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FLINT PRODUCTS FROM A GLOBULAR AMPHORA CULTURE GRAVE IN STEFANKOWICE-KOLONIA, HRUBIESZÓW DISTRICT, SITE 33 IN THE LIGHT OF THE LATEST CONSIDERATIONS

ABSTRACT

Mączyński P. 2022. Flint products from a Globular Amphora culture grave in Stefankowice-Kolonia, Hrubieszów District, site 33 in the light of the latest considerations. *Sprawozdania Archeologiczne* 74/1, 441-457.

The aim of this article is to present further considerations on the technological and functional aspects of flint tools produced by the community of the Globular Amphora culture. These reflections are based on discoveries made in a cist grave from site 33 in Stefankowice-Kolonia (southeastern Poland). During the exploration of the funerary feature, a skeleton was found. It belonged to a man in the Maturus age. The body was accompanied by an abundant set of flint products composed of five blades and three axes (including one half-product). These artefacts were subjected to a technological analysis aimed at determining the techniques employed in the production of the blades and core tools. The analysis was complemented with microscopic examination performed in order to determine the functions of the discovered items.

Keywords: Globular Amphora culture, flint blade, axes, use-wear analysis, technology
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INTRODUCTION

Artefacts made of siliceous rocks represent a group of grave goods frequently found in the materials of the Globular Amphora culture (hereinafter referred to as the GAC). Due to their unique character, they have been presented in numerous publications whose authors discuss their typologies as well as their technological aspects (Michniak and Budziszewski 1986, 214; Borkowski and Migal 1996; Migal and Sałaciński 1996; Sałaciński and Migal 1997; Migal 2006; Budziszewski and Grużdź 2013). Also the functions of such flint artefacts have been discussed many times in archaeological literature. Materials from settlements as well as those from funerary features have been microscopically examined. Unfortunately, despite the relatively large number of such publications, they usually represent analyses performed on small collections (Pyżewicz 2013; Osipowicz *et al.* 2014; Pyżewicz *et al.* 2016; Winiarska-Kabacińska 2017a; 2017b; Mączyński 2018; Boroń and Winiarska-Kabacińska 2021). No attempt to present a summary paper has been made so far. The study of flint materials found in the grave from site 33 in Stefankowice-Kolonia should be considered as a contribution to the debate on the production and importance of flint tools in the society known as the GAC.

LOCATION OF THE SITE AND BURIAL

Site 33 from Stefankowice-Kolonia is located on the loess hills of the Horodło Ridge (Solon *et al.* 2018). A place near the edge of the gentle S-E slope of a small watercourse was chosen for the burial (Fig. 1).

The site was discovered in 1986, during autumn works conducted in a field belonging to J. Baraniuk. Shallowly buried boulders were discovered when ploughing the field. Removing one of them resulted in revealing the burial chamber. Subsequent field research did not lead to discovering other features.

The body was laid in an oval stone cist, of dimensions 2.0 × 1.4 m and oriented E-W. It was buried 30 cm below the present ground level. Over ten granite blocks of different sizes were used in the construction of its side walls. They were additionally sealed from the outside with smaller cobbles. The whole structure was covered with two large erratic blocks. As in the case of the walls, they were also packed around with smaller stones (Fig. 2).

The individual buried inside was a man of about 40 years old (*Maturus* age). He was buried laid on the right side, with strongly flexed legs and his head pointing to the east. A rich set of grave gifts was found near the body. Unfortunately, we do not know the precise original locations of particular flints accompanying the body. Near the skull, there was a flint axe. Some other artefacts – two axes, four flint blades and a bone chisel – were discovered behind his back. The last flint object – a bladelet – was accompanied by three fragments of bone adornments (T-shaped pendants) found among the chest bones. An-

other ornament – a circular amber plate – was located below the upper epiphysis of the left tibia. There were also two vessels deposited in the grave, behind the head of the buried man (Ścibior *et al.* 1991, 84-86; Bronicki 2016b, 190-195).

