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## KAMIANETS-PODILSKYI (TATARYSKY) IN THE MIDDLE TRYPILLIA FLINT NETWORKS OF FOREST-STEPPE UKRAINE

### ABSTRACT

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The paper presents the results of technological, typological, raw material and use-wear analyses of stone assemblage from the Kamianets-Podilskyi (Tatarysky) site, dated to 3950-3900 BC (the late Trypillia BII). The assemblage is presented against a broad comparative background of sites from Forest-Steppe Ukraine. Flint processing focused on blades production, intended subsequently for the making of tools, produced of good quality raw material (mainly of Turonian Age). However, preferences in the use of raw material changed, depending on the region and the site.

Keywords: Western Trypillia culture, Volhynian flint, flint assemblage, use-wear analysis, flint networks

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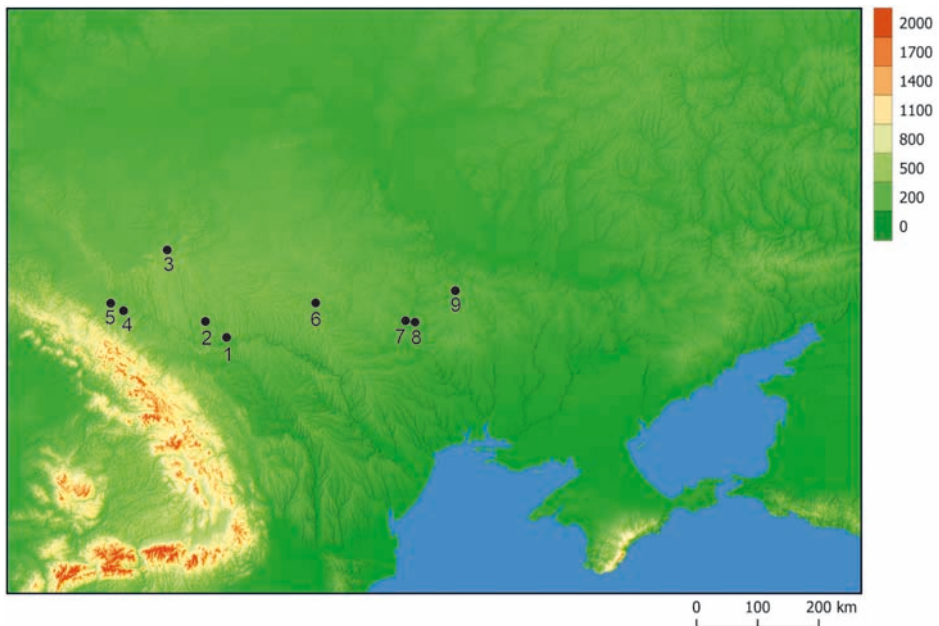
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## INTRODUCTION

Trans-regional networks of transportation and distribution of raw materials and semi-fabricates have been discussed in archaeology for decades. Besides raw materials *per se*, such long-distance connections transported knowledge, ideas and traditions. In numerous cases, materials and information flow through the networks resulted in transmission of innovation packages. For instance, ceramic styles were passed along with the copper tools or ornaments. In the case of Cucuteni-Trypillia cultural complex (5000-3000/2950 BC), and especially its Trypillia components, Eastern Trypillia and Western Trypillia cultures (Ryzhov 2021; Tsvek 2006), long-distance networks of raw material transportation are evident from the distribution of Volhynian (Turonian Age) flint. The ongoing work of Natalia Skakun and co-authors (2018; see also Spinei 2019) on the flint, extraction, processing and distribution over the wide areas is a significant step towards understanding of the Cucuteni-Trypillia contact networks, while closer analysis of the results is possible through the introduction of the available evidence into scientific circulation.

This paper discusses the assemblage of flint tools from the excavations in Kamianets-Podilskyi (Tatarysky), the late Trypillia BII site in the Middle Dniester region (Fig. 1). This site, dated to 3950-3900 BC is chronologically similar to the well-known settlement of



**Fig. 1.** Location of Trypillia BII sites considered in this study. 1 – Kamianets-Podilskyi (Tatarysky), 2 – Verteba, 3 – Bodaky, 4 – Cherniatyn, 5 – Vikrotoriv, 6 – Voroshylivka, 7 – Nebelivka, 8 – Volodymyrivka, 9 – Andriyivka (Drawing by M. Stróżyk, I. Sobkowiak-Tabaka)

Bodaky, the inhabitants of which probably specialized in flint processing. Both sites are attributed to the Mereșeuca group of the Western Trypillia culture (Diachenko and Sobkowiak-Tabaka 2021; cf. Ryzhov 2003; Tkachuk 2019). Here we present the technological and typological characteristics of data associated with the house remains known as “Trypillia ploshchadka” (Diachenko *et al.* 2021) and the area around the pottery kilns (Diachenko and Sobkowiak-Tabaka 2020). Further on, we discuss the results of use-ware analysis, and remind the reader of the several issues of interpreting flint assemblages in the context of early farmers’ subsistence strategies.

## 1. LITHICS

In the course of archaeological excavations carried out on the site in 2019-2021, almost 100 flint and stone artefacts were unearthed. Most of them were discovered in Ploshchadka 1 (72 flint items, two made of quartzite, three made of sandstone), while 21 artefacts occurred also near the pottery kilns. The technological characterization of the materials is based on the dynamic typology concept of R. Schild *et al.* (1975, 12, 13) and the typological analysis uses the characteristics of particular groups of tools defined by B. Balcer (1983, 197-207).

### 1.1. Material from the pottery kilns

#### Debitage

The assemblage obtained from the area of the pottery kilns excavated on the site consisted of nine pieces ofdebitage, 10 tools and two nodules of raw material. To the first category of artefacts belong: two cortical flakes (28 × 22 × 7 mm and 79 × 67 × 21 mm); five flakes from single platform cores (from 21 × 29 × 4 mm to 39 × 22 × 4 mm), a fragment of blade from a single platform core and a chunk.

