownish white spotted and semi-translucent), corresponding to the type BG-Te-F4 (after M. Pawlikowski), i.e. seemingly identical with BF (at least based to the macroscopic description!). According to Ts. Tsonev this flint comes most likely from Lower Cretaceous deposits in the Lovech-Tarnovo anticline or from raw material outcrops in north-eastern Bulgaria (Цонеv 2009, 24). As the first suggestion, according to description of Ch. Nachev, the bedded siliceous rocks along the Yantra river are the most western deposits of Ludogorie type of flint and might be suitable for artefact manufacture. On the other hand their fracture (knapping potential) is too low to have been efficiently and regularly used by prehistoric knappers (Начев 2009, 11; Gurova, Nachev 2008, 34). As for the second possibility (Ludogorie provenance) of this type of flint - it is possible, but still insufficiently proved (see below).

My personal macroscopic observations allowed me to think that the Ludogorie flint is macroscopically the most similar to Early Neolithic BF toolkits. An additional argument can be drawn from the fact that up to the present day, there are many secondary flint deposits, easily recognisable and accessible in pits for flint acquisition during historical periods (certainly up the early decades of the twentieth century for the manufacture of *tribulum* inserts – in Kriva Reka village, for example) (Gurova 2008, 121).

In this situation of total discrepancy about the provenance and supply of BF, a small-scale research project was initiated by the author in collaboration with the mineralogist Ch. Nachev. His intention to make clearer to archaeologists the flint raw materials as particular subject of prehistoric research agenda resulted in quite instructive publications, illustrating



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. 7. Geological map of main type's flint-born rocks in Bulgaria. Additional pink marks are put on Dzhuljunitsa and Ohoden sites (adapted from Gurova, Nachev 2008, fig. 5).

Обр. 7. Геологическа карта на основните типове кремъчносъдържащи скали в България. Допълнително обозначени са селищата Джулюница и Оходен (адаптирана от Gurova, Nachev 2008, fig. 5)

the parameters and particular features of the geologically distinguished four main types of flint concretions on the basis of their comparative analysis (Начев 2009). As noticed by Nachev significant accumulations of siliceous/flint concretions are located in the Moesian Platform and adjacent parts of the Balkan Alpine Orogen. The term "Pre-Balkan Platform" is considered an incorrect term for the Moesian Platform from which "Balkan flint" probably means every flint in the Moesian Platform and adjacent parts of the Balkan Alpine Orogen including both Lower Cretaceous (Aptian) flint and Upper Cretaceous (Campanian and Maastrichtian) flint (Gurova, Nachev 2008, 32) (fig. 7). There are two main flint strata that are promising from an archaeological point of view for resolving the problem of BF provenance: Moesian and Ludogorie flints. For this reason a short summary description of their characteristic features is useful (the information is taken from Nachev's part of the collaborative article mentioned above).

The silica concretions of the *Moesian flint* are hosted in the Upper Cretaceous (Campanian) chalk, chalk-like limestones and fine grained biomorphic limestones (Maastrichtian).

— The colour of the concretions is brown, pale brown and grey, with a massive and spotted

structure (brown with pale grey spots). Concentric-zonal structure is very rare.

- The size is mainly 15-35 cm. The shape is extremely irregular, with many branches (amoeba-like). Macroscopically distinctive features are very often large relics from chalky limestones that are occasionally dissolved, with dimensions up to 10 cm.
- The cortex is thin (1-2 mm), white, containing chalk, and with silica-carbonate composition. The fracture is rough to smooth. The natural polish and yellow patina are typical for palaeo and recent alluvial depositions.
- The mineral composition is a micro and cryptocrystalline chalcedony (up to 75%), moganite (up to 25%), opal, quartz (2-3%) and framboidal pyrite.
- Microscopic observations reveal micro- to crypto-groundmass and an abundance of lightly fragmented and chaotically distributed microfauna.
- Moesian flint forms three large areas of outcrops in north Bulgaria, from west to east as follows: between Montana and Lovech, between Pleven and Nikopol and between Shumen and Devnya in north-eastern Bulgaria.

The silica concretions of Ludogorie (or Dobrudzha) flint are hosted in Lower Cretaceous (Aptian) micrite limestones with pale grey colour.

- The colour of the concretions is predominantly pale brown or yellow-beige, very rarely grey with whitish intrusions. Very often it shows concentric-zonal structure (pale brown, reddish and grey stripes).
- The size varies from 1 to 50 cm commonly between 5 and 15 cm, very rarely 30-50 cm.
- The shape is regular – approximately ellipsoidal, and rarely rod-like.
- A distinctive feature is the white silica-carbonate cortex, 6-12 mm thick, in separate specimens with onion weathering. The intercalations are very rare, small (1-5 mm), round, with a pale cream colour.
- The fracture is smooth (in brown and beige varieties), conchoidal or cone-shaped in separate parts of the specimens.
- Biocomponents are only sponge spicules which are fully silicified.
- The Aptian flint has a broad geographical distribution in north-eastern Bulgaria, to the north of Novi Pazar and between the meridians of Rouse and Dobrich. The main outcrops are near Vetovo, Koubrat, Razgrad, Ispirih and Novi Pazar.

My collaboration with Ch. Nachev presumed accumulation of archaeological samples from the main Early Neolithic sites in Bulgaria with the purpose of comparative thin-section analysis with samples from flint outcrops in north Bulgaria and eventual identification of the raw material provenance of the archaeological specimens. The first three samples were taken from Dzhuljunitsa, Rakitovo and Yabalkovo sites and show typical cryptocrystalline structure and microfaunal remains. Subsequently the samples from three new Bulgarian sites and a very interesting Early Neolithic site (Aria Babi) in the Serbian Iron Gates area were included (figs. 8 and 9). The analyzed samples are presented in table 1.

Raw materail samples		
Somovit	1	Moesian Platform – K2 Campanian
Ravno	2	Moesian Platform – K1 Aptian
Goliam Porovets	3	Moesian Platform – K1 Aptian
Kriva Reka (x2)	4	Moesian Platform – K1 Aptian
Kamenovo	5	Moesian Platform – K1 Aptian
Archaeological samples		
Kovačevo (x2)	1	Early Neolithic
Yabalkovo	2	Early Neolithic
Slatina	3	Early Neolithic
Rakitovo	4	Early Neolithic
Ohoden	5	Early Neolithic
Dzhuljunitsa	6	Early Neolithic
Aria Babi	7	Early Neolithic (Serbia)

Table 1. Flint samples submitted for thin-section analysis

In fact the issue of this small scale thin-section analysis is not very promising and encouraging, but some realistic observations and conclusions could be resumed as follows⁸:

- *The distinction between all flint samples studied is problematic because of their common cryptocrystalline structure and very few (almost imperceptible) 'individualizing' features;*
- *Reliable identification of the raw material type of archaeological samples is not possible on the basis of comparative analysis of available thin sections;*
- *The flint samples from the Rakitovo, Slatina, Yabalkovo and Ohoden sites are probably derived from the 'Moesian' flint region;*
- *None of archaeological samples examined here could be related with confidence to the 'Ludogorie' outcrops, Kovačevo flint does not correspond to any known outcrop⁹.*