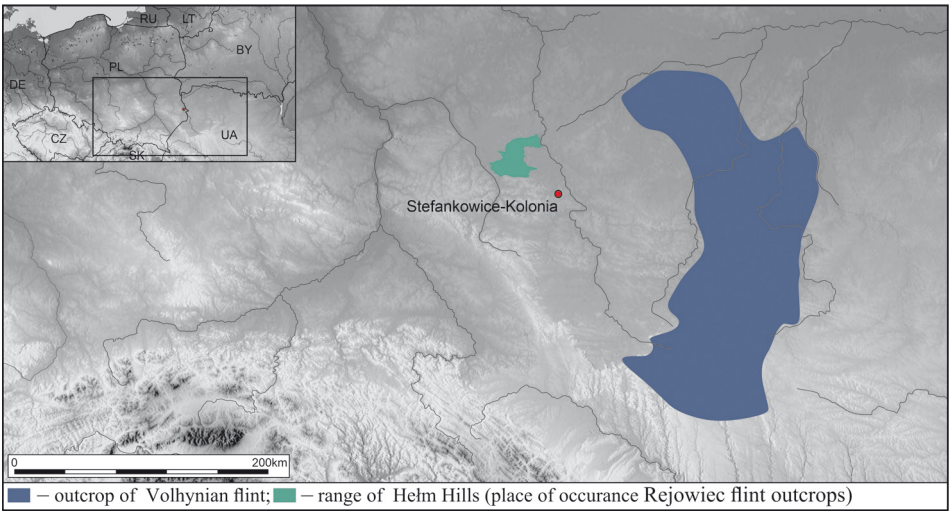

Fig. 1. Location of Stefankowice-Kolonia, Hrubieszów District, site 33, and outcrops of Rejowiec flint and Volhynian flint (after Petrougne 1995, fig. 1; Libera *et al.* 2014; base map: https://maps-for-free.com).
Prepared by P. Mączyński

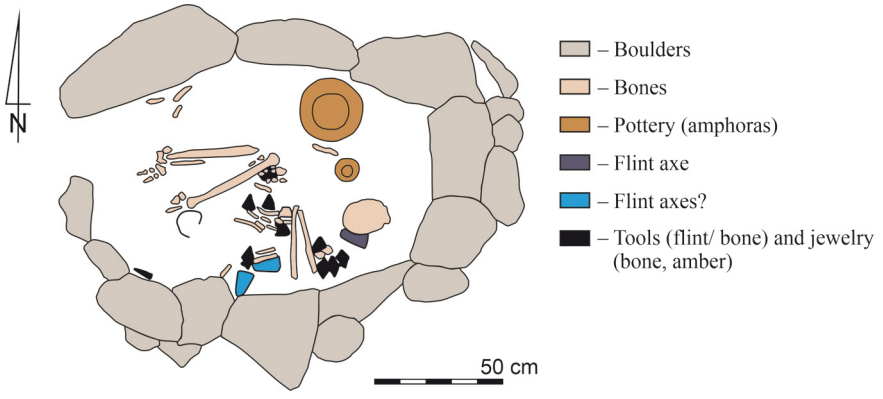

Fig. 2. Stefankowice-Kolonia, Hrubieszów District, site 33.
Plan of the Globular Amphora culture grave.
Prepared by P. Mączyński, after Ścibior *et al.* 1991

REVIEW OF THE MATERIALS

1. Partial secondary crested blade having an irregular outline. Cortical surfaces preserved only on a fragment of the right side. Irregular lateral edges; profile curved in the mesial part. Faceted butt, moderately prominent bulb with a scar; dimensions: 66 × 14 × 5 mm; weight: 4.5 g. Raw material: Cretaceous flint (Fig. 4: 1).

2. Blade with negative scars on the dorsal surface; triangular cross-section. Lateral edges parallel in places; profile curved in the mesial part. Butt bearing negative scars; platform edge slightly trimmed; prominent bulb with a visible scar; dimensions: 73 × 12 × 3 mm; weight: 2.7 g. Raw material: Cretaceous flint (Fig. 4: 2).

3. Blade; trapezoidal cross-section; cortical surfaces preserved only on the distal end. Irregular lateral edges, profile curved in the mesial part. Faceted butt; platform edge slightly trimmed; prominent bulb with a visible scar; dimensions: 70 × 17 × 4 mm; height of the bend: 4 mm; weight: 5.9 g. Raw material: Cretaceous flint (Fig. 4: 3).