#### Tools

In the group of tools were two endscrapers, two truncations, one perforator, two arrowheads, one retouched blade and one retouched flake, plus one undetermined fragment of tool.

The **endscrapers** are made of flakes from single platform cores and have similar dimensions (40 × 27 × 8 mm and 44 × 32 × 13 mm). In the first example, the tool’s end is oblique, high and step. The right edge is denticulated retouched and on the left one the retouch is tiny). In the second case, the working edge is asymmetrically rounded, medium high and medium step (Fig. 2: 10).

The **truncations** are made of flakes from single platform cores and have very similar dimensions (51 × 28 × 10 mm – Fig. 2: 9 and 54 × 24 × 7 mm – Fig. 3: 10), made of flakes

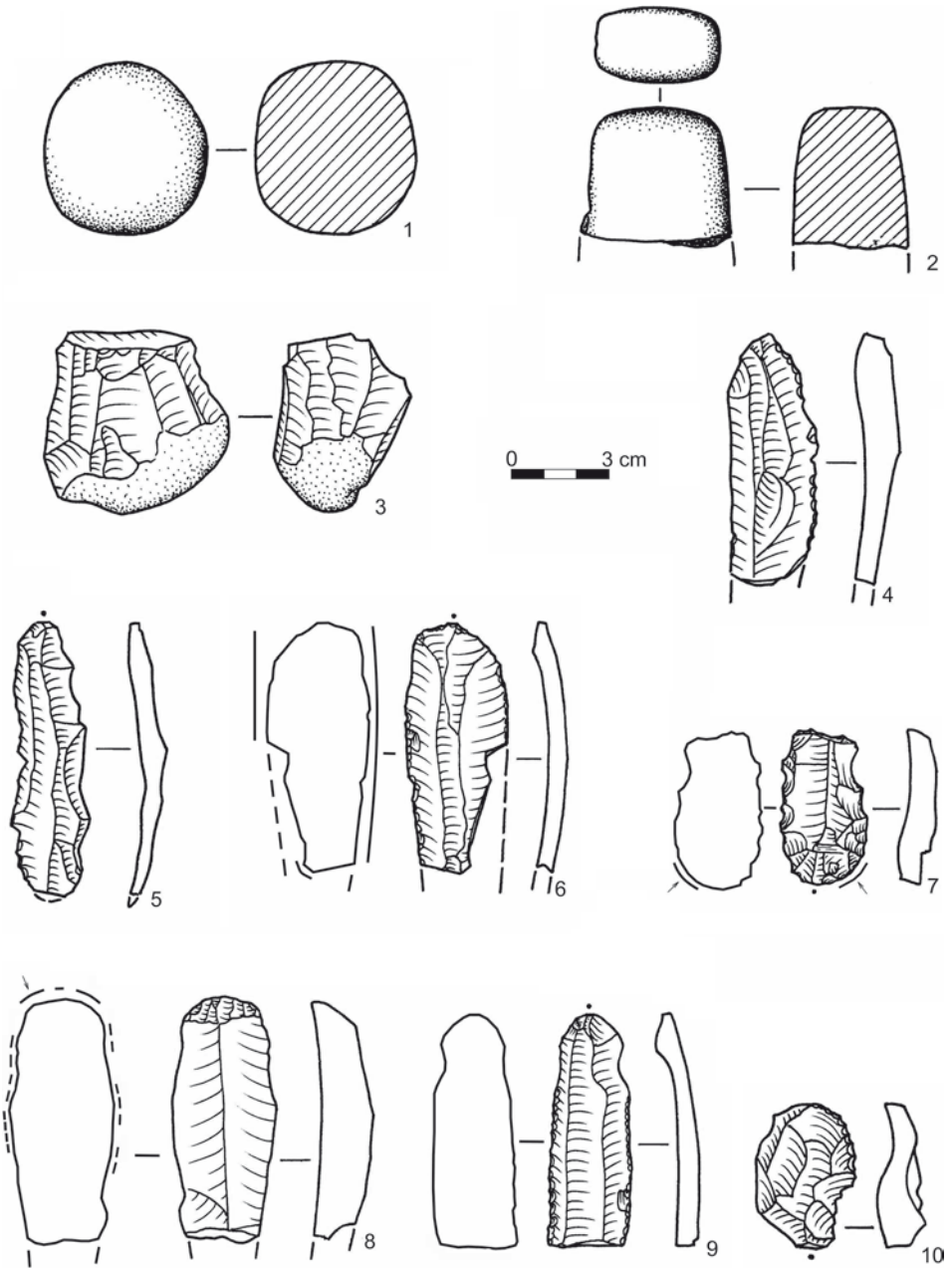


Fig. 2. Kamianets-Podilskyi (Tatarysky).

1, 3-10 – flint artefacts; 2 – fragment of artefact made of sandstone. Line – traces of use, discontinuous line – contact traces, arrow – use direction

(Drawing D. Kushtan, B. Kufel-Diakowska, I. Sobkowiak-Tabaka)

