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THE ORIGIN OF THE TROUGH RETOUCH IN THE LUBLIN-VOLHYNIAN CULTURE

ABSTRACT

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The technique of trough retouch played a key role in the Lublin-Volhynia culture as the most expressive technology of co-shaping the edges of flint tools. An important role is played by the so-called retouched blade-daggers, produced using this retouching technique. They were part of the equipment for the graves of men considered to be members of the local elite. They appeared in a similar context only in the early Eneolithic Skelya culture in the Black Sea steppes and are dated from at least 4500 to 4100 BC. Specimens from the steppes must have been a source and act as a model for imitation in the production of analogous artefacts in the latter culture. The lack of retouched blade-daggers in Trypillia and Malice culture proves that the Lublin-Volhynia culture population took them directly from the Skelya culture. This adaptation took place no later than 4100 BC, when the Lublin-Volhynia culture population already had their own elite, ready to use retouched blade-daggers.

Keywords: trough retouch, Lublin-Volhynia culture, retouched blade-daggers, Black Sea steppes, Skelya culture

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INTRODUCTION

Trough-like retouch is a distinctive method of forming flint tools with flat and semi-flat retouching with long parallel negatives, perpendicular, and most often oblique to the longitudinal axis of the product. It was used to form blade and bifacial tools.

So far, Anna Zakościelna and Jerzy Libera have devoted the most attention to this retouching in Poland (Libera and Zakościelna 2013; Zakościelna and Libera 2014). They defined the classic type of trough retouch. It is flat or semi-flat, very regular, with negatives and micro-negatives situated parallel to each other and perpendicular or oblique to the retouched edge. It covers considerable parts near the edge, sometimes the entire edge, or less frequently the whole surfaces of the tools. It occurs mainly in the Lublin-Volhynian culture (hereafter: L-VC). It is found sporadically in other Eneolithic cultures as evidence of ties with this culture. In later periods, there was no trough retouch of the classic variety (Libera and Zakościelna 2013, 228).

Similar retouching techniques were already present in the Upper Palaeolithic (Solutrean culture and Aurignacian industries) and in the pre-ceramic Neolithic period in Hacilar and Çatal Hüyük in Anatolia. In Europe, the earliest in the Eneolithic context it was found in the Kodjadermen-Gumelnița-Karanovo VI (hereafter: KGK VI) cultural complex. Occasionally, it was used there to shape bifacial points (Libera and Zakościelna 2013, 218). In the non-classical version, this retouching was used in various cultures of the late Neolithic and early Bronze Age in Scandinavia and in Central and Eastern Europe (Zakościelna and Libera 2014).

It was only in the Cucuteni-Trypillia cultural complex (hereafter: CTCC) that the trough retouching (in its classic version) played an important role, but not as much as in the L-VC. It appeared on the Dniester (Polivaniv Yar, Zalishchiki) in the BI phase of the Trypillia culture (hereafter: TC). In the entire area of the culture in question, the trough retouching became widespread in phase BII (Libera and Zakościelna 2013, 218).

The aim of the article is to explain the genesis and chronology of the appearance of the trough retouch in the L-VC.

THE SPATIAL AND CHRONOLOGICAL RANGE OF THE STUDY

The chronological and spatial scope of the article is determined by the occurrence of mass (non-sporadic) production of flint tools (such as: retouched blades, blade tools, bifacial points), shaped by classic trough retouching.

These tools are recorded at the earliest in the area of the steppe, in the early Eneolithic Skelya culture (hereafter: SC), located between the Dnieper and Siverskyi Donets and the lower Don (Rassamakin 2020, fig. 1), in Suvorovo communities from the same time in the

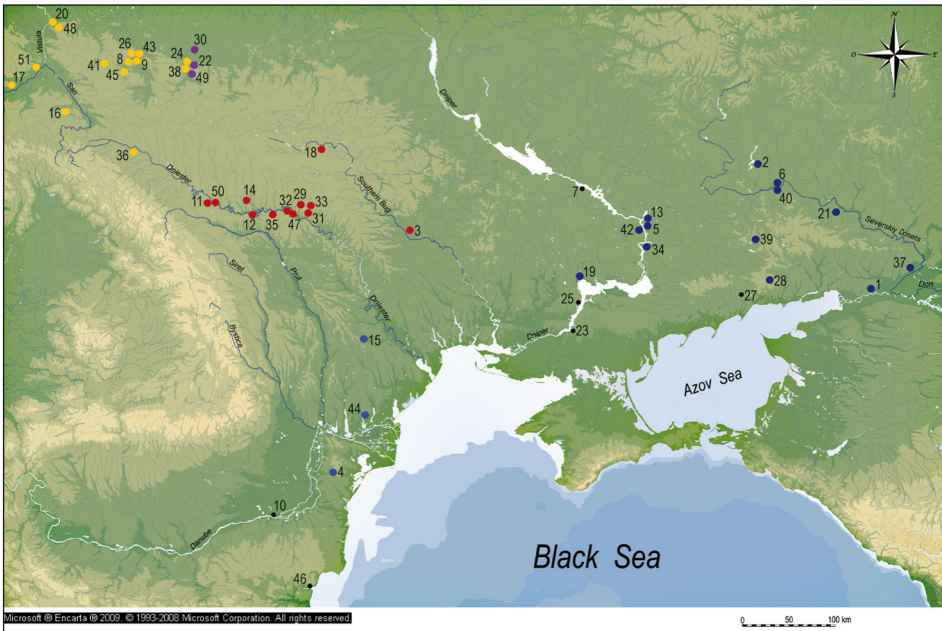


Fig. 1. Map of the most important sites mentioned in the text: 1 – Aksay; 2 – Aleksandriya; 3 – Berezo-vskaya (Hydroelectric Station); 4 – Casimcea; 5 – Chapli; 6 – Chernikovo Ozero; 7 – Dereivka; 8 – Goz-dów; 9 – Gródek; 10 – Gumelnița; 11 – Horodnytsa-Horodyshche; 12 – Hrynychuky; 13 – Igren; 14 – Ka-diyvtsi; 15 – Kainar; 16 – Kosina; 17 – Książnice; 18 – Kurylivka; 19 – Kut; 20 – Las Stocki; 21 – Luhansk; 22 – Lyshche; 23 – Lysogorskoe; 24 – Luck; 25 – Mikhailovka; 26 – Moniatycze Kolonia; 27 – Nikolskoe; 28 – Novodanilovka; 29 – Nyzhniy Olchedaev; 30 – Ostriv; 31 – Ozaryntsi; 32 – Ozheve-Ostriv; 33 – Pa-tryntsi; 34 – Petro Svistunovo; 35 – Polivaniv Yar; 36 – Radelichi; 37 – Razdorskoe; 38 – Rovancy; 39 – Se-menovka; 40 – Serebryanska; 41 – Sitaniec Vvolica; 42 – Strilcha Skelya; 43 – Strzyżów; 44 – Suvorovo; 45 – Tyszowce; 46 – Varna; 47 – Vasylivka; 48 – Wąwolnica; 49 – Yaroslavichi; 50 – Zalishchiki; 51 – Złota; yellow circles – L-VC; violet circles – Rzeszów phase of the MC; red circles – TC; blue circles – Suvorovo type; dark blue circles – SC; small black circles – sites of other cultures
(prepared by Elena Starkova and Maria Juran)

lower Danube area and in the Khvalynsk culture (hereafter: KC) from the lower Volga (Rassamakin 1999, 63, fig. 3.1).

They are dated to the early steppe Eneolithic period 4550 (?) – 4100/4000 BC (Rassamakin 1999, 97, tab. 3.2) or in a slightly newer approach to the period 4750 (?) – 4100 (?) BC (Rassamakin 2004a, 180-182, fig. 125).

Numerous examples of the use of the classic trough retouch in the CTCC in the stages: Cucuteni A and AB2 and Trypillia BI and BII extend the spatial scope of the article by forest and forest-steppe parts of the Boh, Dniester, Prut, Seret and Dnieper river basins in the vicinity of Kyiv (Chernysh 1982, 194-212, map 5). As the above-mentioned phases are dated from about 4550-4100 (BI) to 4100-3800 (BII) BC (Rassamakin 2004a, 180-183, fig. 125), the time span of this article extends by another 300 years to 3800 BC.

The most complete trough retouching in its classic form was used in the L-VC (Zakościelna 1996, 92, 93; tab. I-LV). It occurs from the upper Horyń river to the Wieprz river valley, occurring in the Volhynia Upland, further west on the Nałęczów Plateau, in the Małopolska Upland and in the Rzeszów loess belt, and is significantly diluted in the upper Dniester basin (Zakościelna 1996, 19-26, map 1). In the Małopolska Upland, this culture is dated to the period 4050-3800 BC (Wilk 2018, 486). Due to the relationship with the cultures of eastern and south-eastern Europe, the beginning of this culture in the Volhynia Upland should be moved to 4250 BC.

The spatial scope of the article therefore covers vast areas north and east of the Carpathians, to the northern boundaries of the Małopolska, Lublin and Volhynia Uplands. In the north-east it reaches Kyiv, in the east the lower Don. In the south, the border is the shores of the Azov and Black Seas, as far as the Danube Delta and Dobrogea. Particular attention is focused on the area of Volhynia, the upper Dniester and Siverskyi Donets basins (Fig. 1). The chronological scope is narrowed down to the second half of the 5th millennium BC and the beginnings of the 4th millennium BC.

MATERIALS

Skelya culture

There are rich deposits of high-quality Upper Cretaceous flint raw materials between the Dnieper and Don rivers, where the SC people lived. They occur in concretions of various sizes (from 10 to several dozen cm) and shape (bulky, shallow; *cf.* Kolesnik 2017; 2019). They are relatively easily accessible in the exposures of eroded hills and river valleys, especially in the Bakhmut-Toretsk river basin, the middle Siverskyi Donets, in the Krynka river valley, in some parts of the Miyus and Tuzlov valleys, at the mouth of the Donets and Don and in the middle course of the Oskol River (Fig. 2; Kolesnik 2019, 599-601). There was a “Donetsk flint mining centre” in this area. Anatoliy V. Kolesnik (2019, fig. 1, 604-614) lists six mining and processing regions, the largest of which – with underground mining chambers – was identified in the village of Shirokoe. In all these outcrops, remains of flint mines (pits) and flint processing workshops dating from the Palaeolithic to the Bronze Age have been discovered. On the other hand, the mining of Cretaceous flints in the Donbas area began in Eneolithic, along with the demand for macrolithic blades (Kolesnik 2017, 60; 2019, 610).

In the available literature, details on the macroscopic characteristics of these raw materials are modest. Dorothea S. Tsveybel (1970, 229), publishing the results of research on mining installations in the vicinity of the village of Shirokoe, describes the flint there as grey, smoky, and matt without specifying the size of concretions. Kolesnik (2019, 605) in the Krasnoe mining complex (on one of the right tributaries of the Donets) distinguishes

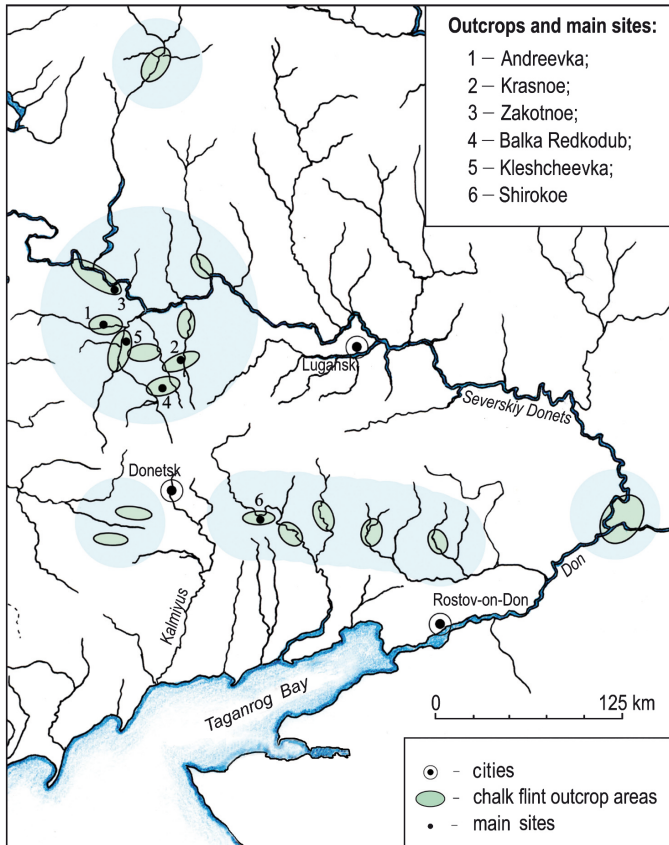


Fig. 2. Map of the Cretaceous flint deposits in Donbas and mining sites (after Kolesnik 2019; prepared by Elena Starkova)

between two types of flints: grey and dark grey glassy and “variegated” with white and brown veins. The latter occurs in the form of large concretions. Glassy grey flint was also located in the Stupka river and in the Dolgaya valley (Kolesnik 2019, 605, 606).