Fig. 3. Stefankowice-Kolonia, Hrubieszów District, site 33. 1 – flint axe half-product; 2, 3 – flint axes. Photo by P. Mączyński

4. Chunky blade; trapezoidal cross-section; cortical surfaces preserved only on a small section of the right side. Irregular lateral edges; profile curved in the mesial part. Faceted butt; platform edge slightly trimmed; prominent bulb with a visible scar; dimensions: 48 × 20 × 4 mm; weight: 3.3 g. Raw material: Cretaceous flint (Fig. 4: 4).

5. Blade with negative scars on the dorsal surface; triangular-trapezoidal cross section; with the broken distal part. Edges parallel on the whole length; straight in the profile. Butt bearing a single negative scar; moderately prominent bulb with a visible scar; scars of

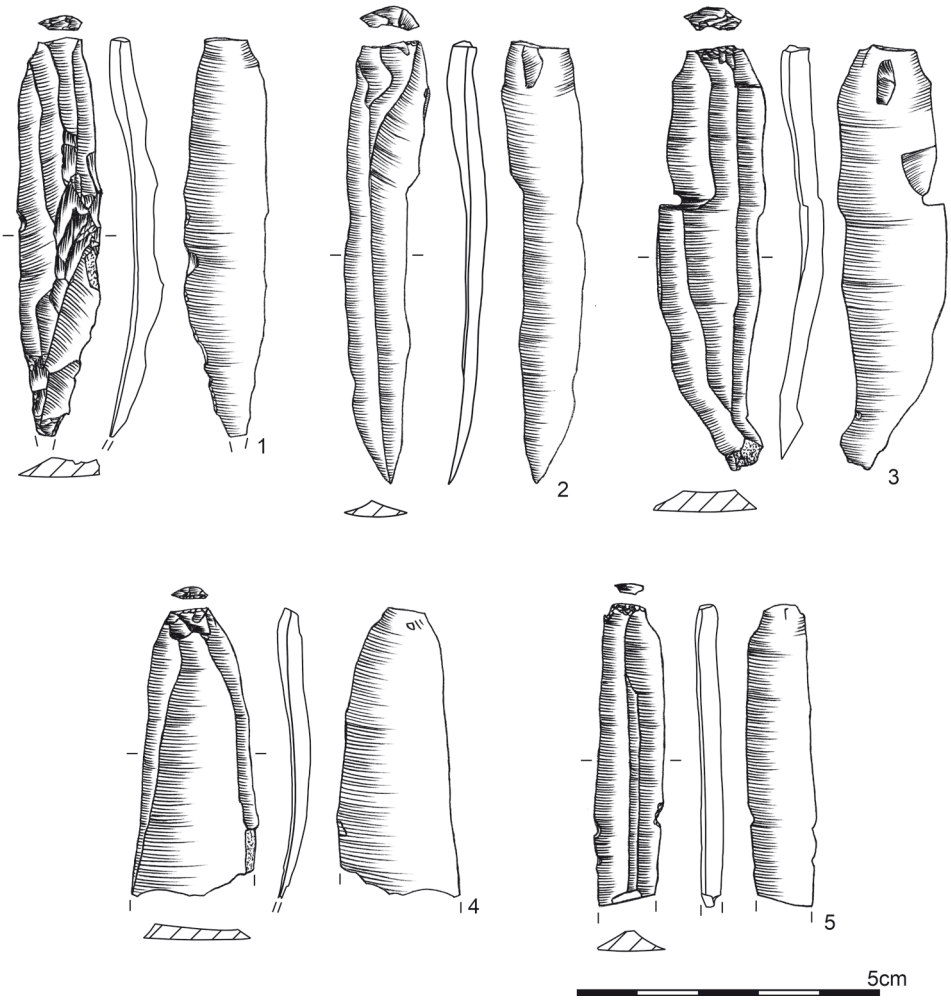

Fig. 4. Stefankowice-Kolonia, Hrubieszów District, site 33. Flint blades.
Drawing by P. Mączyński