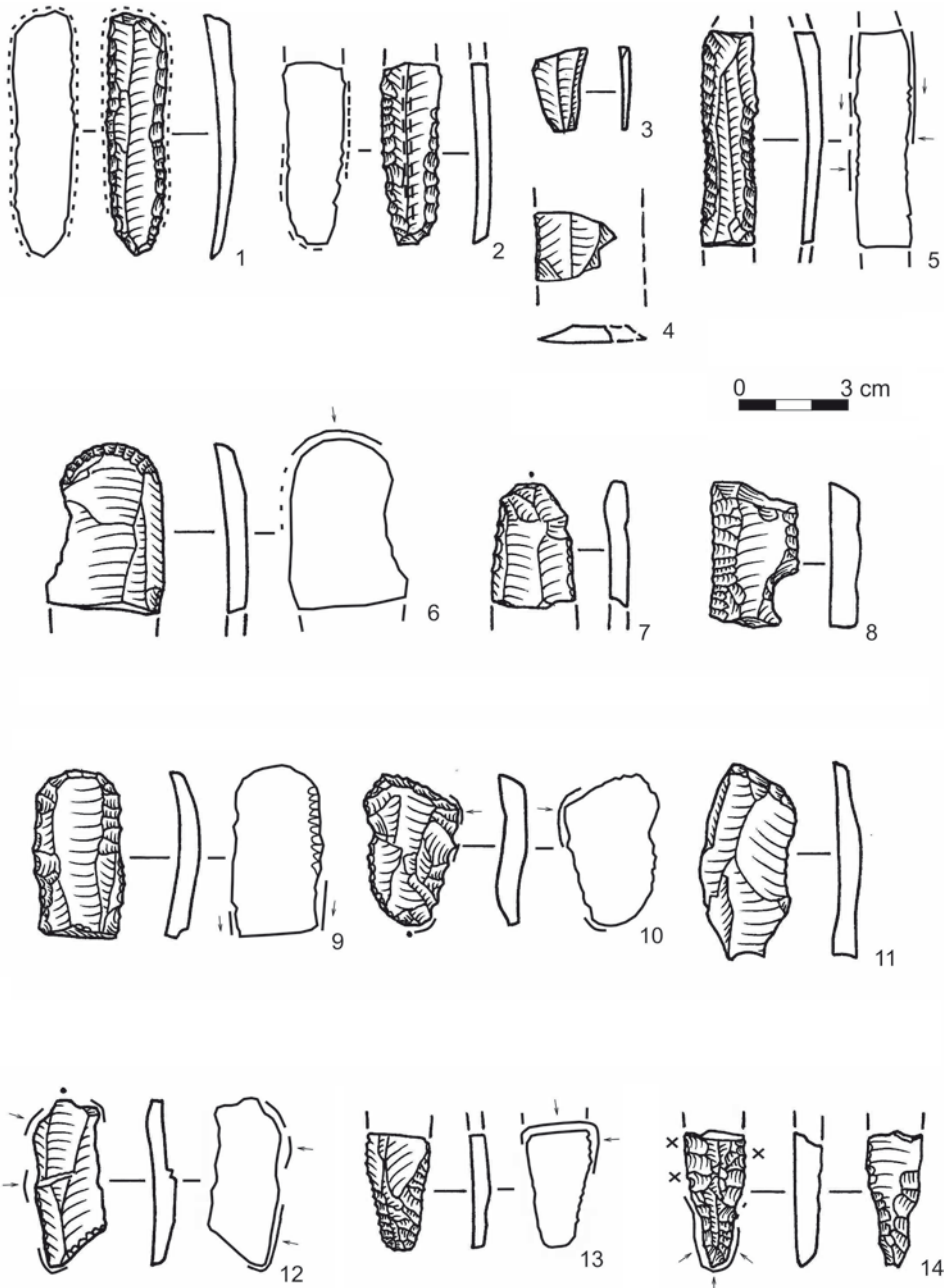


Fig. 3. Kamianets-Podilskiy (Tatarysky). Flint artefacts.

Line – traces of use, discontinuous line – contact traces; arrow – use direction; cross – hafting  
 (Drawing D. Kushtan, B. Kufel-Diakowska, I. Sobkowiak-Tabaka)