Thus, the SC communities had the comfort of functioning in an environment rich in good flint raw materials. The flint making of this culture is known primarily from burial sites, the few settlements, and hoards of cores and blades. At least a dozen of them are located along the main rivers, *i.e.* the Severskiy Donets and its tributaries, the Don and the Dnieper (Telegin *et al.* 2001, 62; Kolesnik 2012).

Numerous macrolithic blades and retouched blade-daggers as well as triangular points of various sizes shaped with flat retouching come from the graves of the SC. Judging by the drawings, and especially the photos available in some publications (Skakun 2008; Rassamakin 2020), at least some of them are developed with the classic trough retouch, very

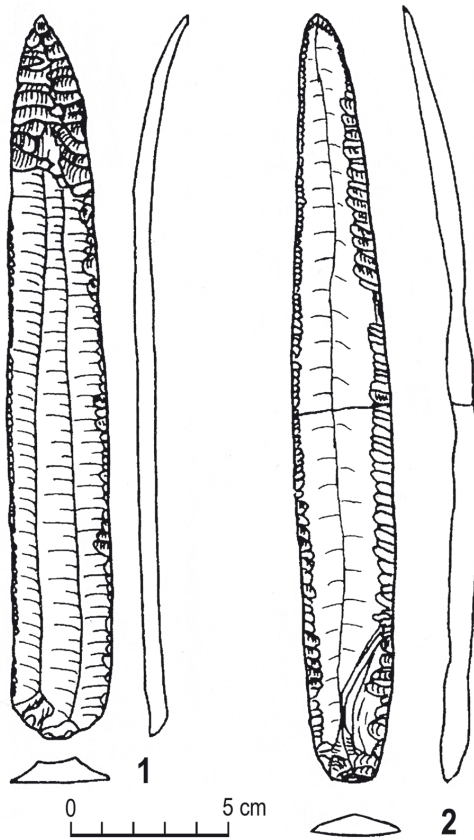


Fig. 3. Skelya culture: 1 – Aksay, group of mounds „Mukhin II”, mound 5, grave 9 (obsidian); 2 – Kut, mound 8, grave 7 (flint) (after Rassamakin 2004a; 2004b)

regular. In a few cases, this semi-flat retouch extends far onto the surface of the products and, in contact with the negatives on the other side, completely covers the negative blade surfaces.

The most spectacular examples of long blades, retouched blade-daggers and, at the same time, the most numerous sets of bifacial triangular points, were provided by the complexes of burial group II (dated 4550-4100 BC) from Alexandria (Rassamakin 2004b, Pl. 194, 195; 2020, fig. 10: 2), Igren VIII (tomb 8 – Rassamakin 2020, fig. 15: 4; tomb 10 – Rassamakin 2020, fig. 9: 2 and Rassamakin 2004b, 76, Pl. 252-254, 257), Kut (tomb 8, tomb 7 – Fig. 3: 2; Rassamakin 1999, fig. 3.8: 7; 2004b, Pl. 232: 3, 5), Luhansk (Skakun 2008) and Petro Svistunovo (Bodianskyi 1968; Skakun 2008). Interestingly, one of the longest retouched blade-daggers, from the grave at Aksay “Mukhin II” on the Don, is made of obsidian (Fig. 3: 1; Rassamakin 2004b, Pl. 291: 10).

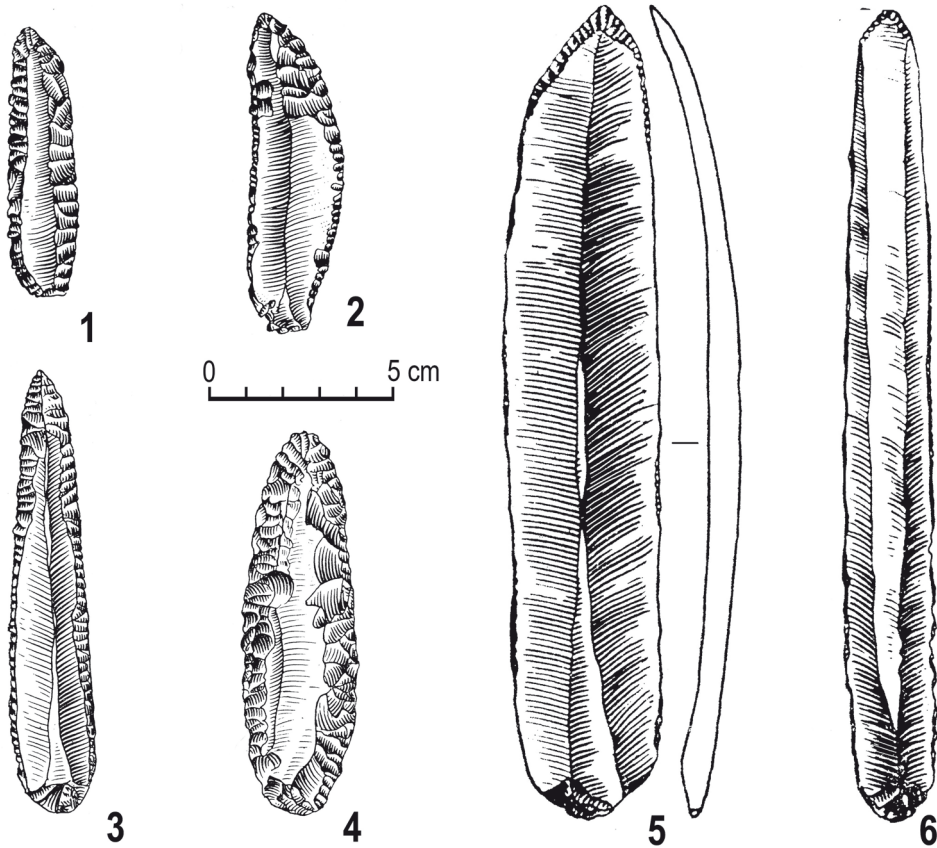


Fig. 4. Skelya culture: 1-5 – Petro Svistunovo (after Bodianskyi 1968)

Some of the graves of burial group II contained numerous flint products. First of all, one should pay attention to two such objects. Sixty years ago, two partially destroyed graves were discovered in Petro Svistunovo in Zaporizhia (Bodianskyi 1968). Exceptional flint equipment was contained in grave 2. Its inventory contained 60 bifacial points of various sizes (Bodianskyi 1968, fig. 4; Rassamakin 2004b, Pl. 235-241), eight axes with a lenticular cross-section (Bodianskyi 1968, fig. 1; 5; Rassamakin 2004b, Pl. 242), 15 blades preserved wholly and in fragments. They include regular blades 16 to 27 cm long (Bodianskyi 1968, fig. 7: 2-4; Rassamakin 2004b, 74-76, Pl. 243: 6-8; 244: 1) and three retouched blade-daggers (Bodianskyi 1968, figs 2: 3, 5; 7: 1; Skakun 2008, figs 9, 10). The latter, as well as all the bifacial points, are formed by regular trough retouching (Fig. 4). Moreover, from the surface of the site and from the destroyed graves, copper bracelets, beads and a copper battle-axe, boar tusk and *Cardium* shell pendants were collected (Bodianskyi 1968, fig. 3; Rassamakin 2004b, Pl. 233, 234).

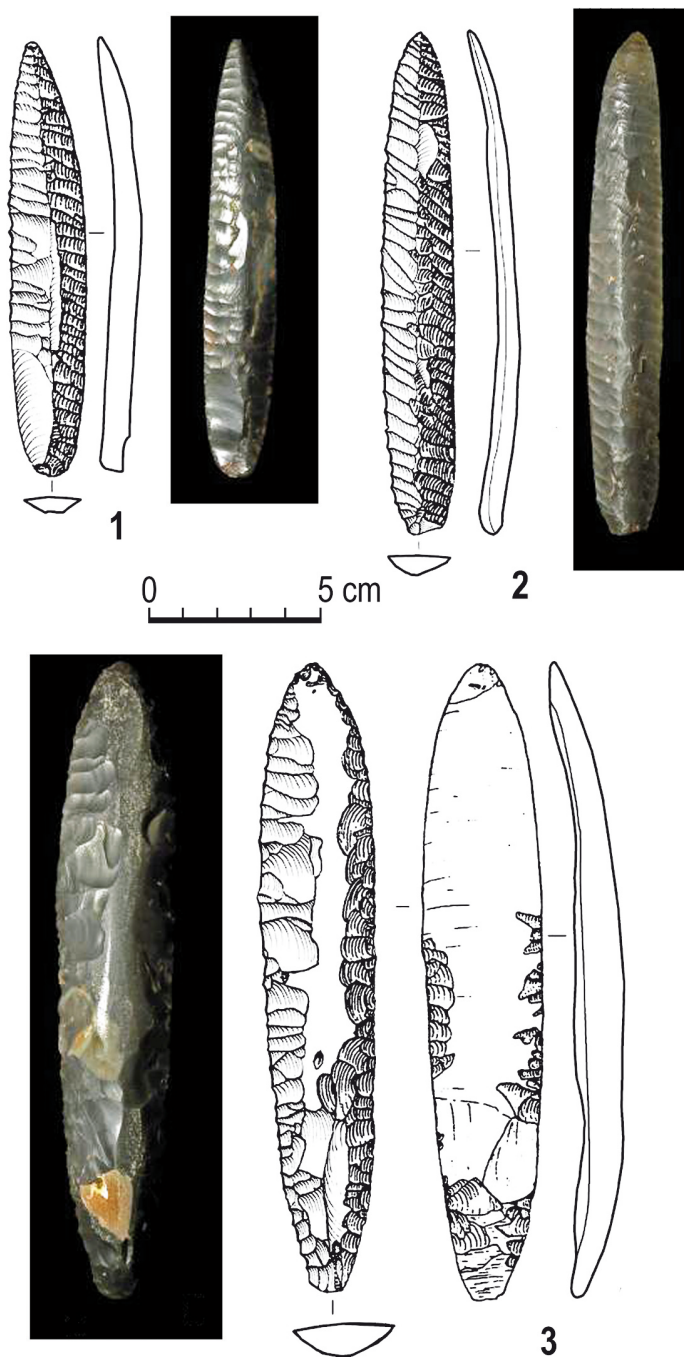


Fig. 5. Skelya culture: Luhansk (after Skakun 2008)

A triple grave explored in 1970 in Luhansk (former Voroshilovgrad) contained a unique set of flint products. The dead were equipped with 33 items made of flint, slate, serpentine, bone and horn (Pislariy *et al.* 1976, 21-25). The flint inventory consisted of 17 macrolithic blades and their fragments. Most of them were located by the skull (8 on the right side – Pislariy *et al.* 1976, figs. 2; 3: 7, 8, 10-15 and 2 on the left side – fig. 4: 1, 2) and around the hips of the skeleton 2, the middle one. In addition, this individual (in the middle) had one long blade in each hand, including one with proximal and distal retouching (Pislariy *et al.* 1976, 22; fig. 4: 6, 7). The individual labelled skeleton 1, was equipped with a single-sided blade with a trough retouch and a retouched blade placed under the skull (Pislariy *et al.* 1976, fig. 3: 1, 3; Skakun 2008, fig. 4: 2; 5: 3), and a dagger formed with the same retouching (Pislariy *et al.* 1976, fig. 3: 3; Skakun 2008, fig. 5: 5; 7: 3), while skeleton 3 had one blade with a retouched tip in his right hand (Skakun 2008, fig. 3: 5).

In 2008, Natalia Skakun published the results of the technological and traseological analysis of 14 flint products from a grave in Luhansk. They are made of three raw materials that differ in colour: honey yellow (Skakun 2008, fig. 4 and: 1, 2, 5, 7-10), striped grey (Skakun 2008, fig 5: 1-3; 6: 3, 4, 6) and black (Skakun 2008, fig. 5: 5-7; f: 2-4). The author of the study does not decide on the origin of the raw materials, although she mentions that they may come from deposits in the Don basin (*cf.* Pislariy *et al.* 1976, 26). Nevertheless, she notes that yellow flint is very similar to the raw materials from Dobrogea known to her from personal inspection, while black – to Volhynian flint. The blades made of honey yellow flint are 15-23 cm long, 2-3.8 cm wide and 0.4-0.6 cm thick. The two entire blades of striped grey flint measure 19 and 19.2 cm in length, 2.3 cm wide and 0.4 cm thick. On the other hand, retouched blade-daggers made of black flint are 12.5-18 cm long; 2-3.5 cm wide and 0.8-1.3 cm thick. Three retouched blade-daggers of black flint were made with a trough retouch (Skakun 2008, figs. 5: 5-7 and 7: 2-4). In two cases, the negatives are oblique to the axis of symmetry, very regular contact with each other and cover the entire dorsal surface of the blades (Fig. 5: 1, 2; Skakun 2008, fig. 5: 5, 6 and 7: 2, 3). Completely unique is the most massive, retouched blade-dagger, formed by parallel and scaly retouching, partially (in the proximal part?) bifacially, which is also polished on both sides, even smoothed on the upper side (Fig. 5: 3; Skakun 2008, 9, fig. 7: 5; 8).