It should be stressed that an alternative microscopic observation and comment on the small thin-section collection was undertaken by the geologist Y. Stefanov¹⁰. He noticed fossils remains in four archaeological samples: from Rakitovo, Dzhuljunitsa, and both samples from Karanovo) as well as in the sample of raw material from Musselievo. Microfaunal remains were distinguished also in four archaeological samples – those from the sites of Yabalkovo, Ohoden, Slatina and Aria Babi (Serbia). The suggestion of Y. Stefanov was to initiate a microfaunal analysis of the samples that might give clearer indications of the geological age of the rock mass. The microfaunal analysis was made by Dr. D. Ivanova¹¹. The observations on this small collection can be summarized as follows: - strong secondary recrystallisation masking fossils and making their identification difficult; - only one well-

⁸ Some preliminary results are partially published in Gurova, Nachev 2008, but the synopsis here is made by the present author on the basis of personal communication with Ch. Nachev

⁹ Part of this conclusion is published in the common article Gurova, Nachev 2008, part of it is personal communication

¹⁰ Geology Department, Sofia University

¹¹ Department of Palaeontology, Stratigraphy & Sedimentology, Geological Institute, Bulgarian Academy of Sciences

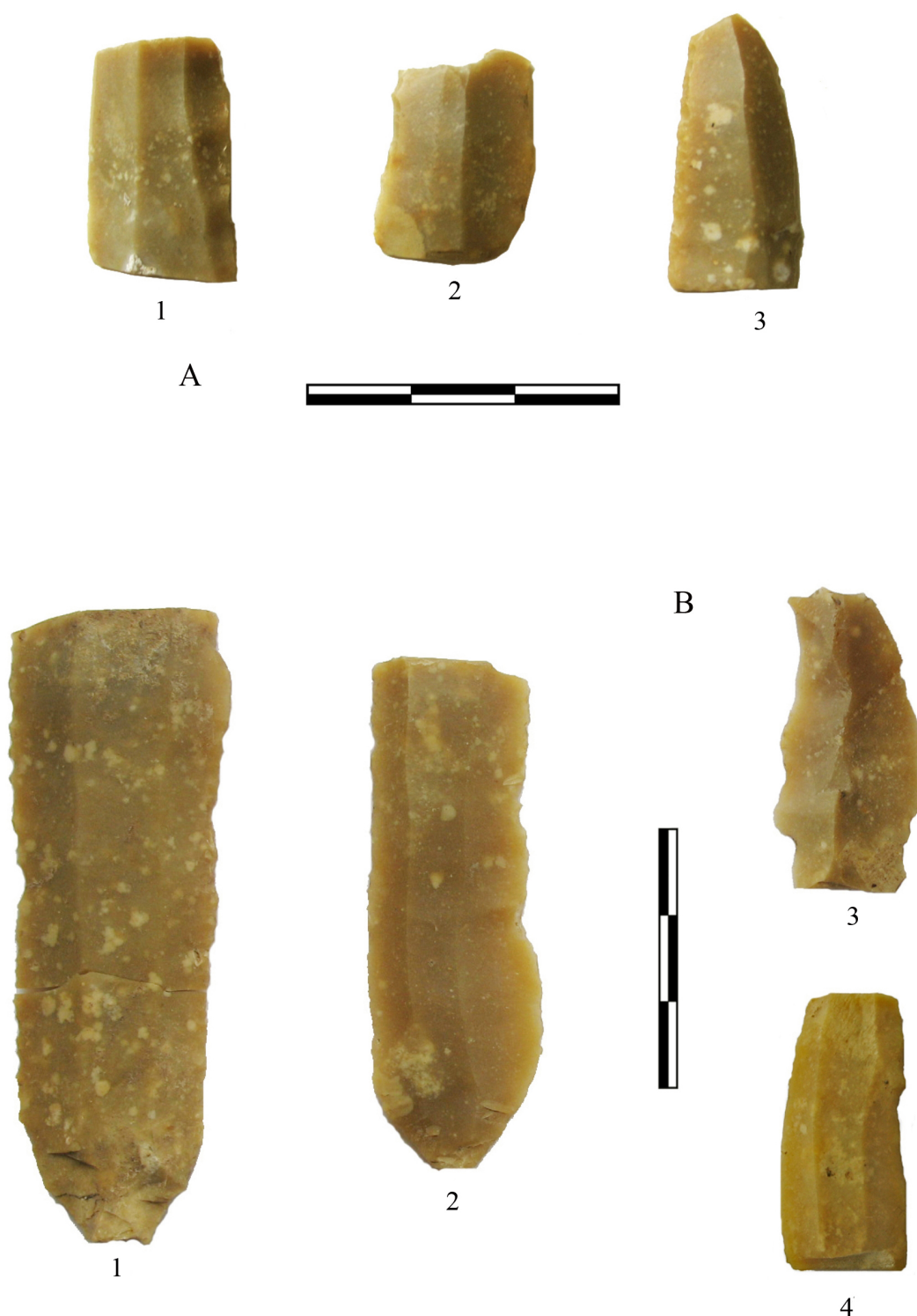


Fig. 8. 'Balkan Flint' archaeological samples from Early Neolithic sites in Bulgaria (with one exception) submitted to thin-sections analysis. A: 1 – Dzhuljunitsa; 2 – Rakitovo; 3 – Yabalkovo.

B: 1 – Slatina; 2 – Aria Babi (Serbia); 3 – Ohoden; 4 – Kovačevo. Photo by M. Gurova.

Обр. 8. Археологически образци от 'Балкански флинт' от раннонеолитни селища в България (и 1 образец от Сърбия), анализирани чрез дюншлифи: А: 1 – Джулюноца; 2 – Ракитово; 3 – Ябълково. В: 1 – Слатина; 2 – Ариа Баби (Сърбия); 3 – Оходен; 4 – Ковачево.