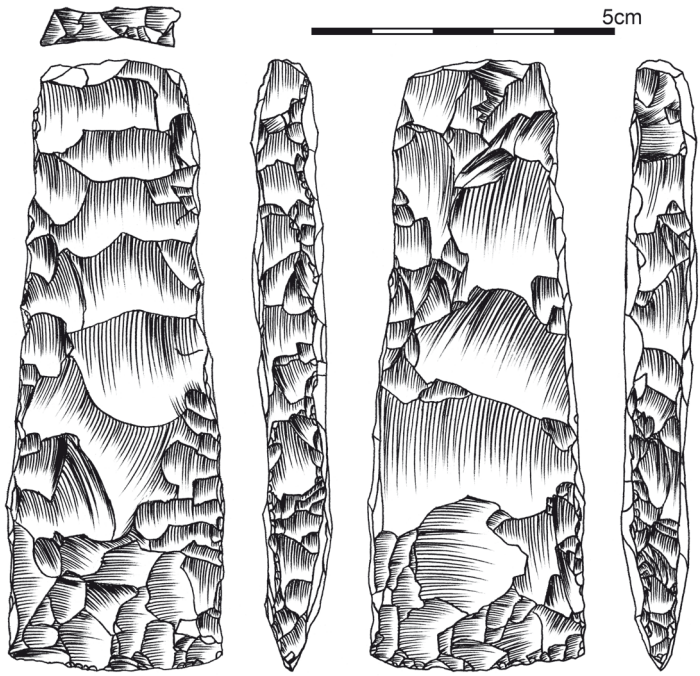

Fig. 5. Stefankowice-Kolonia, Hrubieszów District, site 33.
Four-edged axe half-product. Drawing by P. Mączyński

platform edge trimming; dimensions: 50 × 11 × 4 mm; weight: 2.4 g. Raw material: Cretaceous flint (Fig. 4: 5).

6. Axe half-product, trapezoidal in the face view; no surfaces processed by abrasion; chisel-shaped in the longitudinal section; almost rectangular in the cross-section; slightly arched cutting edge; almost rectangular butt. Height-thickness ratio: 8/1. Dimensions: 104 × 37 × 12 mm; weight: 71 g. Raw material: Cretaceous flint (Fig. 3: 1; 5).

7. Axe; trapezoidal in the face view. Processed by abrasion on *ca*. 70-80% of the surface; chisel-shaped in the longitudinal section; in the cross-section resembling a rectangle with strongly convex sides; slightly arched cutting edge with visible damage; rectangular butt, not polished. Height-thickness ratio: 6/1. Dimensions: 120 × 52 × 22 mm; weight 205 mm. Raw material: Cretaceous flint (Figs 3: 2; 6:1).

8. Axe; trapezoidal in the face view. Processed by abrasion on *ca*. 90% of the surface; chisel-shaped in the longitudinal section; in the cross-section resembling a rectangle with slightly convex sides; slightly arched cutting edge; almost rectangular butt, not polished. Height-thickness ratio: 9/1. Dimensions: 78 × 28 × 8 mm; weight 23 g. Raw material: Cretaceous flint (Figs 3: 3; 7: 1).