Skakun notices that the blade products from the Luhansk grave also differ in terms of technology. The researcher is of the opinion that the specimens made of yellow and grey striped raw materials have technological features suggesting their exploitation from the cores by means of enhanced pressure – a lever, and in this respect they have much in common with the products from the KGK VI and Varna complexes studied by her. However, they differ from blade macroliths of the TC, which are – according to her – less regular and more massive, and were obtained by a different technique. She assesses the inventories of graves in Chapli and Petro Svistunovo in a similar manner to the grave goods in Luhansk (Skakun 2008, 7-8).

The retouched blade-daggers from Luhansk made of black flint stand out from all the forms of this type that have been traced in the grave complexes of the early steppe Eneolithic.

This is mainly due to the extremely regular oblique trough retouch, covering almost the entire upper surfaces of two of them. Identically regular retouching is of course known from the sites of the TC BII-C (Figs 6, 7) and the L-VC (Figs 9-12), although it would be difficult to find such perfectly made retouched blade-daggers in them.

Long blades and retouched blade-daggers are rarely part of the equipment of the graves of burial group I, dated only in the period 3800-2900 BC (Rassamakin 2004a, 183, 184, fig. 125). In this monumental work you can find only two such objects discovered in the settlement of Aleksandriya in the Donets basin (Siverskyi Donets). Due to their late chronology, they will not be described in more detail.

The settlements of the SC also produced tools formed by trough retouching. Particular mention should be made of the sites in the Serebryanska and Chernikovo Ozero in the central Siverskyi Donets basin. Despite the low-quality drawings, some of them undoubtedly show retouched blade-daggers made with this technique (Sanzharov *et al.* 2000, figs 15: 9, 10; 20: 10, 11, 13; 31: 8-10, 16?; 34 : 7) and bifacial points (Sanzharov *et al.* 2000, figs 15: 8, 13; 21: 6; 30: 1; 34: 19; 36: 3). These forms are not as spectacular as those found in the graves. They have smaller dimensions. Nevertheless, the retouching technique is identical.

The trough retouching survived in the steppe areas into the Bronze Age. It was used for the production of arrowheads of various sizes and for the final processing of the edges of large points (Razumov 2011, *e.g.*, figs 13, 15: 1-5; 24: 1-6; 26-28).

Trypillia Culture

The trough retouch in the TC inventories appears at the BI (Cucuteni A1-2) stage with the first axes and the progressive macrolithization of the blades. We have the most data from the settlements of Zalışchiki (Vynogradova 1972), Polivaniv Yar (Popova 2003) on the Middle Dnister river and from the recently analysed material from Ozheve-Ostriv (Chernovol and Radomskyi 2015; Radomskyi 2017; 2018). This cluster also includes the settlements of Horodnytsa-Horodyshche, Ozarintsy, Nyzhniy Olchedaev, Patryntsi, Vasylivka, Hrynchuky and Kadiyvtsi, on which the surveys were carried out and materials from the BI stage were obtained (Radomskyi 2018). In the inventories of all the above-mentioned sites, although with varying intensity, a parallel retouch was used, related to the trough technique, used for shaping blade tools and, above all, bifacial triangular points.

According to Tatiana Popova (2003), in the oldest settlement layers of Polivaniv Yar, associated with the transition phase from Trypillia A to BI (PJ III1) and with the BI stage (PJ III2), the presence of trough retouch can be noted only on triangular points (Popova 2003, fig. 13). In the third settlement layer (P-J II1), related to the transition from stage BI to BII, this retouching is clearly visible on retouched blades with increased metric parameters. The first flint axes appear then (Popova 2003, fig. 49). In the materials from the next layer (PJ II2) – corresponding to stage BII – trough retouching is the basic technique of

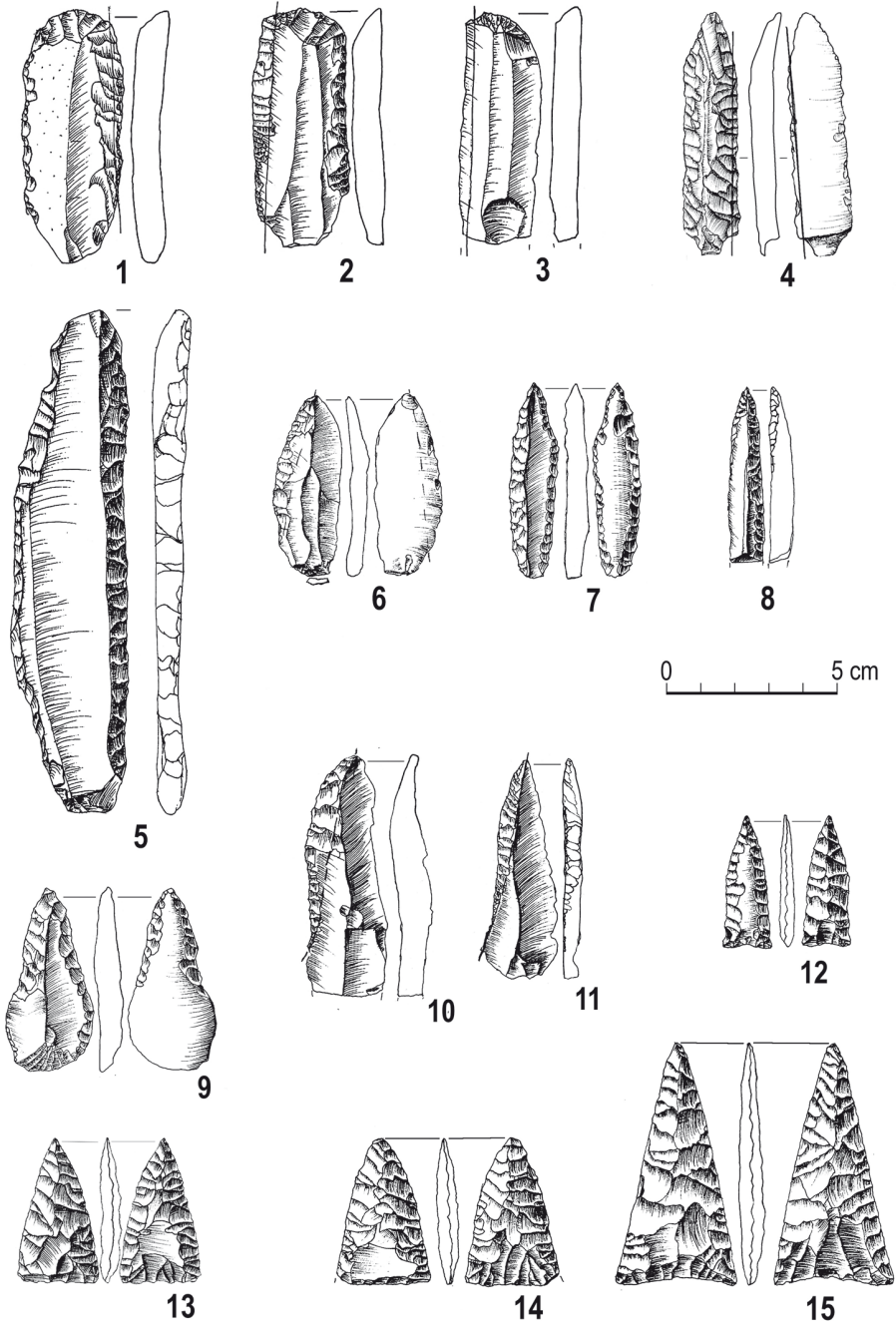


Fig. 6. Trypillia culture, phase BI: 1-5 – Ozaryntsi; 6-15 – Ozheve-Ostriv (after Radomskyi 2015; 2017; Chernovol et al. 2021)

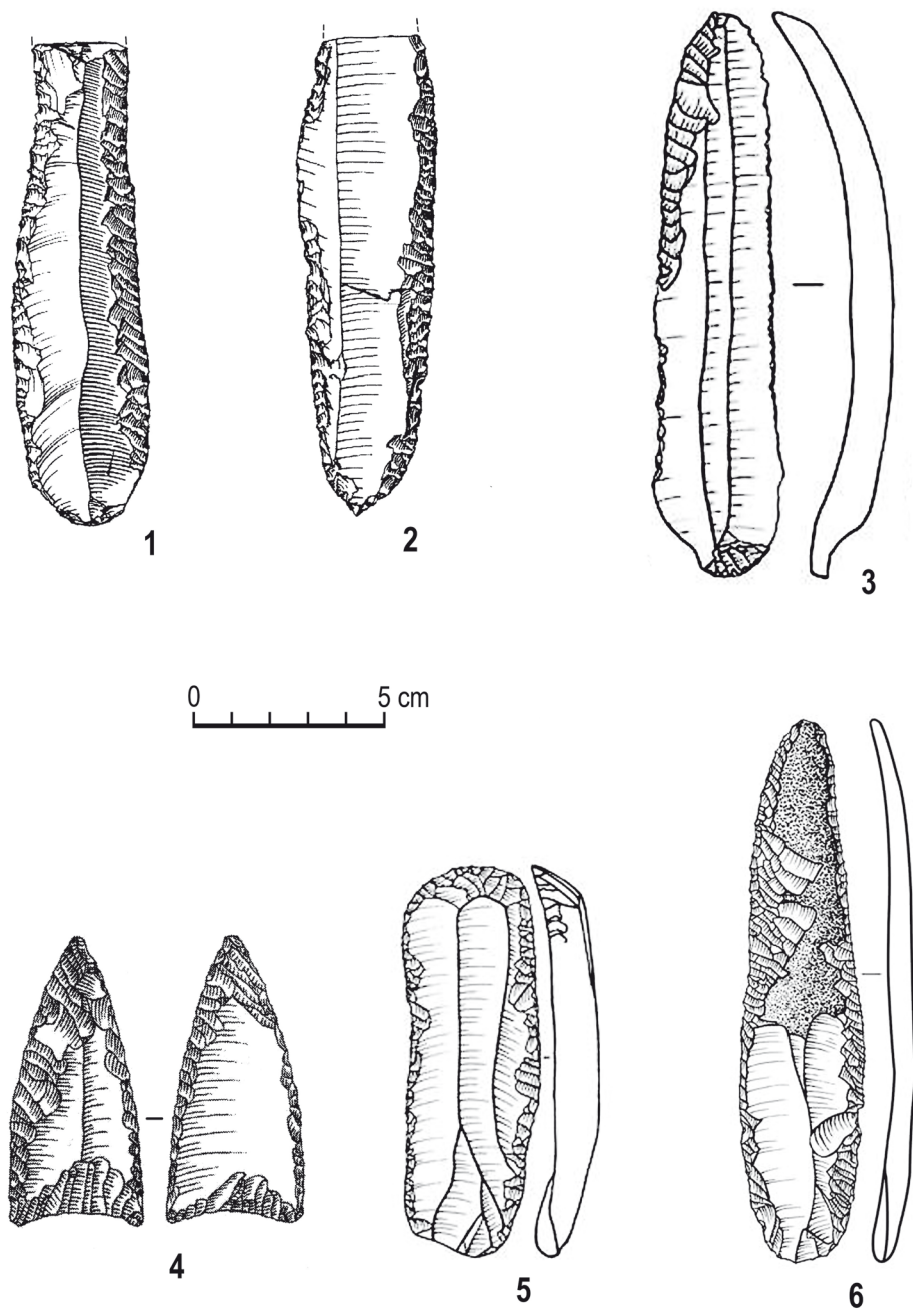


Fig. 7. Trypillia culture, phase BII-CI: 1-4 – Bodaki; 5, 6 – Brînzeni
(after Skakun 2004; Terekhina et al. 2022)

forming tools, mainly retouched blades, as well as triangular points (Popova 2003, figs 723-5, 7-10, 73: 1, 5-8). It is a similar situation in the youngest layers of the site (P-J I1-2) related to the stage CI and CII (Popova 2003 figs 83: 3-7, 9-13; 85: 3-7, 9).