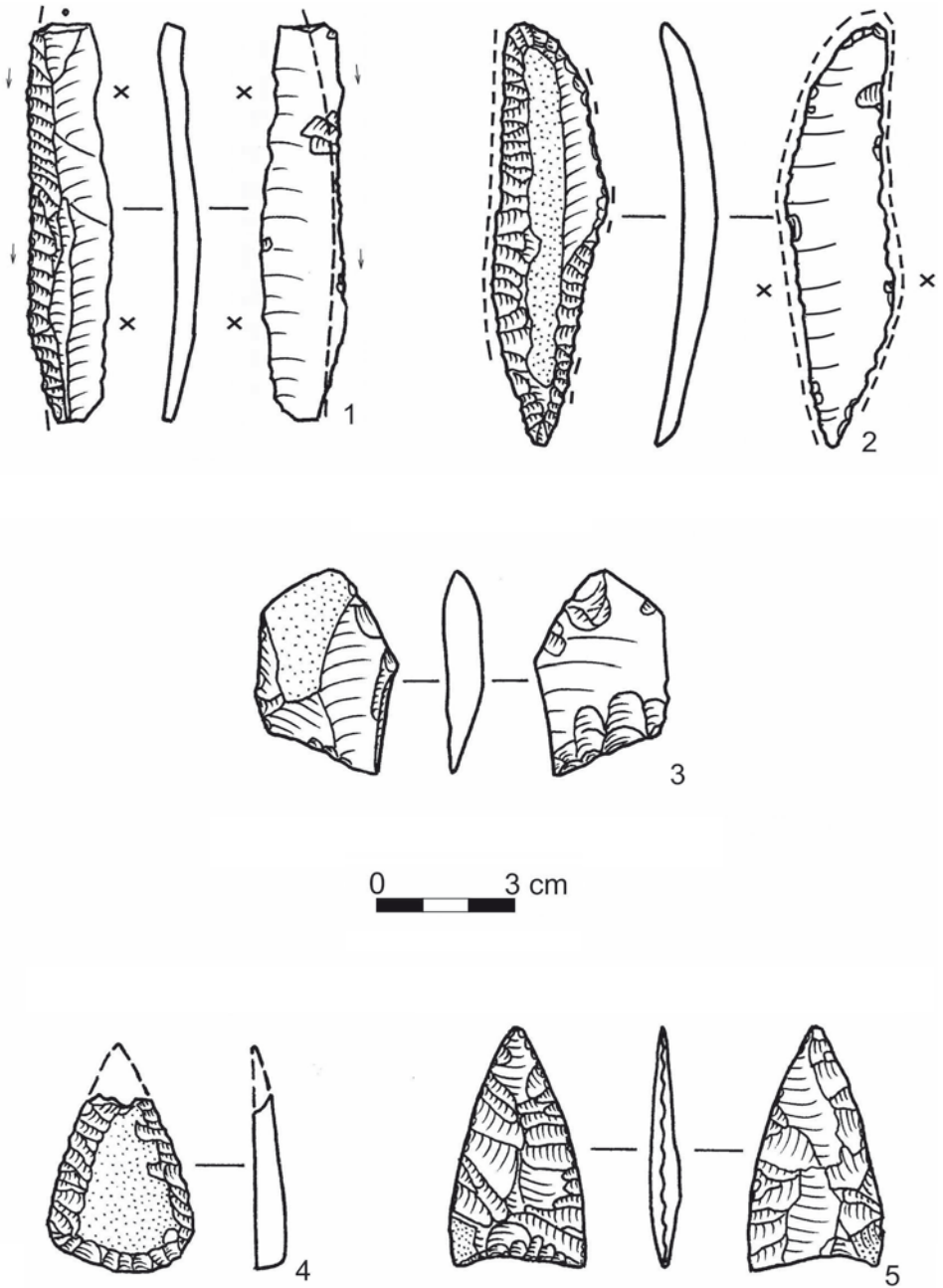


Fig. 4. Kamianets-Podilskyi (Tatarysky). Flint artefacts.  
 Discontinuous line – contact traces; arrow – use direction; cross – hafting  
 (Drawing D. Kushan, B. Kufel-Diakowska, I. Sobkowiak-Tabaka)

from single platform cores. Both tools have oblique truncations, formed in the proximal and distal part of the flakes. In case of the smaller truncation, both edges of tool are retouched.

A fragment of a *perforator* (Fig. 3: 13) was made probably of a blade from single platform core. Both edges of the tool are retouched.

In the group of *arrowheads* two types occur. The first one, with broken tip measures  $37 \times 32 \times 7$  mm. The base of the tool is symmetrically rounded and the ventral surface is covered by the cortex (Fig. 4: 4). The second one ( $51 \times 30 \times 6$  mm – Fig. 4: 5), bifacial, has a concave base and slightly chiselled tip.

Among the group of tools from the area of the pottery kilns is also a fragment of partially retouched cortical flake, and two fragments of partially retouched blades (Fig. 3: 3, 7).

### **Nodules**

The first nodule of raw material measures  $80 \times 48 \times 36$  mm, the second one is a fragment of a nodule, covered by a thin cortex.

Almost all artefacts were made of Volhynian flint. The exceptions were one nodule, one truncation, one endscraper and one retouched flake made of local flint plus one truncation made of quartzite.

## 1.2. Material from Ploschadka 1

In the excavations of Ploschadka 1, 77 flint and stone artefacts were discovered: 50 items of debitage, one core, 26 tools and one tool (hammerstone) related to production of lithic artefacts (Table 1).

There were nine items belonging to the group of finds related to core preparation, initial core trimming and early stage of core processing – one cortical flake made of local flint and eight trimming flakes (two broken), made of Volhynian flint. The smallest one measures  $27 \times 38 \times 10$  mm, and the largest one measures  $65 \times 44 \times 9$  mm. There are five smooth butts, one faceted one and two of undetermined type.

The group related to flake exploitation is rather large and consists of 15 items (six broken). The dimensions of the smallest one is  $27 \times 23 \times 5$  mm, and the largest one is  $52 \times 46 \times 10$  mm. Ten butts are smooth, one is dihedral and one is undetermined. Six of the flakes were made of Volhynian flint, three of local flint, three of sandstone and three were burnt.

The group related to blade exploitation contains 16 artefacts – one single platform core for blades and 15 blades from single platform cores. The core measures  $54 \times 57 \times 40$  mm. The platform is smooth, and the striking angle is  $80^\circ$ ; the back and bottom of the core is covered by the cortex (Fig. 2: 3). Within blades only two of them whole, measuring  $49 \times 20 \times 5$  mm and  $52 \times 25 \times 8$  mm. Among the fragments of blades three are proximal parts, four central and six distal. There are seven smooth butts and one of undetermined of type. Six blades are made of Volhynian flints, four of local flint, one of quartzite and four are burnt.

Table 1. Kamianets-Podilskyi (Tatarysky). List of artefacts

Technological groups (Schild <i>et al.</i> 1975)	Pottery kilns (Excavation Site I)	<i>Ploschadka</i> (Excavation Site II)
I – Core preparation, initial core trimming and early stage of core processing		
1. Cortex flakes	2	1
7. Trimming flakes	-	8
II – Exploitation of flakes		
2. Flakes from single platform cores	5	16
III – Exploitation of blades		
1. Single platform cores for blades	-	1
2. Blades from single platform cores	-	15
IV – Reparation		
1. Platform rejuvenation flake	-	1
V – Undetermined artefacts, waste from core exploitation and retouching		
2. Undetermined flakes	1	1
4. Chips	-	3
5. Chunks	1	5
VI – Tools and characteristic waste from tool production		
1. Tools made from blanks struck of by classic coring technique	<b>10</b>	<b>25</b>
endscrapers on flakes	2	
endscrapers on blades	-	3
truncations	2	2
perforators	1	1
arrowheads	2	-
partially retouched flakes	1	2
partially retouched blades	2	12
retouched blades	-	3
axes or stone shaft-hole axes	-	1
Undetermined tool		1
VII – Tools of lithic chipped production		
1. Hamerstones	-	1
VIII – Raw material		
1. Flint nodules	2	-
<b>Total</b>	<b>21</b>	<b>77</b>



Within the group of reparation, one platform rejuvenation flake was found, measuring  $43 \times 35 \times 11$  mm, made of local flint.

The group of undetermined artefacts, flaking and retouching wastes consists of nine artefacts: one undetermined flake made of local flint, three chips (two made of local flint and one burnt) and five chunks (two made of local flint and three burnt).

### **Tools**

The category of tools is the largest group found within the Ploschadka 1. In total, 26 artefacts were discovered.

### **Endscrapers**

The category of endscrapers contains three broken tools, made of rather large blades. The largest one measures  $(81) \times 34 \times 15$  mm (Fig. 2: 8) and the smallest one measures  $(46) \times 31 \times 6$  mm (Fig. 3: 5). All working edges are symmetrically rounded, high or medium high, and steep or semi-steep. In two cases, both edges of the endscrapers are retouched (Fig. 2: 8, 3: 8).