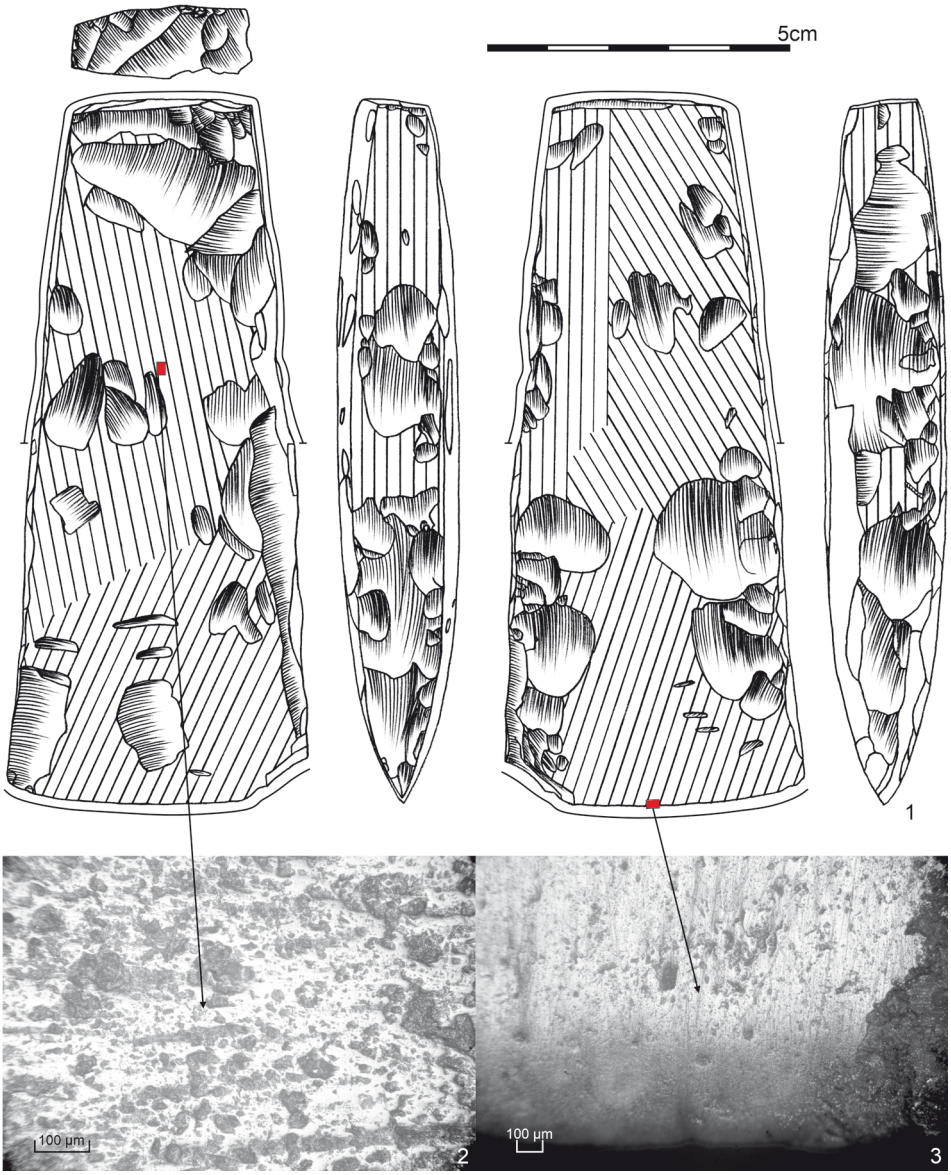

Fig. 6. Stefankowice-Kolonia, Hrubieszów District, site 33.
1 – four-edged axe; 2 – traces of sharpening; 3 – hafting traces.
Drawing and photo by P. Mączyński