The early part of the BI (BI-1) stage in the middle Dniester includes the Ozaryntsi and Horodnytsa-Horodyshche settlements (excavated sites) as well as Nyzhniy Olchedaev and Patryntsi (surface materials). In Ozaryntsi, there are double-sided, and one-sided converging blades with a classic trough retouching (Fig. 6: 1-5; Radomskiy 2018, fig. 70: 2, 7, 8, 11, 12), and most of all semi-finished products and ready-made triangular points (Radomskiy 2018, fig. 72: 4-7), as in Horodnytsa-Horodyshche (Radomskiy 2018, fig. 75: 3, 7).

From the Ozheve-Ostriv settlement, dated to the second half of the Trypole BI stage (BI-2 – Chernovol and Radomskiy 2015, 367; Radomskiy 2018, 3), there were 10,102 artefacts discovered within six houses and in the layers between them. Today this is the most fully analysed flint inventory made of the local Dniester raw material, and documents the complete production cycle, from the cores to the tools.

For forming the edges of the working tools, first of all, small rough and scaly retouching was used, but the retouch called 'parallel' by Radomskiy and the classic trough retouch (0.6% of all retouched tools – Radomskiy 2018, 120) are also recorded.

Among the tools abundantly illustrated by the author, several double-sided, convergent and one-sided retouched blades were made with it (Fig. 6: 6-8, 10, 11; Radomskiy 2018, figs 18: 10; 29: 3, 4; 34: 2; 45: 3; 58: 2; 60: 1; 64: 4, 11, 12), perforators/borers (with bifacial retouching – Fig. 6: 9; Radomskiy 2018, figs 58: 7; 64: 1, 2, 8) and basically all triangular points (Fig. 6: 12-15; Radomskiy 2018, figs 35: 1-5; 36: 1-6, 9, 10; 37: III; 38: IIb, III; 66: 18; 67; 68). The same is true for the remaining settlements of the BI-2 stage on the Middle Dniester, taken into account by Radomskiy: Vasilivka (Radomskiy 2018, figs 82: 4, 7; 85: 1, 3, 5). Attention is drawn to the presence in the assemblage from Kadiyvci Bavka of a massive endscraper and a one-sided retouched blade with a classic trough retouch (Radomskiy 2018, fig. 87: 1, 3).

In the period corresponding to Trypillia BI-BII – Cucuteni AB, parallel retouching similar to trough technique, forming retouched blades and bifacial points, are also recorded in the Southern Bug (Boh) basin (Zaets and Ryzhov 1992, figs 55: 2, 7, 14, 18; 55: 3, 13, 17; 57: 6, 11-17, 19, 20; 58: 3, 7-9, 11-16), between the Dniester and Prut region (Sorokin 1991, 27; figs 6: 7, 11, 16; 12: 8, 10; 16: 1-3, 5-8) and Prut and Seret (Marinescu-Bîlcu and Bolomey 2000, figs 33; 38: 9, 17, 22; 40: 6, 7, 16, 19; 43; 44: 1-12).

At the next stage of development – TC BII – trough retouching is already the basic technique of forming tools in the area of the entire TC range, similarly to stage C (Chernysh 1982, 207; Konoplia 1990, 22-24; Egnovatova 1993, 16, 17). We have at least a few sites from Volhynia and Podolia that have produced rich flint assemblages, including a considerable series of tools with working edges shaped with this retouching. The first place to be mentioned is the production-settlement in Bodaki, situated "on the deposits" of Volhynian flint. Many years of research by Natalia N. Skakun have produced a large series of flint

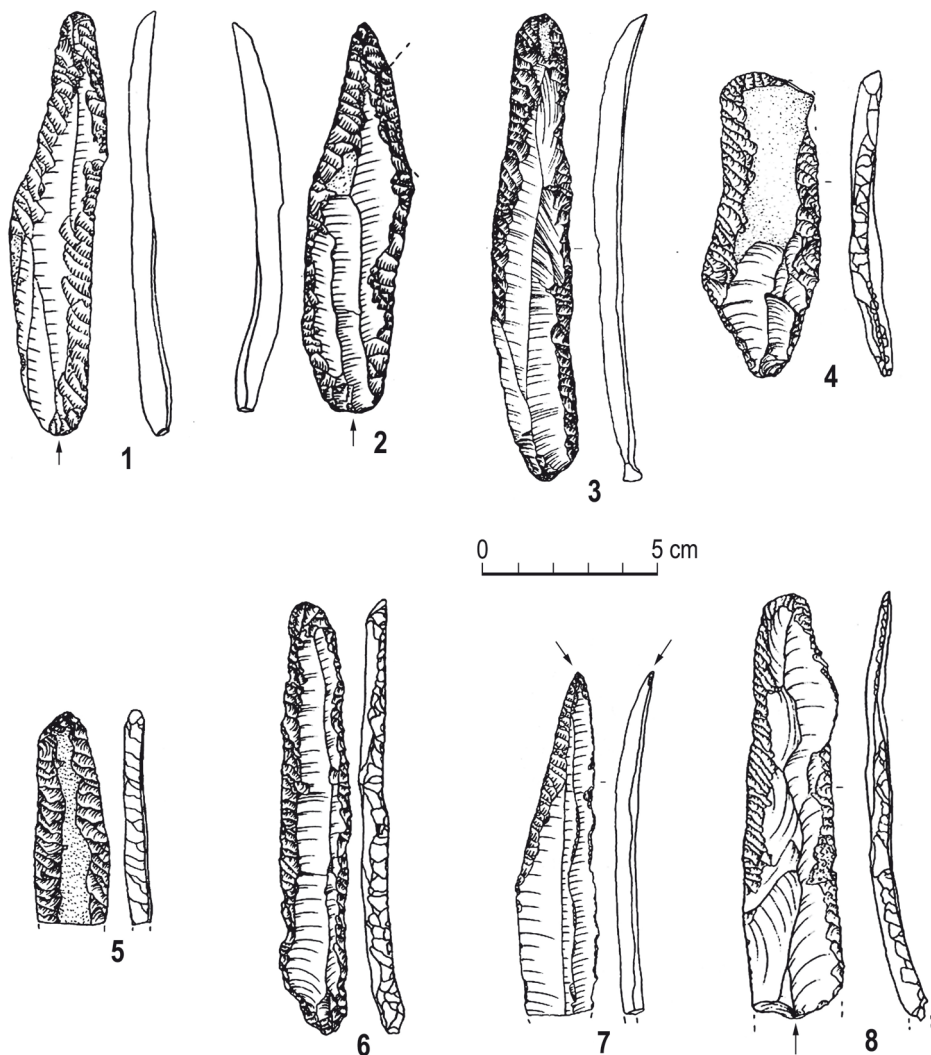


Fig. 8. Trypillia culture, phase BII-CI: Bilcze Żłote (after Kadrow *et al.* 2003)

materials, including several dozen cores for macrolithic blades (Skakun 2004, fig. 3), several hundred blades and tools. The massive converging retouched blades are noteworthy (Fig. 7: 1-3; *cf.* Skakun 2004, fig. 5: 2-4; 9: 1, 2; Trekhina *et al.* 2022, figs 2: 2; 3: 4), and triangular points (Fig. 7: 4; Skakun 2004, fig. 11: 1-6; Trekhina *et al.* 2022, fig. 3: 1) formed with trough retouching.

In the middle Dniester basin there is the Bilcze Żłote (Ogród and Werteba sites), which were inhabited from the turn of stages/phases BI/BII (Ogród I) through BII (Ogród II) to

the middle section of the CI (Ogród III) and Bılce Złote Werteba I-III, related to the CI/CII phase (Kadrow *et al.* 2003, 62-74; Kadrow 2013). The collection of 276 flint products, analyzed jointly from both sites (Kadrow *et al.* 2003, 101; Trela-Kieferling 2013), is dominated by macrolithic blade tools, mostly formed by trough retouching, mainly one-sided and concurrent double-sided retouched blades ending with endscrapers or claws (Fig. 8; Kadrow *et al.* 2003, figs 40: 1-5, 7, 12; 42: 8, 11, 12; 43: 1, 3-5, 10, 11; 47: 6, 8, 9). Some of them are in the form of retouched blade-daggers (Kadrow *et al.* 2003, 44: 10-12). Most of the endscrapers are made of retouched blade fragments with trough retouching (Kadrow *et al.* 2003, fig. 39: 1-5, 17, 16). The lack of triangular bifacial points is probably the result of the nineteenth-century methods of exploring the sites.

In other territories of the range of the TC, trough retouching was also popular in the BII stage and was used until the end of its development. Retouched blades and triangular points made with this retouch are found in the settlements located between Dniester and Prut (*e.g.*, Brynzeni, Mereșeuca-Cețățuia III – Terekhina *et al.* 2022, figs 7: 2, 5, 6; 8: 1-3, 5) and Dniester and Southern Bug (including Vladimirovka – Chernysh 1951, figs 20: 8, 11; 22: 1; 23: 2-8, 11, 15; 24: 3, 5, 6; Voroshilovka and Kurylivka – Gusiev 1995, 166, figs 47: 1, 2; 49: 2, 5, 6; 51: 1; 53: 1-15; Nemirov – Zakostselna 2017: Pl. 5.2: 5; 5.3 : 2, 3-6, 7; 5.4: 1, 2, 4, 6; 5.5: 1, 3, 4; 5.6: 2).

From the graves of stage CII come triangular points and macrolithic retouched blades ending with endscrapers and retouched blade-daggers formed with a retouch similar to a trough one (Sofiyivka, Krasny Khutor – Budziszewski 1995, figs 2: a, c; 3: a-c; 4: a; 5: a-c; 6; a-e; h: i-l).

Rzeszów phase of the Malice culture

From the dozens of sites of the late (Rzeszów) stage of the Malice culture in western Ukraine (Konoplia 1997, 63; Pozikhovskiy 2004, 320) known today, at least a few (not counting surface materials) have provided a significant series of flint materials. Among them are the settlements of Ostriv ur. Popiv Horb, Yaroslavichi ur. Bereg and Lyshe ur. Vygadanka in Volhynia (Konoplia 1990; Zakościelna 1996). The inventories of these settlements were described in detail by Vitaliy Konoplia (1990, 9, 10), and a wide selection of drawings of cores, half-products and tools is published in the work of Anna Zakościelna (1996, Pl. LI-LV). The flintwork utilised the local Volhynian flint. One-platformed blade cores from Yaroslavichi ranged in height from 26 to 153 mm (Zakościelna 1996, Pl. LIII: 1, 2), and in Ostriv – from 73 to 263 mm (Zakościelna 1996, Pl. LI: 1, 2).

The blades are metrically diverse, including macrolithic ones (up to 187 mm in length in Yaroslavichi). In the large collection of tools, retouched blades predominate over burins and endscrapers. The share of truncated blades, perforators and borers as well as triangular points is much smaller. One of the basic techniques for tool formation is trough retouching, especially for forming edges of one-sided, double-sided and tapered retouched