### **Truncations**

Within the assemblage of tools, two truncations occurred. The first one, measures  $43 \times 31 \times 9$  mm. The truncation is transverse and concave, made by abrupt retouch on the dorsal side of the tool (Fig. 4.3), resembling the scaled technique. The dimensions of the second one are  $46 \times 19 \times 6$  mm. Its truncation is transverse and oblique (Fig. 3: 11).

### **Perforators**

Only one, badly damaged, artefact was discovered.

### **Partially retouched flakes**

Two fragments of retouched flake were registered.

### **Partially retouched blades**

The group of partially retouched blades is the most numerous of the categories of tools and contains 12 items. Only one tool is whole and measures  $84 \times 25 \times 8$  mm (Fig. 2: 5). The other artefacts are broken. Within broken exemplars, five proximal parts (Fig. 2: 6, 9; 3: 2, 6), four central ones (Fig. 3: 4) and two distal ones (Fig. 2: 4) were registered. The blades were rather large and wide (retained dimensions some of them are  $(77) \times 27 \times 8$  mm,  $(78) \times 28 \times 12$  mm,  $82 \times 34 \times 7$  mm). Retouch occurs on fragments of right or left edges (sometimes on both of them) and is, in most cases, abrupt and invasive.

### **Retouched blades**

This category of tools contains three artefacts. The smallest one, measures  $66 \times 16 \times 5$  mm, and its edges were retouched by high and abrupt retouch (Fig. 3: 1). The dimensions of the second one are  $87 \times 19 \times 5$  mm. The left edge of the tool is retouched by trough-like retouch, and on the dorsal side traces of polishing are visible (Fig. 4: 1). The largest one measures  $92 \times 23 \times 8$  mm. All edges of the tool were retouched by quite massive retouch, apart from a fragment of the right edge, where the retouch was smaller. The ventral side of the artefact is covered by cortex (Fig. 4: 2).

### **Chopping tools**

The only example of an axe or a stone shaft-hole axe, made of sandstone, is broken (Fig. 2: 2).

### **Undetermined tools**

Only one undermined tool was registered (Fig. 3: 12).

### **Tools related to production of lithic artefacts**

In the assemblage one round hammerstone, measuring  $52 \times 52 \times 54$  mm, occurred. The artefact is burnt, and nearly the entire surface is covered by the cortex (Fig. 2: 1).

## 1.2.1. ANALYSIS OF THE FLINT MATERIAL

The assemblage of artefacts from the pottery kilns area is quite random due to the features being located on a steep slope and it cannot be ruled out that they got here as a result of post-depositional processes. Therefore, we limited our analysis of flint processing to a discussion of the material from Ploschadka 1, representing a rather homogeneous assemblage.

### 1.2.1.1. Raw material

The analyzed assemblage from Ploschadka 1 was made mostly from Volhynian flint (35 artefacts – c. 56% of the whole collection). The colour of the flint is dark grey or black. In the siliceous mass of several items, grey spots or bands are visible and some artefacts are covered by a thin white cortex. Nineteen artefacts were made from local flint (c. 25% of the whole collection), three from sandstone (c. 4% of the whole collection), two from quartzite (c. 3% of the whole collection), and 18 artefacts are burnt (some of them very heavily, as a result of which small fragments – chips – fell off the products). It is worth mentioning that 14 of the 25 flint tools were made of Volhynian flint, mainly long and wide retouched blades.

Only one core was recorded in the assemblage from Ploschadka 1, measuring  $54 \times 57 \times 40$  mm. However, taking into account the length of some retouched blades (87 and 92 mm) we assume that the cores may have been up to 15 cm long. Based on the presence of items from the group representing core preparation, initial core trimming and early stage of core processing that were made mostly from Volhynian flint (seven out of the nine items of this group), it is very likely that the raw material processing took place in the other parts of the site. However, obtaining blanks for tool-making from somewhere else cannot be completely ruled out. Certainly, the Volhynian raw material was used very rationally at this site, as evidenced by the re-using of some tools made from this raw material.

### 1.2.1.2. Knapping technique

Raw material processing at the site was based on classic tool reduction. No artefact was discovered that had been made by the splintering technique, viewed by some archeologists as evidence of absence of good quality of raw material (Deckers 1982).

Based on the presence of the core, and observation of the debitage and blanks for tools, we can assume that the classic core reduction technique was applied to single platform cores.

The lithic production at the site was focused both on flake and blade blanks; this is confirmed, on the one hand, by the presence of artefacts from the group of exploitation of flakes and some tools made on flakes and, on the other hand, by tools made mostly on blades.

Debitage was performed by application of the soft percussion technique, which may be assumed by the hammerstone found at the site and characteristic cylindrical “scars” (Pelegrin 2000, fig.3), present on the percussion bulbs of several artefacts.

### 1.2.1.3. Tool production

Within the analyzed collection were 26 tools, which is almost 34% of the assemblage from Ploschadka 1. The most numerous category of the tools are partially retouched and retouched blades (15 items). They are tools of rather considerable size, with a length exceeding in some cases 92 mm or 87 mm (the broken item). The lateral edges of this type of tool are shaped with continuous or partial retouch – abrupt and invasive. They were mainly used for scraping/cutting hide, soft material processing and cutting cereals (one case).

A less numerous group of tools is represented by endscrapes (three broken artefacts), made on blades and truncations (two artefacts), made on flakes. Among the other tools are: a perforator, a partially retouched flake, a fragment of an axe or a stone shaft-hole axe and an undetermined tool. Some of these tools display traces of use (see below).

## 2. USE-WEAR ANALYSES

Fifteen flint artefacts were selected for use-wear analyses. The collection included three specimens from the Excavation-Site I (endscraper, truncation and perforator) and 12 specimens from Ploschadka 1 (three endscrapers, a truncation, seven retouched blades and an undetermined tool fragment) (Table 2).