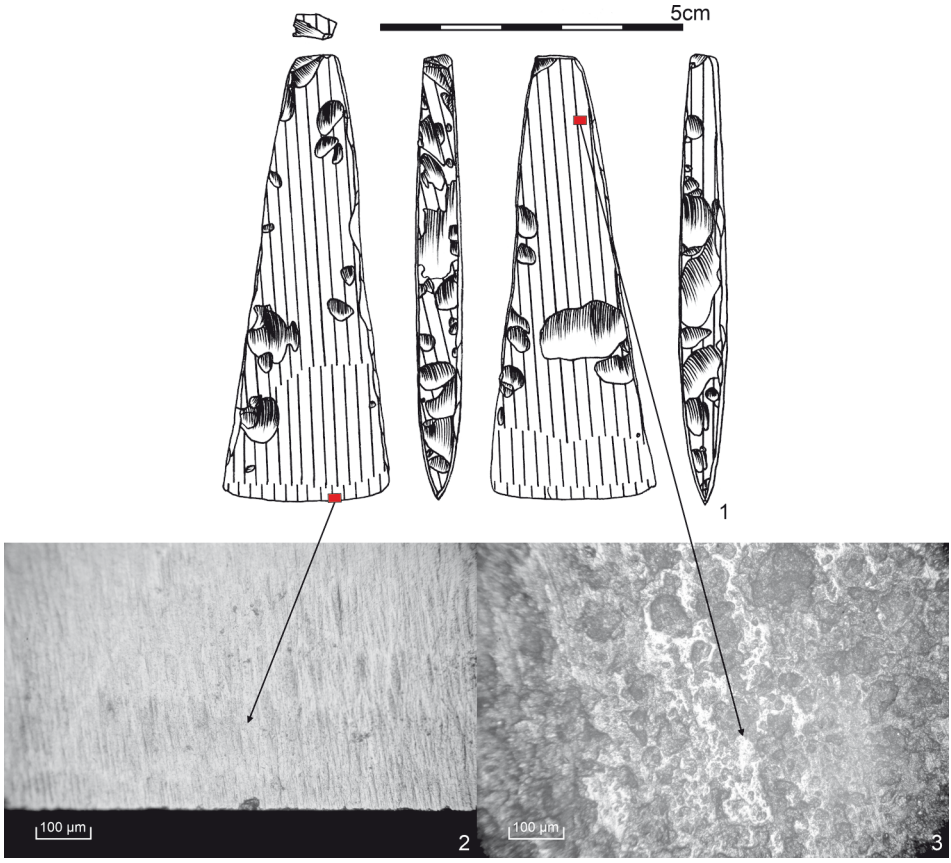

Fig. 7. Stefankowice-Kolonia, Hrubieszów District, site 33.
1 – four-edged axe; 2 – hafting traces; 3 – use-wear traces – wood working.
Drawing and photo by P. Mączyński

METHODS

Examination for identifying use-wear patterns was conducted with the use of two types of microscopes. At the first stage of the research, a stereoscopic Carl Zeiss Discovery v8 microscope – allowing magnifications from 10× to 80× – was employed. When performing this analysis, magnifications of up to 50× were used. The next phase consisted of observing the surfaces of the analysed artefacts under a metallographic Meiji Techno MC-50T microscope, which allowed us to obtain the actual magnifications of 50×/100×/200×/500×. In this case, magnifications of up to 200x were used.

The research of the technology employed in the production of the blades and axes was mainly based on the observation of their general morphologies. The microscopes were

used only occasionally. They were used to observe the butts of the blades. This procedure sometimes proves useful when identifying raw materials used in the production of hammerstones or punches that came in contact with stone surfaces. On the other hand, during the analysis of the axes the microscopes were employed to observe their surfaces processed by abrasion in order to distinguish different cut types.

The types of flints used in the production of particular tools were determined with the use of macroscopic methods that take into account their colours, structures and presence or absence of inclusions.

RAW MATERIAL ANALYSIS

Before presenting the flint artefacts deposited in the grave, it is necessary to discuss the provenance of the raw materials used in their production. The colours of the blades are rather diverse. Generally speaking, they were made of dark navy blue or grey flint with many turbidities and brighter discolorations (Fig. 3).

The axe (half-product) that was not processed by abrasion was made of a matt flint concretion (Fig. 3: 1; 5). On its upper face, it has a creamy grey colour with slightly brighter discolorations. In the middle part, the colour of the raw material is completely different (dark grey turning into brown). Also the second specimen is two-coloured. It is black-and-grey near the cutting edge and butt, whereas the middle part of the artefact is ash-grey with visible darker discolorations (Figs 3: 3; 7: 1). The third axe was made of ash-grey flint having a heterogeneous colour (Figs 3: 2; 6: 1).

It is particularly difficult to determine without any doubt the provenance of the raw material used, which is caused by the fact that different flint varieties – whose colours resemble those of the artefacts discovered in the grave from Stefankowice-Kolonia – were located within the range of the distribution of GAC materials. About 40 km to the north-east, in the Chełm Hills, there are the outcrops of Rejowiec flint in post-glacial deposits formed during the Riss glaciation (Rejniewicz 1985, 10, 13; Libera *et al.* 2014, 60; 2016, 154-155; see also Bronicki 2016a). On the other hand, the colours of the discussed artefacts – especially of the axes – are similar to those of raw materials (Volhynian flint) occurring in the Volhynian-Podolian Upland, which are located about 100 km from the site in question (Petrougne 1995, fig. 1; *cf.* Zakościelna 1996, 16). It is worth mentioning that the author of the previous paper consecrated to this funerary collection, A. Bronicki, mentioned that all the axes and four blades were made of Volhynian flint (Fig. 4: 1, 3-5). On the other hand, the last blade (Fig. 4: 2) was described as made of Transnistrian flint (2016b, 195).

Due to these uncertainties and insufficient degree of knowledge of the various varieties of the raw materials from the Volhynian-Podolian Upland, the question of the provenance of the materials used in the production of the reviewed artefacts remains unanswered.