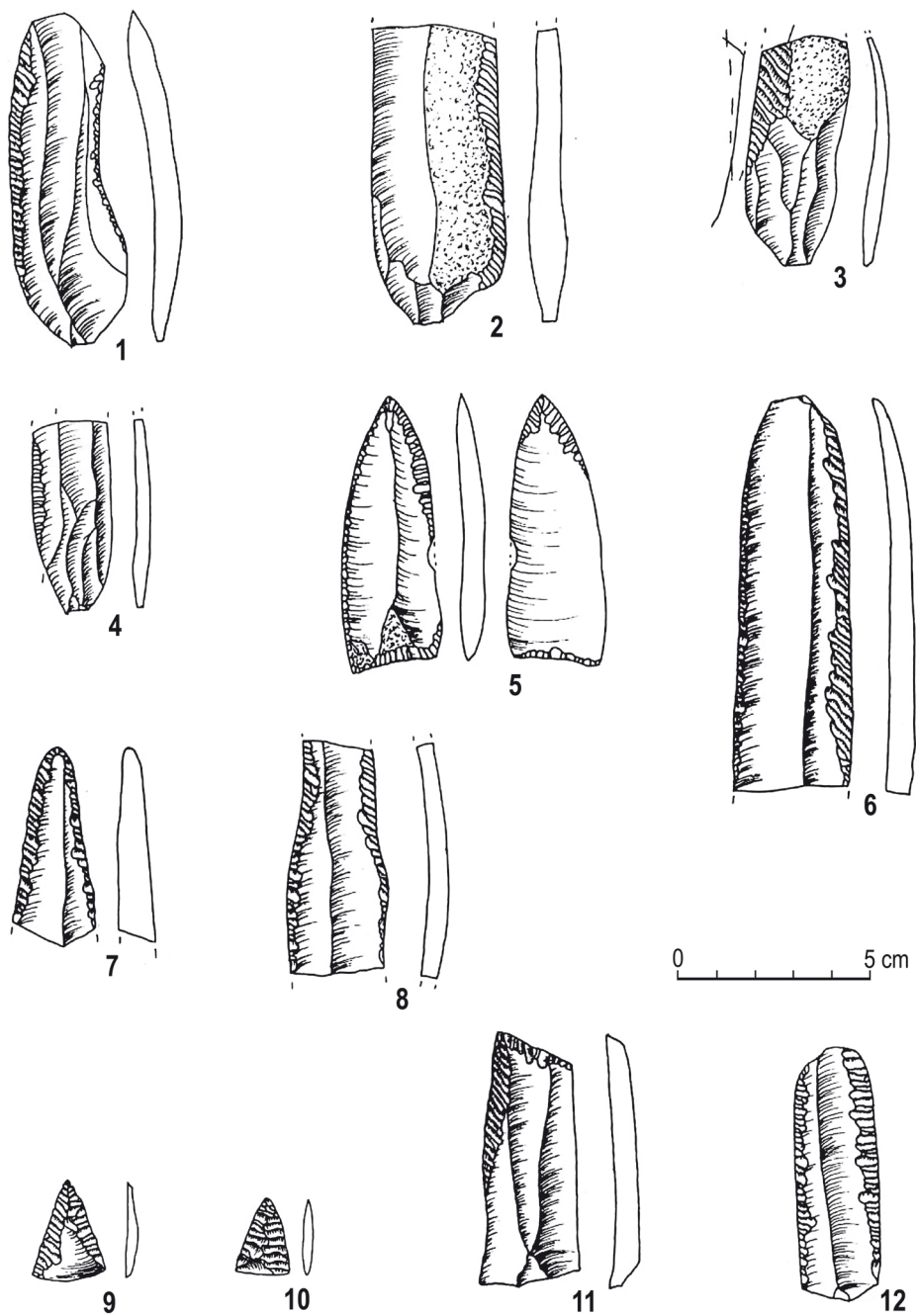


Fig. 9. Malice culture, Rzeszów phase: 1-5 – Ostriv- Popiv Horb; 6-10 – Jaroslavichi-Bereg; 11, 12 – Lyshche-Vygadanka (after Zakościelna 1996)

blades and points (Fig. 9). Konoplia states (1990, 9-10) that this retouching occurs in Ostrov on 27.1% of 'knives' (retouched blades) and 50% of sickle inserts and all blades (Zakościelna 1996, Pl. LII: 2-4, 919, 20). In Lyshch, it appears on 17.7% of 'knives' (retouched blades) and 60% of sickle inserts and all blades (Zakościelna 1996, Pl. LV: 5, 6, 11, 13, 20, 21). It is also present in Yaroslavichi (Zakościelna 1996, Pl. LIV: 1-6, 16-20). There are no retouched blade-daggers in these settlement inventories. Triangular points with a straight or indented base are numerous, they are retouched bifacially, but rarely on the whole surface. Some of them are over 6 cm long (Zakościelna 1996, Pl. LII: 19). One Las Stocki truncated blade was recorded (Fig. 9: 11); Zakościelna 1996, Pl. LV: 6), a form characteristic of L-VC inventories in the western zone of its range (Zakościelna 1996, 61, 92, 93).

Lublin-Volhynia culture

Trough retouching was used to shape working edges of endscrapers and other parts of these tools, the points of massive perforators, some truncated blades, and most of all triangular points and retouched blades (Zakościelna 1996, 56, 60-70, 92, 93). The most complete application of the trough retouch was used in the production of retouched blades (Figs 10-13).

In the inventories of settlements in Wąwolnica, site 6 and Las Stocki, site 7, for which it was possible to make statistics, 23.8% and 36% of all tools, respectively, were made with a trough retouch, and among retouched blades as many as 82.5% and 88.7% (Zakościelna 1996, 92, 93; Libera and Zakościelna 2013, 219). The above statistics prove that the ability to use this retouching technique was common and did not fall within the scope of manufacturing specialization.

The most magnificent and perfectly made tools the so-called retouched blade-daggers – come from L-VC graves (Zakościelna 2008; 2010). The basic characteristics of these products are macrolithic dimensions (length from 154 to 219 mm, with a width of 26-39 mm and a thickness of 7-12 mm), the use of classic through retouching and the use of only Volhynian flint for their production (Zakościelna 2008, 578; 2010, 139, 142). The method of forming retouched blade-daggers is varied. In some cases, a trough retouch only shapes the top and slightly overlaps the side edges (Fig. 12: 2, 3; Zakościelna 2008, fig. 1: 1; 2: 1, 2; 3: 2). In other cases, it shapes one full edge and the other in sections (Figs 12: 1, 4; 13: 3; Zakościelna 2008, figs 2: 4; 3: 1). The processing is rarely almost circumferential (Fig. 13: 1, 2; Zakościelna 2008, fig. 1: 2, 3).

Retouched blade-daggers are part of the grave equipment of a small part of male burials, the richest ones, which are also accompanied by other socially valued items, the so-called prestige artefacts (Zakościelna 2008, 586; 2010, 187-189). They were discovered in exposed places, mainly around the head and on the chest, less often around the waist of buried males (Zakościelna 2008, 583). The second location is particularly significant, as it

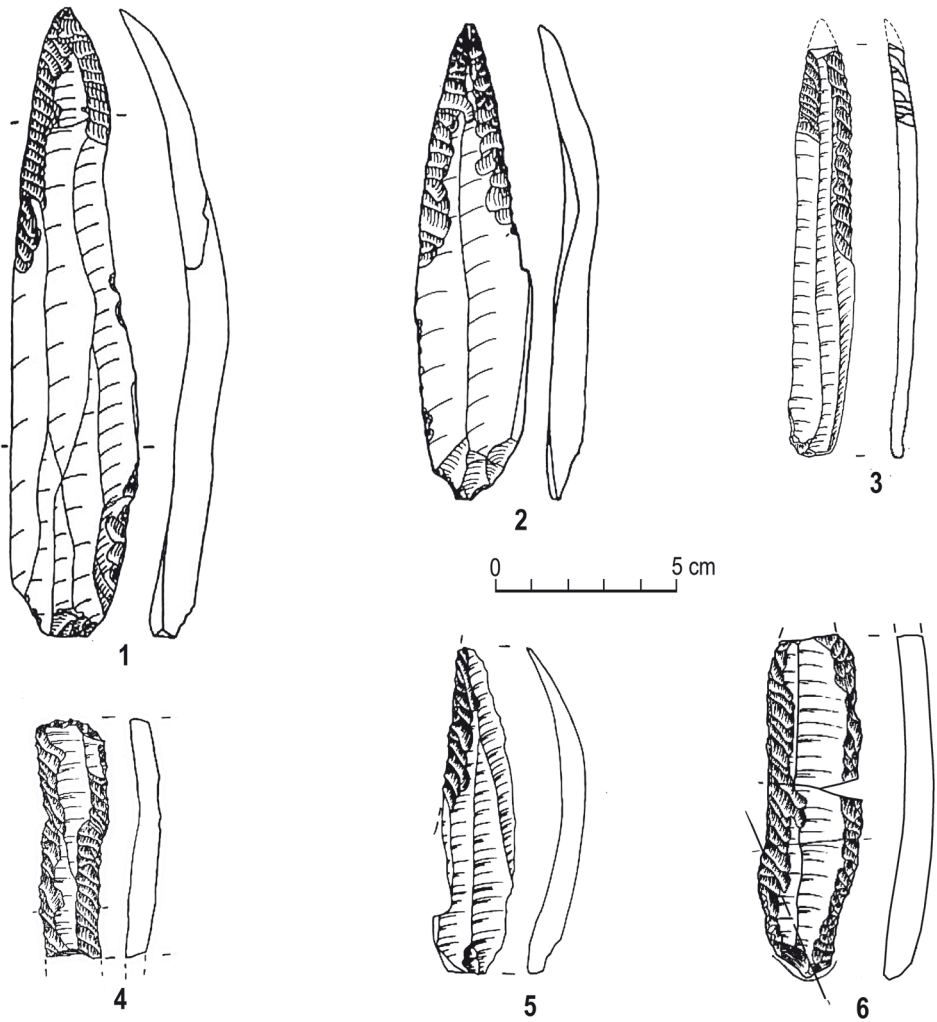


Fig. 10. Lublin-Volhynia culture: 1, 2 – Kosina 35; 3, 4 – Las Stocki 7; 5, 6 – Wąwolnica 6 (after Zakościelna 1996)

informs us that they were worn on the breasts during their lifetime, which meant that they fulfilled important social roles and conveyed messages about the high status of their owners (Wilk 2006, fig. 5; Zakościelna 2008, fig. 5: A). In such a position, retouched blade-daggers were discovered in grave 5 in Książnice 2, grave 1 in Gozdów 1 and grave 2/1987 in Gródek 1C. In the latter case, the man had two retouched blade-daggers on his chest (Zakościelna 2008, fig. 5: A).

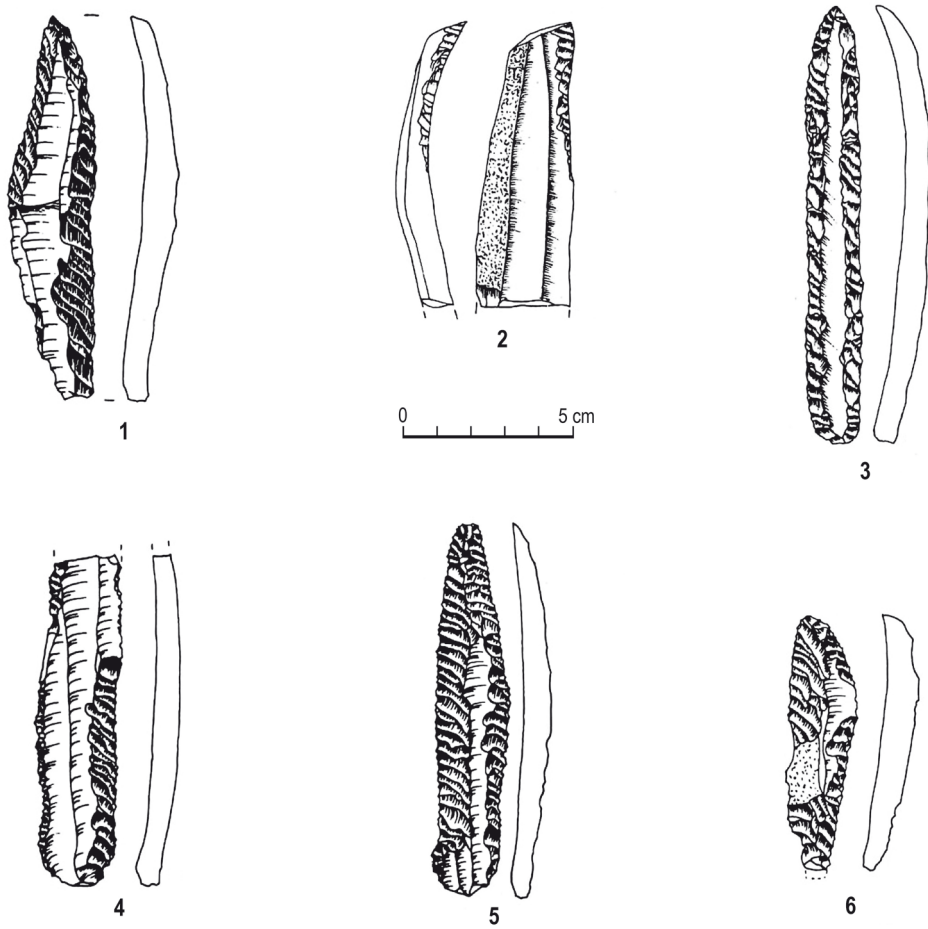


Fig. 11. Lublin-Volhynia culture: 1 – Wąwolnica 6; 2, 3 – Złota „Grodzisko I, II”; 4-6 – Radelichi III „Zastruga” (after Zakościelna 1996)

Triangular points are the second category of L-VC products made exclusively with trough retouching. They come from both settlements (Gródek 1C, Las Stocki – Zakościelna 1996, 66-70, Pl. VI: 3-7; XXII: 19) and graves (Gródek 1C, graves I and VI, Strzyżów 26, graves 2 and 7, Tyszowce, grave 1, Rovantsy – Zakościelna 2010, Pl. XI: 3, 4; XVIa: 1; LXIIa: 13; LXVI: 1; LXX: 6-7; LXXXVIII: 6, 7). They were produced from flakes and blades. They have a triangular shape, and differ in the shape of the sides (straight, convex, concave) and bases (straight, convex, concave) and the degree of bifacial treatment, which does not always completely remove the original surfaces (Zakościelna 1996, fig. 9). The triangular points known from L-VC settlements and graves are small. Their height ranges