### 2.1. Methods

Microscopic observations were carried out at the Laboratory of Archaeometry and Archaeological Conservation, Institute of Archaeology, University of Wrocław, with the use of the standard optical microscopes: an Olympus SZX9 stereomicroscope ( $\times 6.3-114$ ) for

recording fractures and scars and a Nikon ECLIPSE LV100 metallographic microscope ( $\times 50-500$ ) for analysing polish. Prior to microscopic observations, the artefacts were cleaned in an ultrasonic tank (2 minutes bath in water).

## 2.2. Results

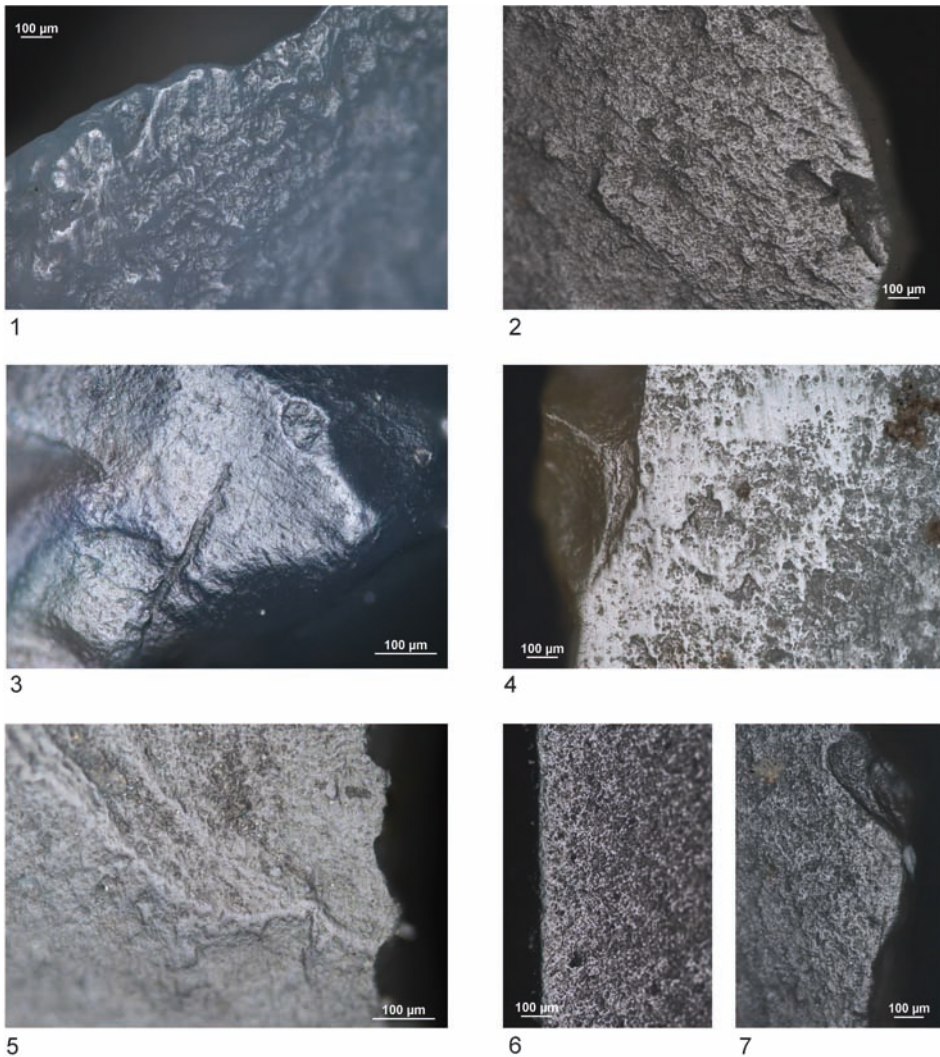
Traces of use were recorded on almost all of the analysed tools, beside one retouched blade. Most of the flint artefacts display polish from contact with soft materials: of animal (eight specimens), or vegetal origin (two specimens), and three where the nature of the material remains undetermined. Only one tool examined had been used for working hard materials.

Seven tools had been used for scraping hide (Fig. 2: 7-8; 3: 5-6, 10, 12-13). This group includes different types of retouched tools: three endscrapers, two truncations, a retouched blade and undetermined tool fragment (perforator or retouched blade). The working edges are also diverse: distal retouched (two), proximal retouched (one), lateral unretouched (two), lateral retouched (two) and edge of breakage (one). All working edges display well-developed hide-working traces. They are highly rounded, covered by greasy polish of cratered topography located on the very edge and one of the aspects near the edge. Polish is accompanied by infrequent filled-in striations and single black scratches (Fig. 5: 1-2). A retouched blade shows traces of mixed directionality, both perpendicular and parallel, resembling "polish 10", which suggests that this tool was used for a scraping and cutting activity. The group of hide-working tools complements a proximal fragment of perforator, with very well-developed traces located around the tip (Fig. 3: 14; 7: 3).

Traces of cutting cereals are recorded only on a single specimen, which is a completely preserved, long retouched blade (Fig. 4: 1). The artefact displays quite well-developed sickle gloss on the left lateral side covered by regular, laminar retouch. The edge is highly rounded. Reflected, bright polish is located along the whole edge, covering also the bulb. Traces run parallel to the main axis. Linear traces, such as striations are scarce, but depressions of different size, including comet-shaped pits are numerous. The retouch negatives are not completely filled with polish (Fig. 5: 4). Some accidental scars have removed portions of sickle gloss. The opposite side shows slight edge rounding and generic polish near the very edge, which are very common characteristics of hafting traces of long parallel Neolithic sickle inserts (*e.g.*, TRB, Baden culture).

Plant or wood polish is preserved on small portions of left and right edges of an endscraper (Fig. 3: 9). Due to subsequent edge retouch, use polish is intersected by negatives and the cutting edges are sharp. They are covered by fairly invasive, irregular bright polish of domed topography that shows clear directionality – parallel to the main axis (Fig. 5: 5). Other parts of lateral sides as well as retouched distal edge (the endscraper's cutting edge) do not show any traces of use.