Снимки – М. Гурова

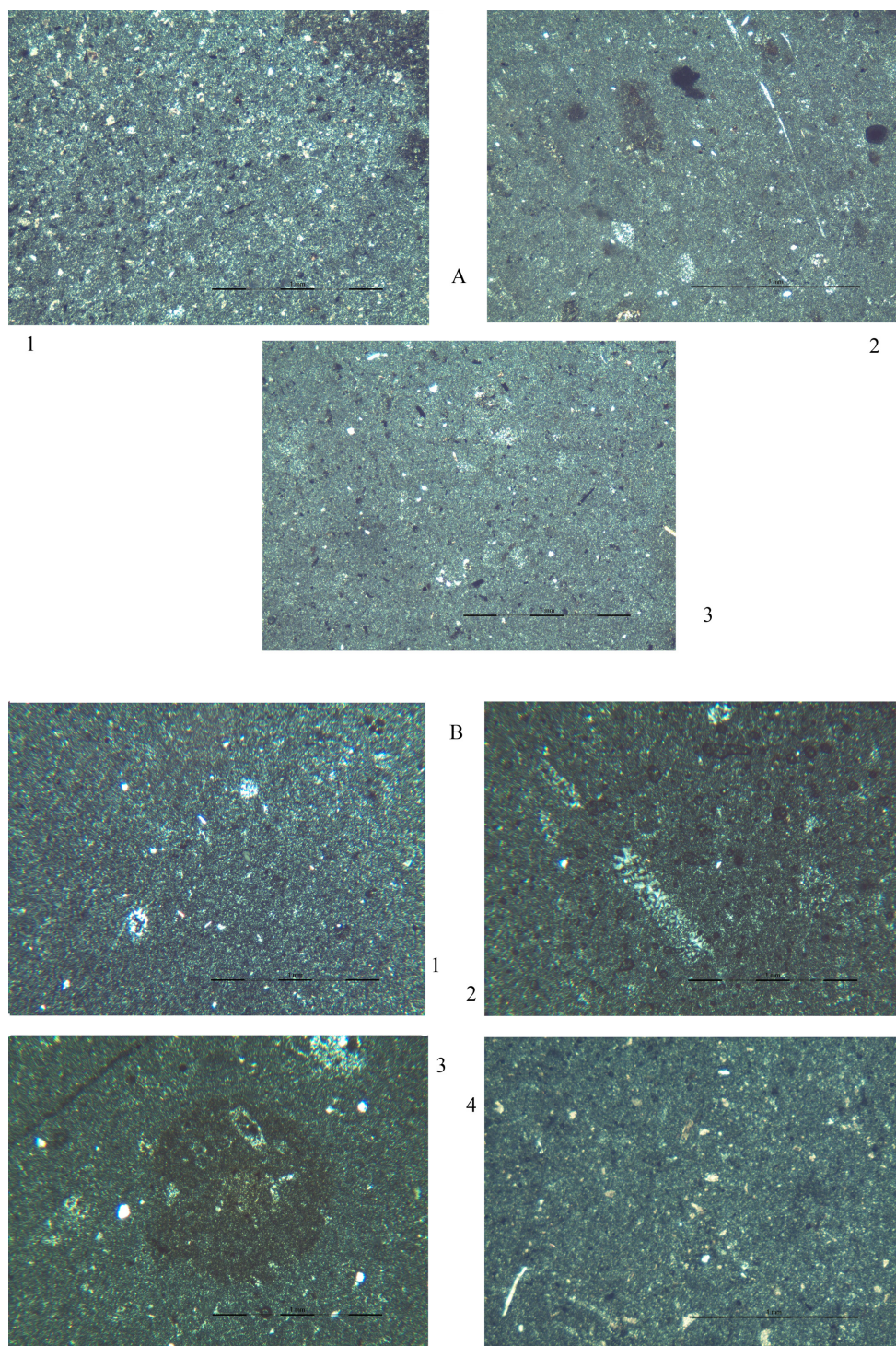


Fig. 9. Thin-sections of archaeological samples from the following sites – A (first series): 1 – Dzhuljunitsa; 2 – Rakitovo; 3 – Yabalkovo; B (second series): 1 – Slatina; 2 – Aria Babi (Serbia); 3 – Ohoden; 4 – Kovačevo. Figure by M. Gurova, thin-section photos - courtesy of Ch. Nachev (first published in Gurova, Nachev 2008)

Обр. 9. Дюншлифи на археологически образци от следните селища: А (първа серия): 1 – Джулјунца; 2 – Ракитово; 3 – Ябълково; В (втора серия): 1 – Слатина; 2 – Ариа Баби (Сърбия); 3 – Оходен; 4 – Ковачево. Колаж на М. Гурова, снимки – Ч. Начев (публикувани в Gurova, Nachev 2008)

preserved section of foraminifera (family *Verneulinidae Cushman*) has been established in the thin-section of the sample from Karanovo I horizon of the eponymous tell site. The section possesses triserial to biserial arrangement of the test; the wall is agglutinated. The representatives of this family have a wide stratigraphic range – from Pennsylvanian to Holocene; - siliceous *sponge spicules* in several thin-sections (raw material samples from Ravno, Kamenovo and Musselievo) were recognized.

Alongside the thin-section comparative analysis, a larger series of archaeological samples from Early Neolithic sites and geological samples from outcrops of Moesian and Ludogorie flints were given to C. Bonsall¹² for more reliable characterization of BF sources by trace element analysis using laser ablation inductively coupled plasma mass spectrometry (LA-ICP-MS) and electron probe micro analysis (EPMA) (figs. 10 and 11). It is noteworthy that apart from Bulgarian Early Neolithic samples, two samples from Iron Gates region are added - from Aria Babi in Serbia and Schela Cladovei in Romania. The analyzed samples are presented in table 2.

Raw materail samples		
Mramoren	1	Balkan Orogen – K2 Campanian
Somovit	2	Moesian Platform – K2 Campanian
Nikopol	3	Moesian Platform – K2 Campanian
Mouselievo	4	Moesian Platform – K2 Campanian
Ravno	5	Moesian Platform – K1 Aptian
Drianovets	6	Moesian Platform – K1 Aptian
Goliam Porovets	7	Moesian Platform – K1 Aptian
Kriva Reka	8	Moesian Platform – K1 Aptian
Shumen	9	Moesian Platform – K2 Campanian
Archaeological samples		
Kovačevo (x2)	1	Early Neolithic
Ohoden	2	Early Neolithic
Slatina	3	Early Neolithic
Dzhuljunitsa (x2)	4	Early Neolithic
Yabalkovo (x2)	5	Early Neolithic
Schela Cladovei	6	Early Neolithic (Romania)
Aria Babi	7	Early Neolithic (Serbia)

Table 2. Flint samples submitted for trace element analysis
(according to the detailed original table in Bonsall et al. 2010, 12)

Precise sampling provenance is shown on the map (fig. 12). The preliminary results of this approach are presented in the recently published collaborative paper (Bonsall et al. 2010). The observations of this pilot study (although inconclusive) are significant and it is worth emphasizing again that: “(i) the archaeological ‘Balkan Flint’ samples are unlikely to be from a single source; (ii) the two artefacts from Kovačevo in southwest Bulgaria almost certainly came from different geological sources; (iii) the majority of the geological samples analysed differ macroscopically and/or geochemically from the Neolithic ‘Balkan Flint’ artefacts included in the pilot

¹² This research was done as part of a pilot study of ‘Balkan’ flint sources and exchange networks in Neolithic SE Europe