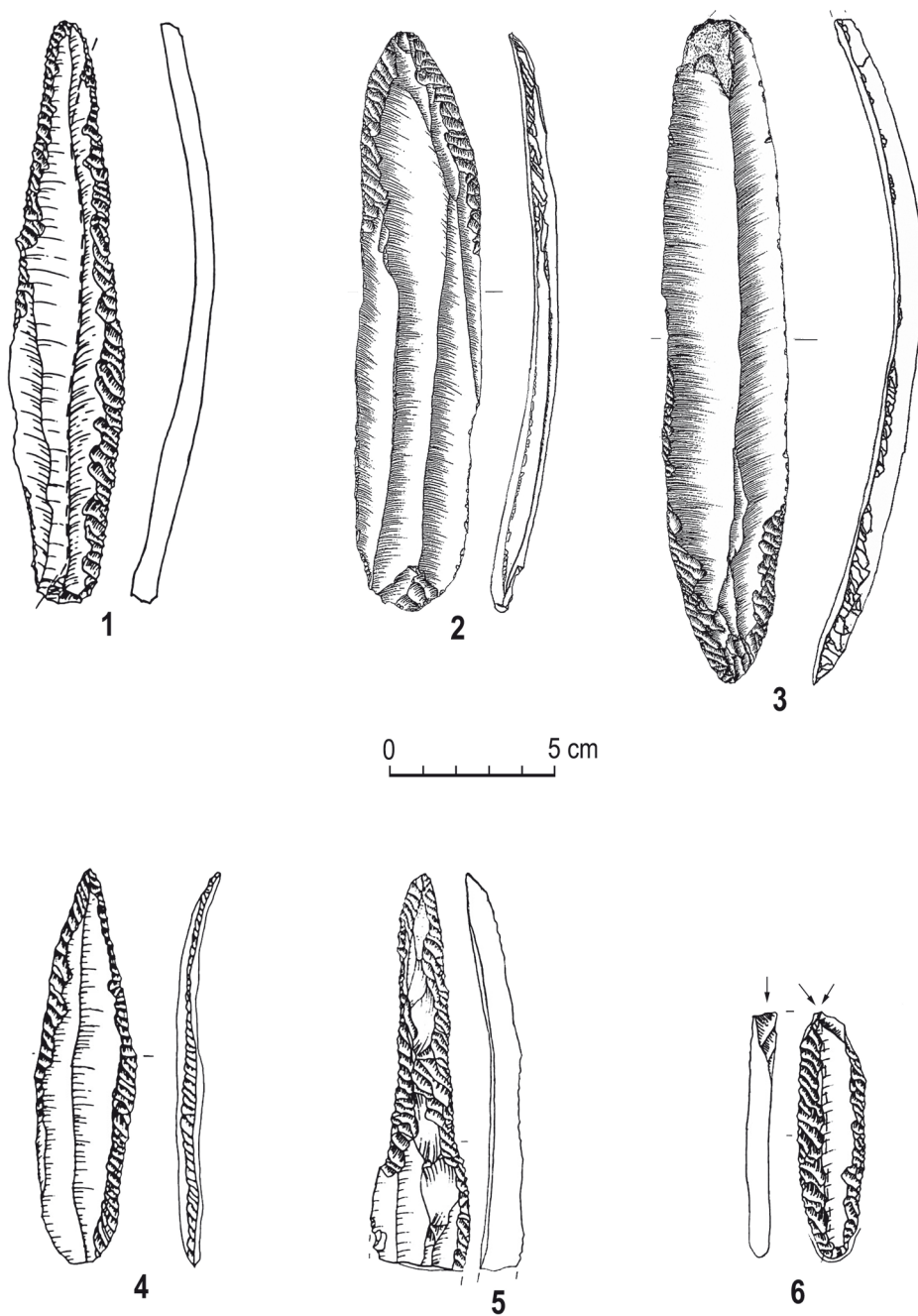


Fig. 12. Lublin-Volhynia culture: 1 – Gródek 1C, grave VI; 2, 3 – Gródek 1C, grave 2/1987; 4 – Moniatycze Kolonia, grave 2; 5-6 – Tyszowce 3, grave 1 (after Taras and Zakościelna 1999; Zakościelna 2010)

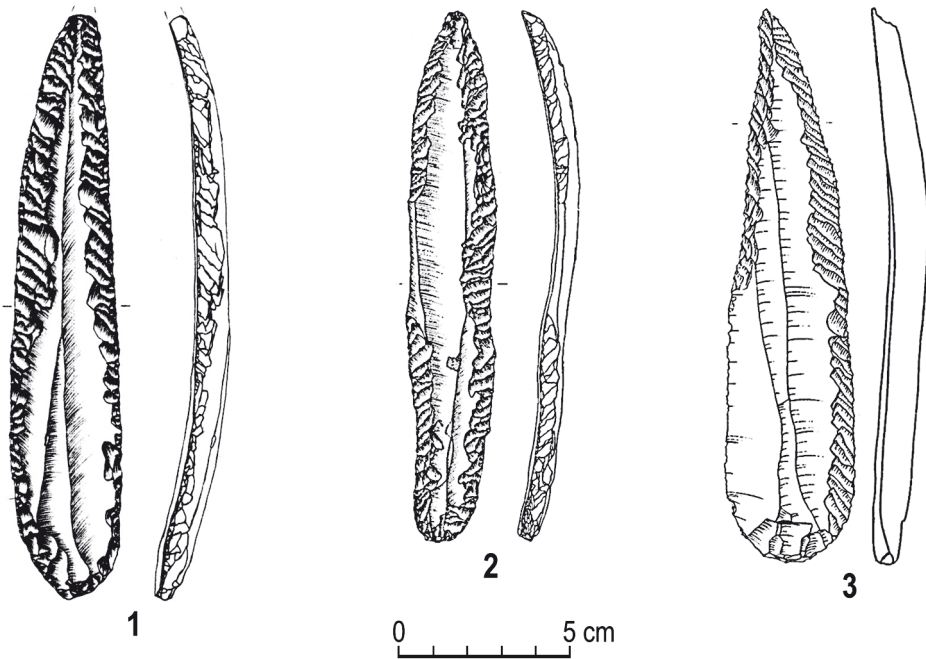


Fig. 13. Lublin-Volhynia culture: 1 – Książnice 2, grave 5; 2 – Sitaniec Wolica 3, grave 1; 3 – Złota „Grodzisko II”, grave 101 (after Zakościelna 2006; 2010)

from 14 to 32 mm, and the width of the base ranges from 11 to 29 mm. Most likely, larger specimens were also produced, reaching 60-70 mm in length. However, they are known so far only from destroyed sites (Łuck, ur. Lug – Zakościelna 1996, Pl. XLV: 20) or loose finds (Strzyżów I/II, Gródek 1C – Chmielewski 2008).

Summarizing the issue of the trough retouch in L-VC, we can confidently quote the conclusions of J. Libera and A. Zakościelna, who reviewed the Eneolithic and Bronze Age inventories in Poland and stated (Libera and Zakościelna 2013; 228; *cf.* also: Zakościelna and Libera 2014, 198):

“1. Classic trough retouching... as the ability to form the edges of working tools/weapons we find only in the Lublin-Volhynian culture. It was commonly used in all settlement regions, regardless of the type of flint raw material. It had a universal character, with the help of it not only retouched blades, but also truncated blades and triangular points, as well as some endscrapers, perforators and burins were formed. It is a feature that unifies the image of flint-making of this culture in its entire range, and in Poland it can be treated as a cultural determinant.

2. In other Eneolithic cultures, it is found sporadically and should be interpreted as a manifestation of the relationship with the L-VC (in the case of well-documented finds),

or as evidence of an older settlement of this culture in these sites. In the case of the Funnel-Beaker culture, especially the Małopolska group, relations with the TC in the borderland of these formations also come into play.”

DISCUSSION

The oldest products co-shaped by the classic trough retouch in the form of retouched blades (including retouched blade-daggers) and bifacial blades are found in the SC. The literature on the subject presents various views on the genesis, taxonomy, terminology, functioning and the role of steppe cultures in the early Eneolithic. For this reason, we present below a brief overview of the most important positions in this area.

Early Eneolithic on the Pontic and Azov steppes – a brief overview of views

In the well-known approach of Marija Gimbutas (1977), the notion of ‘kurgan culture’ and the migration of horse warriors from the steppes to the west, the main effect of which was the destruction of ‘Old Europe’, are of key importance. In the last version of her proposal around 5000 BC on the Volga, the Samara culture appeared. It was followed by the KC (1st half of the 5th millennium BC), and in the middle of the 5th millennium BC, we are dealing with the Yamna culture (hereafter: YC). The Sredny Stog II culture was an archaeological trace of the first migration of this population from the Volga area towards the Dnieper and the Pontic steppes. This happened in the period 4400-4300 BC (Rassamakin 1999, 60; 2020, 27, 28).

In the proposal of N. Y. Merpert (1965), referring to the Gimbutas proposal discussed above, the Sredny Stog II culture was created on the Dnieper on the basis of the local Neolithic culture. Then the discussed culture merged with the YC migrating from the east, creating its specific, local variant on the lower Dnieper (Rassamkin 1999, 60; 2020, 28, 29).

V. N. Danilenko (1974) sees two trajectories of Eneolithic development in the steppes. The first is represented by the development sequence of the early YC, and the second is the lower levels of the Mikhailovka settlement on the Lower Dnieper. The YC was established on the Caspian Sea. The Berezhnovka phase moving westwards contributed to the shift of the Sredny Stog culture to the Dnieper (Danilenko 1974, 85, 86). This combined with pastoral steppe cultures such sites as: Suvorovo, Casimcea, Kainar (on the lower Danube), Petro-Svistunovo and Novodanilovka (on the Dnieper; *cf.* Rassamakin 1999, 60-62; 2020, 28).

D. Y. Telegin (1973) developed a periodization of the Sredny Stog culture, in which he included all groups older than YC from the area between the Don and the Dnieper (includ-

ing the sites of Lower Mikhailovka, Dereivka and Aleksandriya). However, he excluded sites of the Novodanilovka type from it (Rassamakin 1999, 62; 2020, 29).

Yuriy Rassamakin (1999; 2004a) rejected the current chronological and cultural divisions. He based his basic divisions on the categorization of burials, taking into account the basic features of the funeral rite (Rassamakin 1999, 72, fig. 3.4; 2004a, 23-61, fig. 1; 2020, 30-33). Only the older graves of the second burial group (category/tradition) are related to the early Eneolithic (Rassamakin 2004a, 180-182, fig. 125).

The oldest materials from the steppes between the Dnieper and the Don are associated with the SC. This is dated to the entire early Eneolithic period (4550-4100 BC – Rassamakin 1999, 64, 65, fig. 3.2; 4750-4100 BC – Rassamakin 2004a, 180-182, fig. 125) or generally to the second and third quarter of the 5th millennium BC (Rassamakin 2020, 38-40).

Pottery from the site of Strilcha Skelya (also present in the settlements in Aleksandriya, Razdorskoe, Semenovka) differs from the pottery of the Sredny Stog II culture. The set of artefacts from Skelya contains long blades, triangular points, flat stone axes and stone horse-headed sceptres. Such a typical set of remains from SC graves is repeated at the sites of TC BI – BII, possibly also in BII (Rassamakin 1999, 83). Sredny Stog ceramics refer only to the late phase of SC (Rassamakin 1999, 75-77). On the other hand, the ceramics of SC are identical to the Cucuteni C kitchen ceramics, which occur at the CC A3-A4 – TC BI phase sites (Rassamakin 1999, 77).

The above-mentioned stone remains and ceramics typical of the SC are also found on the sites of CTCC (respectively phase A-B1 and BI-BII). However, there is no Sredny Stog II pottery at all on these sites (Rassamakin 1999, 79).

The Early Eneolithic in the steppes – a model of functioning

The transition from the Neolithic to the Eneolithic in the steppes was conditioned by the appearance of two cultural complexes: KGK VI and CTCC (respectively phase A3-A4 and BI; Rassamakin 1999, 100; 2004a, 180-182). The first of them was a producer, and the second was an intermediary in the transfer of prestigious items to the steppe population (Rassamakin 1999, 124, fig. 3.49: 1). The area above the Lower Danube played a key role in this (Suvorovo complexes and the Cernavoda I culture). In turn, the population of the SC passed them further east to the lower Volga and south-east to the Caucasus foreland (Rassamakin 1999, 100).