Three long blades with all the edges covered by parallel retouch display continuous traces similar to each other (Fig. 3: 1-2; 4: 2). These are edge rounding and polish from contact with



**Fig. 5.** Kamianets-Podilskyi (Tatarysky).

Traces of use on flint tools: 1-2 – scraping hide; 3 – perforating hide; 4 – working plant or wood; 5 – cutting cereals; 6, 7 – traces on long retouched blades (Photo B. Kufel-Diakowska)

soft material, sometimes accompanied by tiny scratches of mixed directionality. In one case gloss is visible also on the dorsal ridge (Fig. 5: 6, 7). On the other example, hafting traces are preserved on the bulb part of a tool. Tools might have played the role of universal knives or daggers, kept in a sheath made from organic materials (see examples of the European Late Neolithic and Bronze Age: Wilk and Kufel-Diakowska 2016; Sudół-Procyk *et al.* 2017).

Table 2. Kamianets-Podilskyi (Tatarysky). Results of the use-wear analysis of selected flints

No.	Inv. No./ Excavation Site No.	Tool category	Preservation	Activity/ working material	Figure
1	1/I	truncation	complete	scraping/hide	
2	2/I	endscraper	complete	scraping ?/hide	
3	14/I	perforator	proximal part	piercing/hide	5:3
4	28/II	undetermined tools fragment	proximal part	scraping/hide	
5	48/II	retouched blade	distal part	contact/soft material	5:6
6	62/II	endscraper	distal part	scraping/hide	5:1
7	81/II	retouched blade	proximal part	no traces	
8	82/II	truncation	complete	scraping/hide	5:2
9	85/II	endscraper	complete	cutting/plant or wood	5:5
10	86/II	retouched blade	mesial part	scraping and cutting/ hide	
11	87/II	retouched blade	proximal part	undetermined/hard material	
12	89/II	retouched blade	complete	contact/soft material	
13	90/II	retouched blade	complete	contact/soft material	5:7
14	91/II	retouched blade	complete	cutting/cereals	5:4
15	93/II	endscraper	distal part	scraping/hide	

Traces of contact with a hard material were recorded on a fragment of retouched blade (Fig. 2: 6). The distal part and a portion of left lateral side of a blade were broken off. The right and preserved portion of a left cutting edge are abraded and thickened, with generic polish displayed on the very edge, as well as step, irregular scars on both aspects. The tool was used for undetermined transverse activity (or was deliberately damaged?).

Despite the small size of the analysed collection of flint tools, some remarks can be made based on the recorded traces of use. First of all, the tools displayed well-developed microtraces, which means that they mostly had a relatively long use-life. In the group of used tools, we can distinguish complete formal flint tools. They are retouched blades with traces of contact with soft materials or with traces of cutting cereals. These tools, which played a role as knives or daggers, or sickle inserts, were hafted and indented for long usage. There are also other formal hafted or hand-held tools: (complete?) endscrapers used for scraping hide and a fragment of perforator. Apart from tools produced for an intended function, there are also smaller truncations and fragments of retouched tools. Probably some of them could have been recycled fragments of re-used long retouched blades (deliberately broken?). The production of long blades as the main products of Trypillia BII flint knapping is confirmed at the Bodaky site with lithic workshops (Skakun



*et al.* 2018). In the case of the smaller specimens from Kamianets-Podilskyi (Tatarysky), the traces of use are located on random edges (bulb edge, edge of breakage). They also represent different types of retouch which is not as regular and invasive as in case of the complete specimens. This meant that there is rather a weak relationship between the type of a tool and its function, because flint blades were recycled, modified into other forms. This is well documented by a group of tools used for scraping hide.

### 3. DISCUSSION

A comparison of the flint production at the Kamianets-Podilskyi (Tatarysky) settlement with other known assemblages from Trypillia BII sites is difficult because of the regional differences and various function of features, from which the flint artefacts come (Pichkur 2019; Pichkur and Shidlovskiy 2005).

At the Nebelivka megasite (Fig. 1), contemporary with our site, only c. 150 lithic artefacts were found within the surface of the excavated area, houses, mega-structure, test-pits and large pit in the Sondazh 1, made from Volhynian flint (almost half of the lithics), or deriving from local procurement probably in Korobchyno quarry and rock crystal. However, the authors noted two modes of flint processing. The first one, based on local flint or chert, focuses on satisfying the immediate need of the members of the house, and the other one, based on imported Volhynian flint, is used for preparing blades by flint-knapping experts (Kiosak *et al.* 2020, 352-367). Almost a half of the assemblage contains retouched items, which is very characteristic for Trypillia BII-C sites (Sorokin 1991). The typical tools of the Nebelivka megasite contain retouched blades, mainly medial parts with semi-abrupt retouches along with a single or both edges; some of them served as knives or perforators. There are also a few projectile points (Kiosak *et al.* 2020, 366).

Andriyivka is the other site dated to stage BII, slightly earlier than Nebelivka (Diachenko *et al.* 2020; Ryzhov 2015), where 181 flint items were found (Fig. 1). Within this assemblage, two cores, 30 items of debitage and as many as 141 tools occurred. The most numerous category of the tool is again retouched blades (38 items), mainly knife-shaped ones with regular or partial retouch. The next largest group of tools are endscrapers (30 items), made on flakes and blades, and scraping tools (four items) The following are: retouched flakes (23 items), notched scrapers (22 items), sickle inserts (18 items), perforators (three items), cutting tools (three items), chisel-like tools (two items), polished axe and arrowheads (two points). Almost all flint artefacts were made of local raw material, procured in the Velyka Vys river basin but there also some tools made of good quality flint of Turonian age, close to the Volhynian one (Pichkur 2012). However, the latter kind of flint was available locally, near Korobchyno village, in the area of the Velyka Vys river, where complexes of flint extraction are evident (Tsvek and Movchan 1997). The second category of raw material was used to make retouched blades. According to the author, this fact might indicate

the need to review the hypothesis, concerning the presence of Volhynian flint in this region (Pichkur 2012).