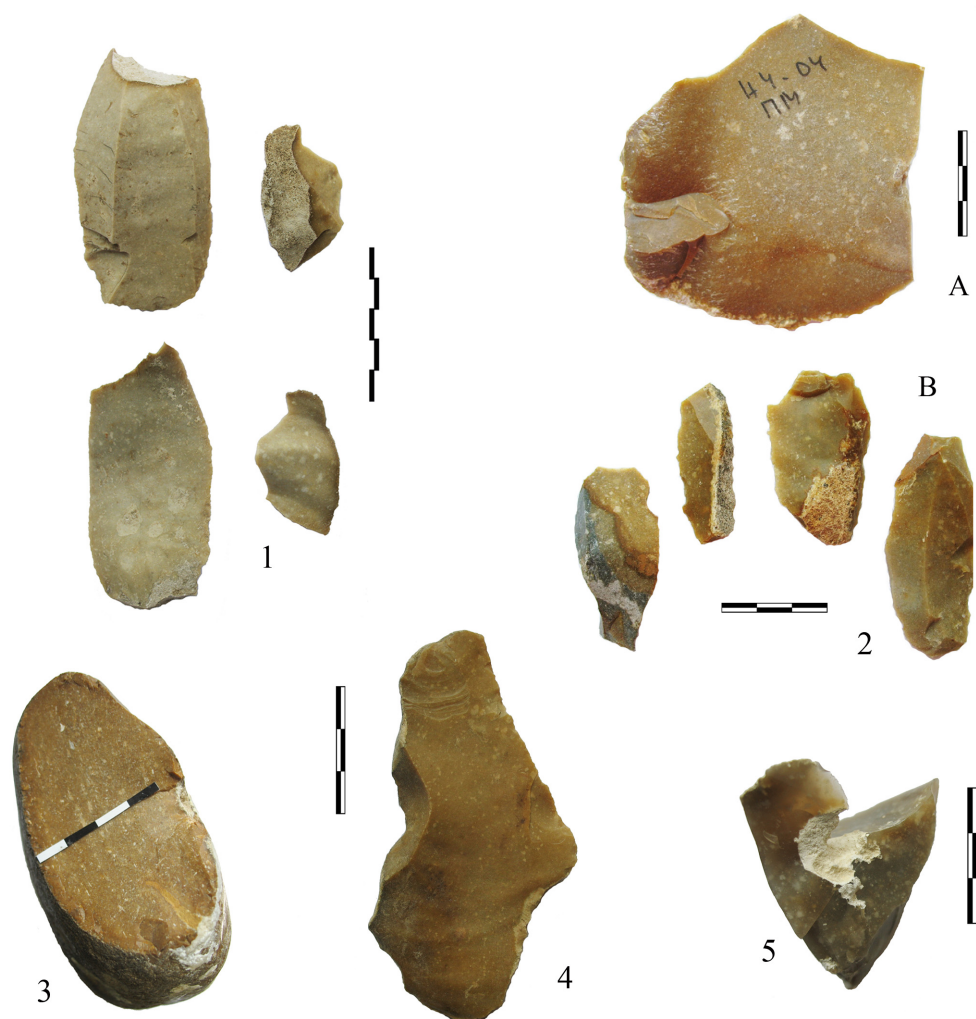


Fig. 10. 'Balkan Flint'-like visual features of geological samples: 1 – Flint samples from vicinity of Musselievo (near Nikopol - surface finds of local RM deposits), 2A – flint from Chakmaka outcrops (near Isperrich); 2B – flints from Kriva reka outcrops (near Novi Pazar), 3 – flint from Drianovets (Razgrad district); 4 – flint from Nikopol, 5 – flint from Shumen. Photo by M. Gurova.

Обр. 10. Геологически образци макроскопично близки до 'Балкански флинт': 1 – от Муселиево (материал от повърхността от локалното местонахождение), 2А – кремък от Чакмака (до Исперих); В – кремъци от Крива река (до Нови Пазар), 3 – образец от Дряновец (Разградско); 4 – образец от Никопол, 5 – образец от Шумен.

Снимки – М. Гюрова

study. 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).

It is noteworthy however that in spite of the optimal technical equipment and analytical procedure applied, the small number of samples analyzed did not allow for the determination of their sources with much certainty. In the hope of obtaining more satisfactory and definitive results about revealing the similarities/differences between archaeological samples, and between them and raw material samples, a new stage of the BF international



Fig. 11. Archaeological samples from Early Neolithic sites submitted to LA-ICP-MS analysis (Bulgarian sites 1–6 and 8–9). 1 – Slatina; 2 – Yabalkovo; 3 – Yabalkovo; 4 – Ohoden; 5 – Kovačevo; 6 – Kovačevo; 7 – Schela Cladovei (Romania); 8 – Dzhuljunitsa; 9 – Dzhuljunitsa; 10 – Aria Babi (Serbia) (first published in Bonsall et al. 2010, fig.4). Photo by M. Gurova

Обр. 11. Археологически образци от раннонеолитни селища анализирани с помощта на LA-ICP-MS. 1 – Слатина; 2 – Ябълково; 3 – Ябълково; 4 – Оходен; 5 – Ковачево; 6 – Ковачево; 7 – Скела Кладовей (Румъния); 8 – Джулюница; 9 – Джулюница; 10 – Ариа Баби (Сърбия) (според Bonsall et al. 2010, fig. 4). Снимки – М. Гурова

network was established. A new HRAR project entitled “Prehistoric flint sourcing in NW Bulgaria and NE Serbia: Field survey and laboratory analyses” awarded in 2011 by the America for Bulgaria Foundation (ABF) and co-ordinated by the American Research Centre in Sofia (ARCS)¹³. The project focuses on the identification of flint sources, used by prehistoric communities in the areas of northwest Bulgaria and northeast Serbia, by means of field survey and archaeometric analyses (fig. 13). The analytical approach combines geochemistry with petrographic observation of the polished thin sections for identification of trace element composition of the flints, and requires a significant number of comparative samples from natural flint deposits for obtaining reliable results.

¹³ The project is co-directed by M. Gurova (Sofia) and D. Borić (Cardiff) with the participation of archaeologists and geologists: S. Ivanova, M. Pawlikowski, E. Stefanova, P. Andreeva, D. Milovanović etc.