At the beginning of the Eneolithic, the first imports of TC BI ceramics appeared in the Neolithic sites on the Dnieper in the forest-steppe zone (Kyiv-Cherkassy culture). They also reached the steppe (Nikolskoe cemetery – ceramics, gold, copper and mace-head) and at the Lysogorskoe cemetery (Spondylus bracelet).

On the other hand, the ceramics of the SC, zoomorphic sceptres, proto-cheek-pieces made of bone, triangular points, flat flint axes and long retouched blades are found in

various proportions on the CTCC settlements (respectively in phases A3-A4 and BI; in Berezovskaya Hydroelectric Station – almost all these monuments appeared together; Rassamakin 1999, 102).

Prestige items are being exchanged in the Pontic region at this time. It was a key moment for the steppe communities, tantamount to the beginning of the Eneolithic in this region (Rassamakin 1999, 100).

Imports of prestigious items appeared mainly where the SC was formed. The official zone of elite graves is the region of this culture, where there are also settlements Strilcha Skelya, Aleksandriya, Razdorskoe I – level 4 and 5.

The prestigious objects of the Skelya culture also include retouched blades and bifacial points with trough retouching made of flint and obsidian (Rassamakin 2004a, 207, fig. 137). Among the above-mentioned retouched blades there are also those resembling daggers (*e.g.*, Kut, mound 8, tomb 7 – Rassamakin 1999, 84, fig. 3.18).

In the early Eneolithic, numerous mines and flint workshops operated on the Siverskyi Donets. They produced triangular bifacial points, tetrahedral axes and long blades, known from the graves of the elite. The discussed mines and workshops were part of the prestige item exchange system (Rassamakin 1999, 103, 104).

Pottery of the SC was discovered on TC BI settlements on the Dniester in Polivaniv Yar III and Vasilivka. There were also flint workshops there. They were perhaps inspired by the manufacturers from the Siverskyi Donets region.

Hiatus

In the period 4100(?)–3900/3800 BC, graves of the early horizon of the second (II) burial group (Rassamakin 2004a, 182) disappear in the areas west of the Dnieper. On the Dnieper, the graves of the mentioned burial group belong to the Sredny Stog II culture (Rassamakin 2004a, 206).

This period (hiatus) is respectively synchronized with the phases AB2 and BII of the CTCC (Rassamakin 2004a, 205, fig. 136). It begins with the disappearance of the Gumelnița culture settlements, which are no longer present in the A4 phase of the CC. This was the result of the crisis in agriculture caused by climate change from 4200 BC (Diachenko 2019, 74–76). Then the system of exchanging prestigious items on the steppes disappears like the entire Skelya culture (Rassamakin 1999, 103).

The increasing drying of the climate in the period 4100–3800 BC led to increasing migration from the middle Dniester basin to the northeast and the formation of giant settlements in the Sieniucha basin between the Southern Bug and the Dnieper (Diachenko 2019, 76). Perhaps the same climatic changes resulted in the colonization of the southern part of the Volhynia Upland at the sources of the Styr and Horyn rivers by the population of the TC of BII phase.

The origin of the trough retouch in L-VC

If there were no retouched blade-daggers shaped by the classic trough retouch in the SC and L-VC cultures, the question of the origin of this retouching in the latter cultures would be obvious.

From the exploitation and production centres of flint on the Siverskyi Donets and from the areas of elite graves located in vast areas to the east of the Dnieper, through the Middle Dnister TC complexes from phase BI, the trough retouch would pass to the population of the MC from the Rzeszów phase, inhabiting the Volhynia Upland in the upper reaches of the river Styr and Horyń or directly to the population of L-CV, born at that time (from about 4250 BC).

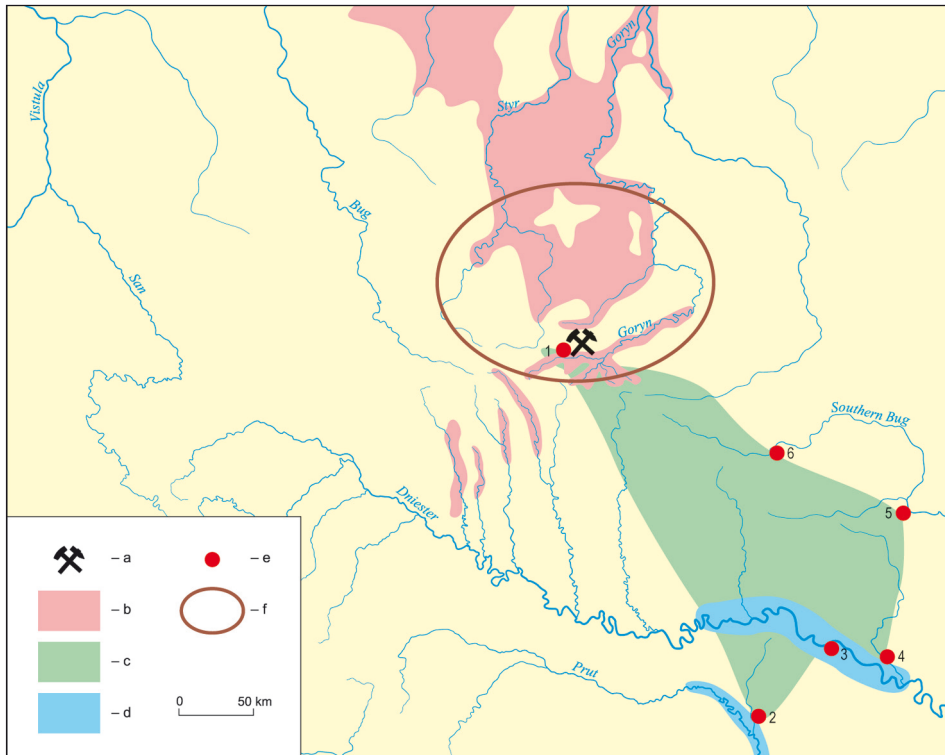


Fig. 14. Schematic map of access to flint raw materials for the population of TC settlements from the BII phase: a – mines of Volhynian flint; b – deposits of Volhynian flint; c – Volhynian flint circulation area between the TC settlements from the BII phase; d – deposits of the Prut and Dniester flint; e – TC sites from the BII phase, where products made of Volhynian flint were found f – Rzeszów Phase of Malice culture. 1 – Bodaki; 2 – Brinzeni VIII; 3 – Mereșseuca-Cetățuia; 4 – Busha; 5 – Voroshilovka; 6 – Sosny (after Terekhina *et al.* 2022; prepared by Elena Starkova and Maria Juran)

However, retouched blade-daggers are present only in the graves of the SC and L-VC culture elites. So far, they have not been registered in the TC or MC of the Rzeszów phase. As prestigious items, they could only circulate in the communities where these elites functioned. Thus, they had to be transferred directly from the steppe environment to the population of the early stage (postulated only and empirically not yet confirmed) of L-VC, in which the processes of social hierarchy had to reach a certain degree of advancement.

At the same time, the process of transferring to L-CV the skills and practice of trough retouching in the alternative way, *i.e.* through and with the participation of the inhabitants of the Rzeszów phase of the MC, has one serious consequence. It forces us to accept the thesis about the specificity of the settlement agglomeration of the aforementioned cultural unit on the upper Styr and Horyn area, where the above-mentioned process took place. Only the local population of MC adapted blade macrolithization, triangular bifacial points and trough retouching, in contrast to the upper Bug region, Rzeszów-Przemyśl loess area or the Lublin and Sandomierz Uplands.

This specificity was the result of the processes of heterogenization and cultural hybridization, intensifying in certain areas at specific periods of time (cf. Kadrow *et al.* 2021, 154-157). They favored the weakening of cultural boundaries and the generation of new identities and cultural forms (Barker 2005, 293-295). The reason for their intense activity in the described area could be outcrops of Volhynian flint (Fig. 14), an attractive raw material sought, among others by the Polgar communities of the upper Tisza river basin.

CONCLUSIONS

The theses presented above are logical consequences of the time-space relations between important elements of the cultural puzzle in the vast area of eastern Europe between the delta of the Danube in the west and the Don in the east, and between the Black Sea in the south and Volhynia in the north (Fig. 1) in the second half of the 5th millennium BC.

These theses require empirical verification. In the area of the upper Styr and Horyń basin in Volhynia, which is of key importance for the genesis of L-VC, several sites should be selected for excavation in order to obtain sources that will: illuminate the transformation process of MC into L-VC, reveal the co-determining external cultural impulses, allow the construction of their absolute chronology, provide samples for the analysis of DNA and stable isotopes to determine the contribution of the populations of various cultural units to its course.

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References

- Barker C. 2005. *Studia kulturowe. Teoria i praktyka*. Kraków: Wydawnictwo Uniwersytetu Jagiellońskiego.
- Bodianskyi O. V. 1968. Eneolitychniy mogylnyk bilia s. Petro-Svystunove. *Arkheologiya* 21, 117-125.
- Budziszewski J. 1995. Flint materials from cemeteries of the Sofievka type. In A. Koško (ed), *Cemeteries of the Sofievka type: 2950-2750 BC (= Baltic-Pontic Studies 3)*. Poznań: Adam Mickiewicz University, Institute of Eastern Studies, Institute of Prehistory, 148-189.
- Chernovol D. and Radomskiy I. 2015. Kremyani vistrya tripolskogo peselenniya Ozheve-Ostriv. In O. Dyachenko, F. Menotti, S. Ryzhov, K. Bunyatyan and S. Kadrow (eds), *Kulturnyy kompleks Kukuten-Trypillia ta ego susidy. Zbirka naukovykh prats pamyati Volodymyra Krutsa / The Cucuteni-Trypillia Cultural Complex and its neighbours*. Kyiv, Rzeszów: Institute of Archaeology National Academy of Science of Ukraine, Institute of Archaeology of the University of Rzeszów, 367-383.
- Chernovol D., Zhelaga D. and Radomskiy I. 2021. Porivnannya pamyatok rannogo Trypillia ta Trypillia BI: ploshchadki, keramika, kremin. In O. Diachenko, T. K. Harper, Yu. Rassamakin and I. Sobkowiak-Tabaka (eds), *Data Systematization in the Neo-Eneolithic of Southeastern and Central Europe: Essays in honor of Sergej Ryzhov*. Kyiv: National Academy of Sciences of Ukraine. Institute of Archaeology, 79-126.
- Chernysh E. K. 1951. Tripolskie orudia truda s poseleniya u. s. Vladimirovki. *Kratkiye soobshcheniya Instituta istorii materialnoy kultury* 40, 85-95.
- Chernysh E. K. 1982. Eneolit pravoberezhnoy Ukrainy i Moldavii. In V. M. Masson and N. Ya. Merpert (eds), *Eneolit SSSR*. Moskva: Izdatelstvo 'Nauka', 165-320.
- Chmielewski T. 2008. Some remarks on unique Eneolithic bifacial projectile points from Western Volhynia. *Acta Archaeologica Carpathica* 42-43, 417-425.
- Danilenko V. N. 1974. *Eneolit Ukrainy*. Kiev: Naukova dumka.
- Diachenko A. 2019. Does the social field cause or accelerate social and cultural changes? The case of Eneolithic Cucuteni-Tripolye cultural complex. In S. Kadrow and J. Müller (eds), *Habitus? The Social Dimension of technology and Transformation (= Scales of Transformation in Prehistoric and Archaic Societies 3)*. Leiden: Sidestone Press, 71-85.
- Egnovatova A. V. 1994. *Kremnevaya industriya tripolskoy kultury (po materialam pamyatnikov dnestro-dneprovskogo mezhdyyechia)*. Avtoreferat disertatsii na soiskane uchenoy stepeni kandydata istoricheskikh nauk. Moskva.
- Gimbutas M. 1977. The first wave of Eurasian pastoralists into Copper Age Europe. *The Journal of Indo-European Studies* 5, 277-339.
- Gusiev S. M. 1995. *Trypilska kultura Sredneho Pobuzhzhya*. Vinnytsya: Anteks.
- Kadrow S. 2013. Werteba site in Bilcze Złote: recent research and analyses. In S. Kadrow (ed.), *Bilcze Złote. Materials of the Tripolye culture from Werteba and Ogród sites (= Biblioteka Muzeum Archeologicznego w Krakowie 5)*. Kraków: Muzeum Archeologiczne w Krakowie, 13-21.