A similar assemblage to Andriyivka, in terms of raw material and range of tools, was found during surveys at the Volodymyrivka site (Fig. 1). Among 121 items, made mostly of local raw material from the banks of the Syniukha River and sporadically of Volhynian flint, 65 tools occurred. The group of tools contains retouched blades (14 items) and flakes (21 items), endscrapers (four items), perforators (four items), sickle insets (three items), arrowheads and others in less quantity (Hofmann *et al.* 2019).

From the area of the Middle Buh, the site Voroshylivka is worth mentioning (Fig. 1). Next to the Ploschadka 4, a flint workshop was located (Gusev 1995, Fig. 45). Most of 568 artefacts were made of Volhynian and “Upper Dniester” flint (in the author’s terminology). Tools, made both on flakes and blades, are characterized by abrupt retouch. The most frequent groups of tools are endscrapers and retouched blades. Burins, borers, perforators and arrowheads also occurred, however in smaller quantities (Gusev 1995, 172-187).

The only known Trypillia settlement, specialized in flint extraction and located in Volhynia area is Bodaky (Fig. 1). Activities there ranged from the production of semi-fabricates to the manufacturing of large finished blades and tools. Those products were then distributed over different Trypillia areas and territory of neighboring cultural units (Skakun 2005; Skakun *et al.* 2018). Bodaky is considered to be a settlement that is synchronous (Diachenko and Sobkowiak-Tabaka 2021) or slightly earlier (Tkachuk 2019) than Kamianets-Podilskyi (Tatarysky).

Moving on to the western Podillia region, three settlements with flint assemblages, related to the Trypillia BII, are known. In the case of the first one, Vertebea, due to the 19<sup>th</sup> century date of the site’s investigation, and its collector’s character (as well as later Western Trypillia layers there), we cannot analyze this inventory in a detailed way. However, it is worth highlighting the specific features of the flint processing of Middle Trypillia such as a large amount of retouched blades (including those with trough-like retouch) in the category of tools, endscrapers of blades, perforators and truncations (Kadrow *et al.* 2003, 101).

At the Viktoriv I site (Fig. 1), from the area of the remains of houses (268m<sup>2</sup>), were retrieved c. 3500 stone artefacts, made of Volhynian flint (the Podillia variety of Turonian flint according to Konoplja 1998). The assemblage consist of 17 cores, c. 1800 items of debitage and a large amount of tools, including retouched flakes and blades, saws, endscrapers, scrapers, burins, perforators, arrowheads and grinding stones (Konoplja 2005).

The last settlement from this region is called Cherniatyn quarry (Fig. 1). From the house and the trench, 415 flint artefacts were registered, made of Volhynian flint (the Podillia variation of Turonian flint according to Konoplja 1998). Within the assemblage were seven quite large cores, 221 flakes and 32 blades, and tool such as 63 retouched blades, 26 endscrapers, 12 burins, four perforators, two borers, three truncations, 14 notches, five axes and others (Konoplja 2015, 388-399).



## 4. CONCLUSIONS

Based on the short characteristic of a few flint assemblages from the sites, related to the Middle Trypillia in the area of forest-steppe Ukraine, we can assume that flint processing focused on the production of blades intended subsequently for the making of tools. The dominant types of tools were retouched blades (sometimes partially retouched), endscrapers and perforators.

Preferences in the use of raw material changed, depending on the region and the site. On many of these sites, local, non-Volhynian raw material predominated, with tools, mainly retouched blades, being made from better quality raw materials – local or imported Volhynian flint. Exceptions are represented by Bodaky, a number of Podillian sites and settlements in Volhynia (Pichkur and Shidlovskiy 2005).

The territory encompassing Volhynian flint outcrops, with the exception of Eastern Volhynia, was settled by the populations of the Malice culture during the time period of our interest (Kadrow 2013; Kadrow and Zakościelna 2000). It is worth highlighting that a fragment of a kitchen vessel found near the kilns at Tatarysky, was produced using WTC pottery-making techniques, but with ornamentation influenced by Malice traditions (Diachenko and Sobkowiak-Tabaka 2021). A few other sherds representative of Malice influences are known from surface collections at the site (Levinzon 2018; 2019). In this context, we must mention that also the ceramic assemblage of Bodaky displays strong influences from the Malice culture (Skakun and Starkova 2003; Tkachuk 2008) fitting a broader context of mutual influences between Malice, Lublin-Volhynian and Trypillia pottery styles (*e.g.*, Kadrow 2013; Starkova and Zakościelna 2018; Zakościelna 2010). Taking into account these influences, we assume the import of Turonian age flint from Southern Volhynia to Kamianets-Podilskiy (Tatarysky). It is also likely that influences in ceramic styles were disseminated throughout the WTC along with the spread of semi-fabricates and tools made of Volhynian flint.

The assemblage of finds from Ploschadka 1 in Kamianets-Podilskiy (Tatarysky) does not include any single spindle whorl, while a collection of spindle whorls comes from multiple surveys at this site (Levinzon 2018; 2019). At first glance, this fact finds a correlation with the results of use-ware analysis indicating leather and skin processing as a predominant function of artefacts, and might suggest a certain economic specialization of the inhabitants of this house. However, tools related to farming would not be necessarily deposited within a settlement, and especially within a house. In case of access to raw material, such tools would rather remain in the fields after being broken (Zbenovich 1989). It is worth mentioning that two artefacts with traces of so called sickle gloss were registered within surveys in the 1990s and 2000s (Radomskiy *et al.* 2021).

Also, as pointed out by Nikolova and Pashkevych (2003), ethnographic evidence from Caucasus, Middle Asia and the mountains of South-Eastern Asia suggests that hulled wheat, which was mostly grown by Trypillia populations, is cultivated and harvested using

wooden tools. The latter are still used in Georgia and known as “shamkvi”, “shankvi” or “shnakvi”. Therefore, the results of the analysis of tools assemblages most probably underestimate the proportion of agriculture in Tripolye economies in general (Pashkevych, Videiko 2006), and activities of the House 1 inhabitants in Kamianets-Podilskiy (Tatarysky) in particular.

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