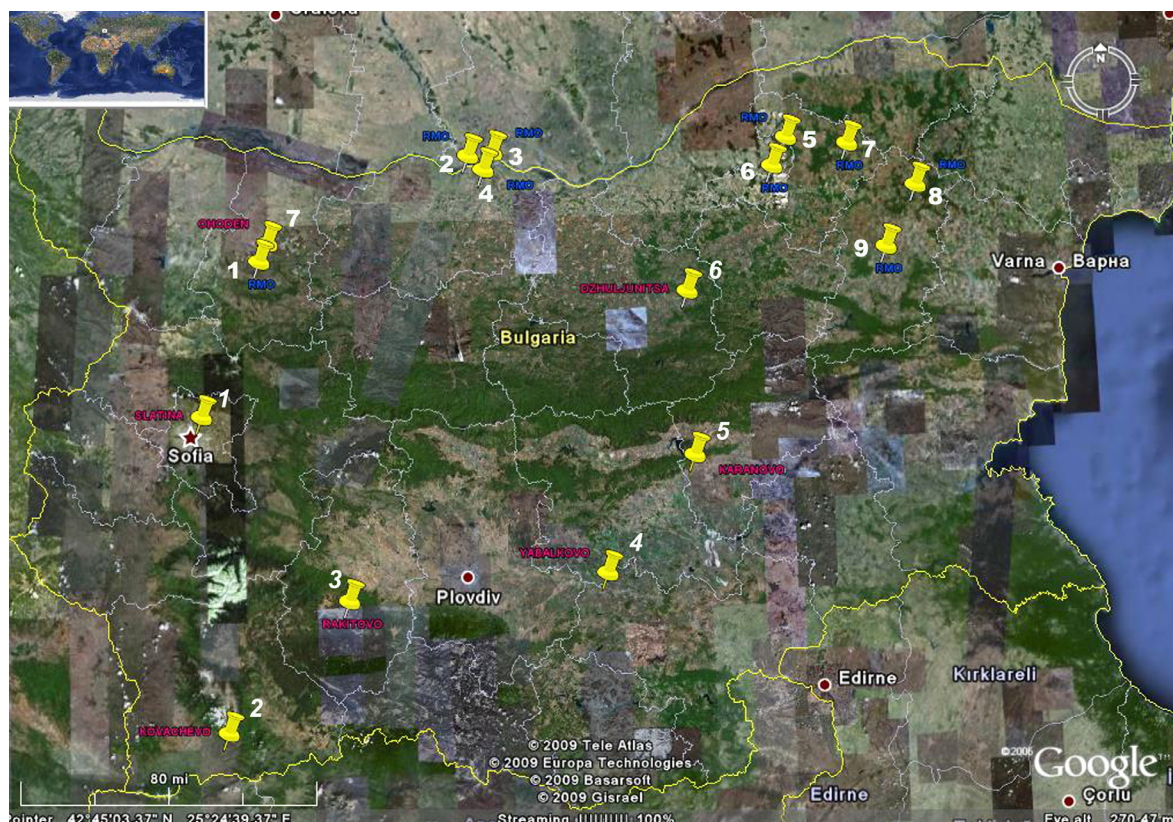


Fig. 12. Map of Bulgaria, showing the locations of geological (with bleu abbreviation RMO) and archaeological (with red names) samples taken for thin-section and LA-ICP-MS analysis. Flint outcrops: 1 – Mramoren, 2 – Somovit, 3 – Nikopol, 4 – Musselievo, 5 – Ravno, 6 – Drianovets, 7 – Chakmaka (Goliam Porovets), 8 – Kriva reka, 9 – Shumen. Archaeological sites: 1 – Slatina, 2 – Kovačevo, 3 – Rakitovo, 4 – Yabalkovo, 5 – Karanovo, 6 – Dzhuljunitsa, 7 – Ohoden

Обр. 12. Карта на България с локализираните геологически (със синя абривиатура RMO) и археологически (с червено изписани имена) обекти, откъдето са взети образци за дюншлифи и LA-ICP-MS анализи. Кремъчни местонаходища: 1 – Мраморен, 2 – Сомовит, 3 – Никопол, 4 – Муселиево, 5 – Равно, 6 – Дряновец, 7 – Чакмака (Голям Поровец), 8 – Крива река, 9 – Шумен. Археологически селища: 1 – Слатина, 2 – Ковачево, 3 – Ракитово, 4 – Ябълково, 5 – Караново, 6 – Джулюница, 7 – Оходен

On the other hand we cannot expect a convincing resolution of the BF provenance problem if analyses for determining the sources and artefacts from other neighbouring countries do not complete our initial efforts and modest results.

Considering the archaeological evidence
and anticipating the BF provenance

It is clear that in the present state of research no definitive answer is possible to the question of BF provenance. It is nevertheless worth summarizing and commenting on the plausible issues, whilst assuming their anticipative character.

- First of all the fact that the Moesian platform extends into eastern Serbia and south-western Romania, allows us to expect some outcrops of BF/BF-like raw materials in those



Fig. 13. Field survey for identification of flint deposits (2011): 1 – Ali Koch Baba (Nikopol) – flint concretions in hosted chalk-like limestones; 2 – on the road SW from Nikopol – flint concretions in hosted chalk-like limestones; 3 – Danube bank near Nikopol – secondary placer of flint concretions/nodules. Photo by M. Gurova

Обр. 13. Теренно проучване за идентифициране на кремъчни местонаходища: 1 – Али Коч Баба (Никопол) – кремъчни конкреции в кредни варовици; 2 – по пътя към Никопол (ЮЗ от града) – кремъчни конкреции в кредни варовици; 3 – брега на Дунав край Никопол – разсипни кремъчни конкреции и валуни. Снимки – М. Гюрова

regions too, as presumed by M. Pawlikowski and J. Šarić (Pawlikowski 1992; Šarić 2003). It is therefore important to initiate a serious study for locating and analysing materials from those (potential) sources.

- It is worth noting that the Moesian platform was, and continues to be, quite easily passable and in theory there would have been no obstacles to expeditions by prehistoric people looking for high quality flint sources (for supply and subsequent distribution/consumption). The navigable rivers traversing the Platform and flowing into Danube were presumably an easy way to reach the vicinities of the Moesian flint secondary deposits, concentrated in river valleys and terraces. The Danube is noted by Nachev as very suitable transport connection for the flint deposits from the Pleven-Nikopol region, where the Moesian flint is hosted in primary rocks and is of better quality (Gurova, Nachev 2008, 34). In fact for eventual distribution in a west/north-west direction (to the Iron Gates sites in Serbia and Romania) the area of Pleven-Nikopol is the most plausible as the BF supply zone. This zone could be easily presumed as a procurement and distribution centre for the Sofia plain (upstream along the Vit and Osam rivers and then west to the Iskar valley leading to Sofia), where the Early Neolithic site of Slatina is situated. From here easy trips to different destinations are envisageable and possible – to the south (following the Struma downstream and accessing the Neolithic sites on the Bulgarian and Macedonian sides), to the east – reaching Chavdar tell and probably continuing south-eastwards to the Thracian plain via numerous Maritsa river tributaries. The only (but serious) challenge in such a scenario is to make fitting altogether the available dates from the Early Neolithic sites concerned. This will be the next step of the author for approaching properly the problem, after obtaining the results from AMS and DNA analysis of bone samples from the Slatina site¹⁴.

- As for the famous tell sites in Thrace (Karanovo, Azmak, Kazanlak) – they are almost equidistant from both potential BF supply areas – Pleven-Nikopol and Ludogorie. Easy communication is feasible along the Yantra and Rusenski Lom river valleys and then via passes in the Stara Planina mountains and the Tundzha river' tributaries to penetrate from the Moesian platform to the northern periphery of the Thracian plain – the biggest arena of Early Neolithic culture manifestation and paraphernalia. What must be taken into consideration in that case is the fact that formal toolkits found in abundance at these tells suppose and require high quality flint, big nodules and advanced know-how in knapping technique for assuring the suitable big single platform cores and debitage of a series of regular blades in the range of 10-12 (rarely up to 15) cm. From this perspective, the deposits of Ludogorie flint in the Razgrad and Ispereh regions are thought to be more likely sources. This argument has been always considered as very prominent by the scholars-followers of the concept of Ludogorie as the 'homeland' of the raw material of the impressive Early Neolithic flint assemblages (formal toolkits).

- Among the proponents of Moesian flints from the Pleven-Nikopol area as the object of Early Neolithic exploitation, distribution and use, a very recent contribution to the BF problem deserves particular attention. In *Antiquity online*, a discovery of a BF workshop was published by P. Biagi and E. Starnini as a result of a 'study trip' (Biagi & Starnini 2010a). This discovery as a part of their view on the Neolithization of the Carpathian Basin has also been recently published in two different books under different titles but with practically identical content (P. Biagi, E. Starnini 2010b, 2011). Thus in a triple reproduction they describe an

14 The new data on Slatina are expected due to the generous help of V. Nikolov, who provided the samples and C. Bonsall, who is organizing the analyses.