- Kadrow S., Krzywda A. and Naglik R. 2021. The Wyciąże Group and Other Heterogeneous Cultural Entities During the Fourth Millennium BC in Central Europe. In A. Diachenko, T. K. Harper, Y. Rassamakin and I. Sobkowiak-Tabaka (eds), *Data Systematization in the Neo-Eneolithic of Southeastern and Central Europe: Essays in honor of Sergej Ryzhov*. Kyiv: National Academy of Sciences of Ukraine. Institute of Archaeology, 149-161.
- Kadrow S., Sokhachiy M., Tkachuk T. and Trela E. 2003. Sprawozdanie ze studiów i wyniki analiz materiałów zabytkowych kultury trypolskiej z Bilecza Złotego znajdujących się w zbiorach Muzeum Archeologicznego w Krakowie. *Materiały Archeologiczne* 34, 53-143.
- Kolesnik A. V. 2012. Portativnye kremnevye „kladny-prinosheniya” kamennogo veka i eneolita. Aspekt yugo-vostochnoy Ukrainy. *Donetskiy arkeologichniy zbirnik* 16, 29-46.
- Kolesnik A. V. 2017. Donetskiy tsentr kremneobrobotki v kamennom veke – eneolite. *Istoricheskaya i sotsialno-obraovatelnaya mysl / Historical and Social-Educational Ideas* 9(1/1), 59-62.
- Kolesnik A. V. 2019. The First Miners of the Donbass. *Vestnik of Saint Petersburg University. History* 64/2, 599-620 (In Russian).
- Konoplia V. 1990. Lendelskaya kultura. In A. P. Chernysh (ed.), *Arkheologiya Prikarpattya, Volyni i Zakarpattya. Eneolit, bronza i rannee zhelezo*. Kiev: Naukova dumka, 4-17.
- Konoplia V. 1997. *Starozhytnosti Volini*. Lviv: Lvivskiy Istorichniy Muzey, Natsionalna Akademiya Nauk Ukrainy, Instytut Arkheologii, Reginalniy Naukovo-Doslidniy Tsentr Ryativna Arkheologichna Sluzhba.
- Libera J. and Zakościelna A. 2013. Retusz rynienkowaty w eneolicie i wczesnej epoce brązu na ziemiach polskich. In M. Nowak, D. Stefański and M. Zając (eds), *Retusz – jak i dlaczego? „Wieloperspektywiczność elementu twarżowego” (= Prace Archeologiczne 66. Studies)*. Kraków: Wydawnictwo i Pracownia Archeologiczna Profil-Archeo, 215-239.
- Marinescu-Bilcu S. and Bolomey A. 2000. *Drăgușeni. A Cucutenian Community*. București: Editura Enciclopedică.
- Merpert N. Y. 1965. O svyazakh Severnogo Prichernomoria i Balkan v rannem bronzovom veke. *Kratkiye soobshchenniya Instituta arkheologii (KSLIA)* 105, 10-20.
- Pislariy I. A., Krotova A. A. and Klochko T. N. 1976. Pogrebene epokhi eneolita v. g. Voroshilovgrade. In S. S. Berezanskaya et al. (eds), *Eneolit i bronzoviy vek Ukrainy*. Kiev: Naukova Dumka, 21-28.
- Popova T. A. 2003. *Mnogosloynoe poselene Polivanov Yar. K evolutsii kultury v Srednem Podnestrove*. Sankt-Petersburg: Rossiyskaya Akademiya Nauk, Muzey Antropologii i Etnografii im. Petra Velikogo (Kunstkamera).
- Posikhovskiy O. 2004. Poselenniya lendel-polgarskoy kulturno-istorichnoy spilnoti bilia sela Vilbivne na Volyni (za materialami rozkopok 2002 roky). *Arkheologichni doslidzhenniya Lvivskogo Universitetu* 7, 320-328.
- Radomskiy I. 2015. Kamyaniy inventar s poselenniya Ozheve-Ostriv za materialami doslidzhen 2013 g. In L. L. Zaliznyak (ed.), *Do 90-richchya Yu. G. Kolosova (= Kamyana doba Ukrainy 6)*. Kyiv: Instytut Arheologiyi Natsionalnoy Akademiyi Nauk Ukrayiny, 225-238.
- Radomskiy I. 2017. Genesis kremnevoy industrii Tripolya B/I v Srednem Podnestrove. *Revista Arheologică serie nouă* 13/1-2, 22-40.

- Radomskiy I. S. 2018. *Kremiana industrija tripolskogo naselennia etapu BI srednogo Podnistrovia (za materialami poseleeniya Ozheve-Ostriv)*. Kyiv (PhD. Typescript) https://shron1.chtyvo.org.ua/Radomskiy_Ivan/Kremiana_industriia_tripilskoho_naselennia_etapu_VI_Serednoho_Podnistrovia_za_materialamy_poseleeniya.pdf – access 11.01.2022.
- Rassamakin Y. 1999. The Eneolithic of the Black Sea Steppe: Dynamics of Cultural and Economic Development 4500-2300 BC. In M. Livine, Y. Rassamakin, A. Kislenko and N. Tatarintseva, *Late prehistoric exploitation of the Eurasian steppe*. Cambridge: McDonald Institute for Archaeological Research, 59-182.
- Rassamakin J. J. 2004a. *Die nordpontische Steppe in der Kupferzeit. Gräber aus der Mitte des 5. Jts. bis Ende des 4. Jts. v.Chr. Teil 1 – Text (= Archäologie in Eurasien 17)*. Mainz: Verlag Phillip von Zabern.
- Rassamakin J. J. 2004b. *Die nordpontische Steppe in der Kupferzeit. Gräber aus der Mitte des 5. Jts. bis Ende des 4. Jts. v.Chr. Teil 2 – Katalog. Tafeln (= Archäologie in Eurasien 17)*. Mainz: Verlag Phillip von Zabern.
- Rassamakin J. J. 2020. Das Frühäneolithikum der Don-Dnepr-Region (zweites bis drittes Viertel des 5. Jts. v. Chr.): einige Probleme der Interpretation von archäologischen Denkmälern. In S. Hansen (ed.), *Repräsentationen der Macht. Beiträge des Festkolloquiums zu Ehren des 65. Geburtstages von Blagoje Govedarica (= Kolloquien zur Vor- und Frühgeschichte 25)*. Wiesbaden: Harrassowitz Verlag, 27-43.
- Razumov S. M. 2011. Flint artefacts of northern Pontic populations of the early and Middle Bronze Age: 3200-1600 BC (based on burial material). *Baltic-Pontic Studies* 16, 7-325.
- Sanzharov S. N., Britiuk A. A., Kotova N. S. and Chernykh E. A. 2000. *Poseleniya neolita – ranney bronzy Severskogo Dontsa*. Lugansk: Izdatelstvo VNU.
- Skakun N. N. 2004. Predvaritelnye rezultaty izucheniya materialov tripolskogo poseleniya Bodaki (kremneobratyvyusche komplekxy). In G. F. Korobkova (ed.), *Orudiya truda i sistemy zhizneobezpecheniya naseleniya Evrazii*. Sankt-Peterburg: Evropeyskiy Dom, 57-79.
- Skakun N. N. 2008. Les grandes lames de silex du mobilier des proto-éleveurs du sud de l'Europe orientale. *Préhistoriques Méditerranéennes* 14, 105-120.
- Skakun N. N. 2012. Osobennosti kremneobratyvyuschego proizvodstva razvitogo etapa Tripolskoy kultury (po materialam poseleniya Bodaki). In S. A. Vasilev and V. Ya. Shumkin (eds), *Mezolit i neolit vostochnoy Evropy: khronologiya i kulturnoe vzaimodeystvie*. Sankt-Peterburg: Rossiyskaya Akademiya Nauk, Institut istorii materialnoy kultury, Muzey Antropologii i etnografii imeni Petra Velikogo (Kunstkamera), 316-330.
- Sorokin V. Ya. 1991. *Orudiya truda i khozyaystvo plemen srednogo Tripolya Dnestrovsko-Prutskogo mezhdurechiya*. Kishinev: Shtinitsa.
- Taras H. and Zakościelna A. 1999. Groby ludności kultury wołyńsko-lubelskiej ceramiki malowanej na stanowisku 3 w Tyszowcach. *Archeologia Polski Środkowowschodniej* 4, 16-21.
- Telegin D. Y. 1973. *Srednostogivska kultura epokhy midi*. Kyiv: Naukova dumka.
- Telegin D. Ya., Nechitaylo A. L., Potekhina I. D. and Panchenko Yu. V. 2001. *Srednostogivskaya i novodanilovskaya kultury eneolita azovo-chernomorskogo regiona*. Lugansk: Vydavnytstvo 'Shlyakh'.
- Terekhina V. V., Skakun N. N. and Biciaev V. M. 2022. On the Issue of Consumer Settlements of Flint Products from the Tripolye Settlement-Workshop of the Bodaki in Phase BII. In N. Anusheva,

- I. V. Chechuskov, I. Stepanov, M. Ankushev and P. Ankusheva (eds), *Geoarchaeology and Archaeological Mineralogy. Proceedings of 7th Geoarchaeological Conference, Miass, Russia, 19-23 October 2020*. London, Berlin, New York: Springer, 267-287.
- Trela-Kieferling E. 2013. Stone Artefacts. In S. Kadrow (ed.), *Bilcze Złote. Materials of the Tripolye culture from Werteba and Ogród sites (= Biblioteka Muzeum Archeologicznego w Krakowie 5)*. Kraków: Muzeum Archeologiczne w Krakowie, 49-52.
- Tsveybel D. S. 1970. Drevnie kremnevye vyrabotki u s. Shirokoe v Donbase. *Sovetskaya Arkheologiya* 1, 227-233.
- Vynogradova N. M. 1973. Tripilske poselennya Zalishchiki na Dnistri. *Arkheologiya* 8, 68-70.
- Wilk. S. 2006. Graves of the Lublin-Volhynian Culture at Site 2 in Książnice District of Busko Zdrój. 2004 Exploration Seasons. *Sprawozdania Archeologiczne* 58, 247-270.
- Wilk S. 2018. Can we talk about the Copper Age in Lesser Poland? Contribution to the discussion. In P. Valde-Nowak, K. Sobczyk, M. Nowak and J. Żrałka (eds), *Multas per Gentes et Multa per Saecula. Amici Magistro et Collegae suo Ioanni Christopho Kozłowski Dedicant*. Kraków: Institute of Archaeology Jagiellonian University, 485-493.
- Zakościelna A. 1996. *Krzemieniarstwo kultury wołyńsko-lubelskiej ceramiki malowanej*. Lublin: Wydawnictwo UMCS.
- Zakościelna A. 2006. Flint Inventory of Graves of the Lublin-Volhynia Culture on Site 2 in Książnice, Busko Zdrój District / Inwentarz krzemienny grobu nr 5 kultury lubelsko-wołyńskiej ze stanowiska 2 w Książnicach, pow. Busko Zdrój. *Sprawozdania Archeologiczne* 58, 271-291.
- Zakościelna A. 2008. Wiórowce-sztylety jako atrybuty pozycji społecznej mężczyzn kultury lubelsko-wołyńskiej. In J. Bednarczyk, J. Czebreszuk, P. Makarowicz and M. Szmyt (eds), *Na pograniczu światów. Studia z pradziejów międzymorza bałtycko-pontyjskiego*. Poznań: Wydawnictwo Poznańskie, 577-591.
- Zakościelna A. 2010. *Studiū obrzǎdku pogrzebowego kultury lubelsko-wołyńskiej*. Lublin: Wydawnictwo UMCS.
- Zakościelna A. and Libera J. 2014. The Reception of South-Eastern Cultural Patterns: Late Neolithic and Nascent Bronze Age Flint Working in the Vistula Drainage Basin. The Case of Trough-like Retouch. In A. Koško (ed.), *Reception Zones of 'Early Bronze Age' Pontic Culture Traditions: Baltic Basin – Baltic and Black Sea Drainage Borderlands, 4/3 mil. to First Half 2 mil. BC (= Baltic-Pontic Studies 19)*. Poznań: Adam Mickiewicz University, Institute of Eastern Studies, Institute of Prehistory, 189-201.
- Zakostselna A. 2017. Kremnevyy i kamennyy material tripolskoy kultury iz raskopok Nemirovskogo gorodishcha. Kollektzii Gosudarstvennogo Ermitazha. In G. I. Smirnova, M Yu. Vakhtina, M. T. Kashuba and E. G. Starkova (eds), *Gorodishche Nemirov na reke Yuzhnyy Bug. Po materialam passkopok w XX veke iz kollektzii Gosudartsvennogo Ermitazha i Nauchnogo arkhiva IIMK RAN*. Sankt-Peterburg: Gosudarstvenniy Ermitazh, Rossiyskaya Akademia Nauk, Institut istorii materialnoy kultury, 259-275.
- Zaets I. I. and Ryzhov A. N. 1992. *Poselene tripolskoy kultury Klishchev na Yuzhnom Buge*. Kiev: Tellus.