‘accidental’ discovery made near Nikopol on the hill Ali Koch Baba (the name of the place is wrongly written in the publications) and consisting of an outcrop of BF and a scatter of artefacts: cores, blades, flakes and a single endscraper (the finds are listed with terms like few, many, several). The artefacts are carefully photographed and even drawn (difficult to envisage as a chance find in the field!) in contrast of the authors’ remark that because of the accidental character of the discovery its subsequent investigation was impossible. Gradually this discovery from “possible BF source” ... and “flint outcrop with traces of Neolithic exploitation” (Biagi, Starnini 2010b, 124, 131) evolved to BF “sources and workshops along the Danube” (Biagi, Starnini 2011, 69). As a first comment on this ‘sensational discovery’, it should be stressed that the region has been prospected and studied by geologists and archaeologists for decades, and the flint outcrops along the Danube are well known and could be reputedly ‘revisited’, by everyone, but no one should be allowed to take finds from their background and publish them just as a result of spontaneous (tourist/study?) trip in a foreign country with quite well structured laws and regulations about every kind of archaeological practice¹⁵. The second comment is that there is no evidence that the assemblage belongs to the Early Neolithic. The very few cores known from early Neolithic strata (Slatina, Ohoden, Karanovo) differ from those presented by Biagi and Starnini in their articles (see Гацов 1992, 100; Zlateva-Uzunova 2009). On the other hand quite similar finds to the cores, blanks and tools presented by Biagi and Starnini are known from a late Holocene sequence in the region and part of them (completely identical) are published by S. Sirakova as a result of trench investigations on the sites of Osam and Zhabeshki kamak (in vicinity of the village Musselievo, south-west of Nikopol). The materials are interpreted as remains of flint workshops in use during the Bronze and Iron Ages. Several local raw material deposits along Danube and a little way to the south are also presented in the book (Сиракова 2006, 9). The most common flint from the Holocene Osama site is described by S. Sirakova as BG-MO-F7 (beige not homogenous, not translucent, with dark brownish inclusions and small whitish spots) and comprising 90% of the whole assemblage (Сиракова 2006, 14, 38). This flint appears identical to some of the examples shown by Biagi and Starnini (Biagi, Starnini 2010a, figs. 5-6; 2010b, fig. 7; 2011, figs. 6-7). If Biagi and Starnini knew the publications concerning the region, they would probably interpret the find as belonging to the Bronze Age, as suggested by the similarity with Harrapan workshops in Pakistan, mentioned by themselves (Biagi, Starnini 2011, 75). It should be stressed also that in this region (less than 10 km from Nikopol) is situated the famous Middle–Upper Palaeolithic site of Musselievo, with an amazing assemblage of leaf points, which was studied and published decades ago (Haesaerts & Sirakova 1979). The flint from the Musselievo settlement has a local origin and has visually a pronouncedly more beige-greyish appearance than commonly described BF (fig. 10.1). There is no doubt that in this region rich in accessible and different raw materials a flint knapping know-how had emerged and underwent different technological transformations/evolution since the Palaeolithic. Unfortunately we have a gap (i.e. no archaeological records) in the chronological sequence between the end of the Epipalaeolithic and the beginning the Early Neolithic, and *ergo* – no evidence of any activity by the eventual indigenous pre-Neolithic substratum. It will certainly be very important and welcome if one

15 An administrative precision is indispensable here: according to Bulgarian law every kind of archaeological prospecting/or excavation must be approved and permitted by the Ministry of Culture. All legal archaeological field activities (including surveys) carried out by foreigners are co-ordinated by Bulgarian professionalists in archaeology. There is no official option like a ‘study trip’ that could result in a publication without Bulgarian collaborators.

may confirm that Biagi and Starnini's unstratified discovery could be related to a first Early Neolithic workshop of BF, but no serious arguments are yet forthcoming.

The BF problem definitely deserves serious systematic and relevant research and it is slowly and continuously being done. The alteration of spontaneous illegal approaches will certainly not contribute properly to a professional and appropriate scientific solution.

- Without doubt one of the most crucial aspects in our search for the BF provenance, supply patterns and distribution, is the identification of the prehistoric workshops. Apart from the workshops mentioned above, which could not be taken into consideration for our research, only one of the sites with formal toolkits made of BF possesses a workshop area – Slatina, in Sofia. Because of the strong fire that destroyed the 'big house' with the workshop, there is no chance of any reconstruction of the manufacturing process and raw materials used. On the basis of the archaeological evidence it could be assumed that to all of the sites with BF and formal tools, the artefacts were delivered as blanks (blades) or finished tools. Another explanation could be that only the parts of the site that are devoid of remnants related to the initial knapping process have been systematically excavated. Another site where a workshop has been identified is Ohoden, near Vratsa (fig. 3). The site is interpreted as 'monochrome' (i.e. earliest) Neolithic on the basis of comparative pottery study with sites of the Starčevo culture in eastern Serbia and south-western Romania, and has a date of 5710 ± 40 cal BC (with details KN-5655, 6830 ± 45 BP) (Ганецовски 2007; 2009, 10-11). This date incidentally does not fit with the claim of 'monochrome' affiliation in its chronological and cultural position, and for now excludes the site from the potential first promoters of the BF to the Early Neolithic life-style. My personal impressions about the flint industry of Ohoden site are quite fragmentary; during a short visit there some BF tools were examined (fig. 2, 11), but the recent publication of the site does not give clear evidence of the presence or absence of a formal toolkit. Among the flint types described, there are two types corresponding to BF and presumably coming from Razgrad region. Only blades and tools are made of those flints and there is no relationship to be made with the numerous cores from the workshops and building 1 of the site (Zlateva-Uzuniva 2009). My last visit to the site and discussion with colleagues Ganetsovski and Zlateva-Uzunova was very fruitful and confirmed the significant proportion of BF artefacts among the flint assemblages from Ohoden. Several samples were taken for the further analysis in the frame of the ARCS project.

More promising in this perspective seems to be the Dzhuljunitsa Early Neolithic site (Veliko Tarnovo district) where no common formal toolkits are attested, but the Early Neolithic monochrome pottery coexists with BF artefacts from the very beginning of the sequence. My study of the Dzhuljunitsa flint assemblages is in progress and as a working hypothesis I argue that this site with the earliest Neolithic occupation until now ($6300-6110$ cal BC)¹⁶ was the first centre for BF acquisition, blade manufacturing and consumption and distribution of BF under different forms of nodules and/or blanks. BF is attested in significant proportions among all debitage groups and even prevails among the blades. Blade production shows advanced knowledge of debitage (and particularly punch) techniques. The same conclusion on the basis of a study of the old excavation material from Dzhuljunitsa (and another site, Katchitsa) was offered by Ts. Tsonev, who considered these sites in north-central Bulgaria as 'transient' points between the north-eastern (Ludogorie) production centre of high quality flint with the tell sites in Thrace being main consumers of long blades (ЦОНЕВ 2009, 40).

16 Elenski, personal communication on still unpublished dates

'Balkan Flint' trajectory and Balkan Neolithization

The foregoing discussion includes aspects of the background to the BF problem and the questions derived there from. The followed section represents the thoughts of the author on the contextual and conceptual meaning of BF in the context of the Balkan Neolithization debate.

In the present state of knowledge on the emergence and spread of the Neolithic in present-day Bulgaria, the Strimon river route from northern Greece can be considered indisputable. Let us remind ourselves that the earliest date (so far) from Kovačevo falls in the range 6159-5926 cal BC (Lichardus-Itten et al. 2006, 85). In the earliest period (phases I a, b) Kovačevo was part of a very early regional facies that extended from Greek western Macedonia in the south (Nea Nikomedeia, Giannitsa) to the Ovče Polje in the north (Anzabegovo, Vršnik). According to the Kovačevo research team the region of the Strimon and Vardar valleys was probably directly and independently colonized with a continuously maintained direct connection with an Anatolian (Asia Minor) homeland (Lichardus-Itten et al. 2002; 2006). It is noteworthy that the formal toolkit made of BF appears around level Ic–Id of the Kovačevo sequence, i.e. – later. In this respect, if as seems likely the Strimon was one of the first and direct routes of Neolithic diffusion into the Balkans, then that part of the classical Early Neolithic 'package' consisting of typical Karanovo I pottery and formal flint toolkits cannot be linked with this first stage of demic and cultural diffusion. In the BF perspective Kovačevo plays a later role when the site was affiliated with inter-regional exchange and secondary Neolithic movement taking place during the establishment and expansion of the Karanovo I culture.

The nature of diachronic and cultural relations between the Karanovo I culture and the early Neolithic settlers in northern Bulgaria is more complicated.

According to another scenario the first wave of Neolithization in Bulgaria can be traced via the Strimon, Vardar and Morava old rivers to the north, followed by a 'west to east' movement along the Danube river to north-central and north-eastern Bulgaria. A later (c. 6200 cal BC) movement of the Neolithic enclaves (already at the stage of white painted pottery) to the south led to the Neolithization of the Thracian plain and the establishment of the Karanovo I culture (Тодорова, Вайсов 1993, 61-62). As seen above, the rather late date from Ohoden, does not fit this Danube downstream movement, but does not exclude it either. In this scenario, of crucial importance is the evidence relating to the first evidence of a Neolithic identity in the Iron Gates region. The beginning of farming in the region is assigned to c. 6000 cal BC as the period 6300-6000 cal BC in the Iron Gates (including the Romanian side) is interpreted as a period of temporary abandonment of some of the sites due to the consequences of the '8.2 ka cold event' (Bonsall 2007). According to another opinion the first stage of Neolithization took place in the region between 6300/6200 and 5900 cal BC (Borić 2007; 2008). In this context it is very important to make precise the time of the first emergence of artefacts of BF among the Iron Gates sites. Such an exact chronological position could be viewed as a discriminatory factor for the beginning and direction of BF exchange. If this flint starts to be used before 6000 cal BC then a local (eastern Serbian/south-western Romanian) provenance can be presumed. Another possibility is to presume the supply and transportation of the BF from the Moesian platform sources in Bulgaria and several scenarios are plausible: -(i) organized expeditions for raw material procurement, which could reach Moesian sources in the Pleven-Nikopol region c. 300 km away; -(ii) an exchange network where the site of Dzhuljunitsa could be seen as a centre for procure-

ment and distribution of BF coming both from the Moesian and Ludogorie areas; -(iii) an exchange network in which the actors from the Bulgarian side are still undiscovered early Neolithic enclaves from the northern, or north-eastern part of the country.

Another scenario of the origin and spread of the monochrome Neolithic is that put forward by M. Özdoğan, utilising evidence from pottery analysis of the Koprivets culture. Özdoğan (1997; 1999; 2005) suggested an interaction zone between north-central Bulgaria, northwest Anatolia and Turkish Thrace, which is gaining adherents and serves to promote the theory of the penetration of Neolithic elements from north-west Anatolia northward via the Maritsa river valley... "then along the valleys of the Tundzha and the Sazlijka Rivers, and through passes in the Stara Planina into northern Bulgaria (the basin of the Yantra River)" (Boyadziev 2006, 9).

A third variant was introduced by Özdoğan himself as an expansion from the Bosphorus area northward along the Black Sea coast and penetrating into the Ludogorie region as far as the Danube, then turning west up the river "...thus bypassing the inner part of Bulgaria" (Özdoğan 2006, 27).

In both scenarios of demic diffusion from north-west Anatolia (Marmara region) the site of Dzhuljunitsa is at the epicentre of the process, being closely affiliated to the context of Anatolian influences (mainly in pottery style) (Еленски 2008; Elenski 2004). This site is also the most serious candidate for the 'nuclear area' of procurement and subsequent distribution of BF 'Balkan Flint' and blade production. The location of the site at an almost equal distance from the Pleven-Nikopol Moesian flint and Ludogorie deposits (between 60 and 100 km) is quite advantageous for acquisition and transportation of raw material. We have to keep in mind that expeditions over much greater distances are presumed for acquiring high quality raw material in Neolithic times – about 400-500 km (Binder, Perlès 1990, 260).

According to the available archaeological evidence, among the Dzuljunitsa flint repertoire there are virtually no formal tools of BF in spite of the fact that there are many blanks for their manufacture. The site's inhabitants were probably only producers and consumers of blades of BF. On the other hand, once they knew the advantages of the Ludogorie BF (my assumption), they could take advantage of this acquisition and reach a local and independent perfection of their technological skills. Becoming thus the 'new flint knappers' they might incorporate BF products into the network of intra- and inter-regional exchange of goods, exotica and social messages. Being probably not particularly interested in formal toolkit utilisation, the flint workers from Dzuljunitsa could have decided at a later stage to dedicate their efforts to the acquisition and circulation of the raw material and/or blades, becoming autonomous from the immediate consumers of the flint tool production. The real producers of the formal tools could be the enclaves of the (pre-) Karanovo I culture in Thrace with whom the central-north Bulgarian population established contact after reaching the stage of white-painted pottery (as assumed by Todorova and Vaisov – see above). The problem is that neither in north-central and north-eastern Bulgaria, nor in the vicinity of the Thracian tell settlements have any remnants of BF 'Balkan Flint' workshops been discovered.

To summarize the discussion about the BF issues of the stages/succession of Balkan Neolithization: the scenario of the Balkan-Anatolian full Neolithic package emerging via the Strimon river (represented by the early facies at Kovačevo) does not explain the appearance of the BF and macro-laminar toolkits as diagnostic features of the Karanovo I cultural complex. The provenance of BF from one or more outcrops in northern Bulgaria is an additional reason for discarding the Strimon river valley as a route of the spread of the Karanovo I culture in Thrace.

More satisfactory solution (from raw material perspective) might be found by exploring the concept of a 'monochrome' substratum in northern Bulgaria, but even reaching the stage of white-painted pottery there is no evidence that the people achieved the manufacture of the formal BF toolkits, which are an attribute specific to the Karanovo I culture. Quite admissible seems to be a concept of a local development and interaction between these (at least two already attested) pre-Karanovo substrata, in which people from central-north Bulgaria participated with an elaborate BF manufacture know-how. This idea fits well with the concept of a local emergence of white-on-red painted pottery in the Balkans with a subsequent wide scale distribution "...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).

Probably, the proper incorporation of the BF problem in the broader context of the Neolithization debate would contribute additional insights into the various contradictory concepts. Here, we should recall that J.K. Kozłowski (2007) advocated (i) a marginal role for the Marmara Sea region in the primary Neolithization of the Balkans, and (ii) later influence of the complexes with white-painted pottery (together with elements of macroblade technology) from the west into Turkish Thrace and Marmara basin. On the other hand, the recent discoveries at Aşağı Pinar led M. Özdoğan to argue for the need for revision of the conventional view and hypotheses that neglect north-western Anatolia as a bridge for the first Neolithic impact into the Balkans (Özdoğan 2006; 2008).

In place of a conclusion: Why is BF so important ... to the extent that we have devoted a conference session and so much subsequent attention to it? It is certainly not (only) because of its aesthetic features – beautiful and nice to touch... Its stylistic appearance surely played significant role in its broader distribution and appreciation, but this aspect of the biographical reading of BF is still underestimated or at least not sufficiently emphasized in the specialized literature (apart from some general observation by J. Chapman on the value and meaning of colour, brilliance, and 'domestication' of the exotic in the Early farming communities of south-eastern Europe (Chapman 2007). It is noteworthy however that such a 'biographical approach to flint *per se* led A. Van Gijn to conclude about one artefact (a dagger of Grand-Pressigny flint) that "the aesthetical qualities of the flint, notably the pretty honey-colour, must also have contributed to the attractiveness" (Van Gijn 2010, 186). This attractiveness is charged with social and ideological meaning which take part of the 'ritualisation' of flints alongside its life-history (see Van Gijn 2010).

In the Balkan context of understanding and revealing flints' role and involvement into the life-style of prehistoric humans, the main reason for our focus on the BF is that under different forms – nodules, blanks, tools and embodied in them social messages – the BF represents an integral part of the Neolithization process in the Balkans. Until now its role within the Neolithization debate has not been fully appreciated and recognized. However it is clear (and already demonstrated for Bulgaria) that BF must be taken into consideration when revisiting previous conventional and comfortable conceptualisations and for improving any further scenario of the direction and spread of the Neolithic into Balkans and Central Europe (Гюрова 2009; Gurova 2008; 2011; forthcoming). Even present day Bulgaria by itself appears to be a quite sophisticated puzzle and mosaic of the emergence of successive Neolithic features, in which BF contradicts certain paradigms and provokes new challenging questions waiting satisfactory solutions. One of the most challenging questions requiring serious re-consideration of the conventional statements can be formulated as **who were**

the new flint knappers and **from where** did they come bringing the know-how of quite large Early Neolithic BF blade production? If they came as migrants from Anatolia, from the south, along the river valleys of the Struma, Mesta and Vardar (as traditional explanations suggest) they would have brought with them the BF toolkits. However, this presumption is not supported by the archaeological evidence from northern Greek, Macedonian, and southern Bulgarian sites (as shown by the Kovačevo case-study). On the other hand if they reached and inhabited northern Bulgaria first and then spread across the rest of this territory at least the problem of acquisition of the raw material (BF) could be theoretically resolved... but there is still no convincing archaeological evidence of pre-Karanovo settlements and flint (BF) workshops in the area north of the Stara Planina (Balkan Mountain) chain..., except Dzhuljunitsa... if new ¹⁴C dates confirm its pre-6000 cal BC dating.

Acknowledgements

I should like to thank a number of people for our fruitful collaborations: the geologists Ch. Nachev, Y. Stefanov and D. Ivanova; those colleagues who have given me access to archaeological samples from Bulgaria – V. Nikolov, M. Kulova, N. Elenski, G. Ganetsovski, K. Leshtakov, V. Matsanova, S. Ignatova; E. Anastassova and B. Mateva – for enlarging the referential raw material sampling. Particular thanks to colleagues offering me the opportunity to see/study flint assemblages from neighbouring countries: D. Borić for the challenging study of a collection from the site of Aria Babi (Serbia) and his permission to illustrate BF artefacts in my paper before complete publication of the finds; R. Dobresku – for our observation and stimulating discussion on the assemblage from the site of Ciuperceni (south Romania); C. Bonsall and A. Boronanț – for a brief pilot study on flint assemblage from Schela Cladovei – excavation 1992-95. My gratitude to C. Bonsall, B. Voytek and D. Borić for their co-operation and help in initiating and organizing the 'Balkan Flint' scientific session at the 15th EAA Meeting in Riva del Garda (Italy) in 2009, and for their critical reading of my paper.

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‘Балканският флинт’ – фикция и/или траектория към неолитизацията: данни от България

Мария Гурова

Резюме

Статията е фокусирана върху специфичен проблем, отнасящ се до раннеолитните кремъчни индустрии на Балканите. Този проблем гравитира около т.нар. ‘Балкански флинт’ (за краткост БФ) като тип кремъчна суровина, но придобива изключително съдържание и важност в контекста на неолитизацията в посочения регион.

По „дефиниция“ ‘Балканският флинт’ {‘Balkan (Pre-Platform) flint’ – на английски и ‘silex balkanique/blond’ – на френски} е висококачествен кремък с жълтеникаво-меден-восъчен цвят и с бели впръсквания и петна. Навлизането му с специализираната литература е съпроводено с погрешната и безкритично повтаряна презумпция, че произходът му е в Предбалканската платформа в Северна България. Произволната употреба на термина не е базирана на сериозни геологически проучвания и води до несъзнателни спекулации, преекспониране и своеобразна ‘митологизация’ на този вид флинт. Необходимостта от адекватен подход към БФ, като съществено явление в праисторията на Балканите, доведе до организирането (инициирано от автора) на научна сесия в рамките на 15 конференция на ЕАА в Рива дел Гарда: “Balkan Flint” in SE European Prehistory: Chronological, Cultural and Social Perspectives”.

Статията въвежда в проблематиката, акцентирайки върху географското и културно-хронологическо разпространение на БФ в контекста на раннеолитната ойкумена на Балканите; проследява в историографски аспект развитието на проучванията върху кремъчните суровини в перспективата на праисторическата им употреба в България; коментира теориите за произхода на БФ и реалното състояние на проблема; представя последните резултати от анализа на археологически и геологически образци от България и някои съседни държави. Тези анализи, проведени с помощта на дюншлифи и LA-ICP-MS (мас-спектрометрия в индуктивно свързана плазма), са плод на съвместните усилия на автора с екип от геолози и археолози и целят да идентифицират произхода на артефактите от БФ с оглед да бъдат реконструирани стратегиите за снабдяване и дистрибуция на суровината сред праисторическите общности на Балканите.

Съществено внимание е отделено на проблема за диагностичния кремъчен ин-

струментариум (т. нар formal toolkit), който е неотменен атрибут на раннеолитната култура Караново I. Темата е въведена и многократно дискутирана от автора в контекста на неолитизацията и с акцент на 'кремъчния фактор' като коректив в репертоара от тези, теории и парадигми на неолитизационния дебат.

В заключение е изтъкната възможността и необходимостта от многопластов семантичен подход към артефактите от БФ, носители на утилитарно, символично и гносеологично съдържание. Още повече, че специализираната литература дава отлични примери на подобен подход, който разкрива пълноценния живот и богата биография на кремъчните изделия.