MORPHOLOGICAL AND TECHNOLOGICAL ANALYSIS OF THE BLADES

The question of determining the methods employed during the production of flint artefacts has been tackled many times in the archaeological literature (Inizan *et al.* 1999, 78, 79; Sørensen 2006). Some of these papers discussed specifically GAC materials (Migal and Sałaciński 1996; Budziszewski and Gróżdź 2013, 167, 168). It is usually difficult to reconstruct techniques used in core exploitation destined to produce blades, thus such attempts are often not very accurate. This results from the fact that debitage morphologies are caused by different factors. The most important of them include the type of flint used, the shape of the processed core and its orientation. The manual dexterity and skills of knappers as well as the shapes and sizes of tools used by them should be also taken into account. All these variables mean that blades produced with the use of different methods can have similar technological and stylistic features (Budziszewski and Gróżdź 2013; Grużdź 2017, 150).

The discussed set consists of five blades and three flint axes (includes one half-product). Although the blades are slightly more numerous than the axes, their joint mass is much smaller and amounts to less than 19 g. The axes weigh together as much as 300 g.

Although attempts at refitting (see: Tomaszewski 1986, 240, 241) were made in order to obtain further information, it was found that these forms cannot be refitted, although the colours of several items indicate that they were struck from the same nodule. The microscopic observation of the blade butts did not result in distinguishing traces that would indicate the type of raw material used in the production of the tools employed in detaching the blades. An attempt to identify the technique employed in the core exploitation was based on the general character of the blade morphologies. Three specimens are relatively thin and slender, with a curve in the mesial part (Fig. 4: 1-3). What is more, their lateral edges and ridges are irregular. These features indicate that indirect percussion was employed in their production. The same technique was probably used to detach another blade – which was by contrast chunky (Fig. 4: 4).

Several morphological features distinguish the last of the artefacts (Fig. 4: 5) from the previously-described forms. This blade has straight and parallel lateral edges and ridges. Its profile is straight. These features indicate that it was detached with the use of the pressure technique (*cf.* Sørensen 2006, fig. 5).

The above-presented observations indicate that the blades deposited in the grave were produced with the use of several methods. Still, we need to bear in mind that an expert knapper having access to good quality material was able to employ the direct percussion technique in order to produce blades with straight edges. The weak point of the presented analysis is the size of the collection. Examining a larger group of artefacts having similar features would certainly increase the value of the obtained results.

MORPHOLOGICAL AND TECHNOLOGICAL ANALYSIS OF THE FLINT AXES

The production of tetrahedral axes made of striped flint has been discussed several times in the archaeological literature. Stress was put on researching the methods of flaking them into shape and polishing (Borkowski and Migal 1996; Migal and Sałaciński 1996; Sałaciński and Migal 1997; Budziszewski and Grużdź 2013). Usually, archaeologists distinguish several production stages – like choosing adequate raw material, testing it and chipping the artefacts into desired shape. In the first stages, artisans probably employed the hard hammerstone technique. The methods of indirect percussion and pressure were used only at the end of the production process in order to process flint with greater precision (Budziszewski and Grużdź 2013, 170).

The set of axes from Stefankowice-Kolonia includes one specimen that was not processed by abrasion, which gives us deeper insight into the methods of shaping the surfaces of core tools. This artefact was made with precision and is probably a product shaped by knapping. On the axe, there are negative scars associated with two phases of flint processing. The initial scars were formed when giving it an overall shape. These are vast scars whose arrangement indicates that both faces and sides were formed with blows directed towards the centre. In many cases, they go across the entire width of the sides. Surfaces located by the cutting edge are an exception here, because they were shaped with blows from the front. Most probably, indirect percussion was employed during this phase of flint processing. The last stage of knapping the axe into shape consisted in forming minute negative scars correcting the side margins and the cutting edge. They are visible only in certain sections. Here, the knapper might have used both the indirect percussion and pressure techniques (*cf.* Budziszewski and Grużdź 2013, 170).

The last stage of every axe production was processing it by abrasion, which gave such artefacts their final shape. Two methods were employed then. An axe might have been processed when held directly in the hand or in a specially made device. The latter considerably accelerated the process. Using each of the two methods results in leaving different types of traces, thus it is possible to identify to a certain extent the techniques employed (Madsen 1984; Pyżewicz *et al.* 2016, 311, 312). Still, we need to bear in mind that the entire process of abrading an axe might have consisted of several phases involving processing it in the hand as well as with the use of a special device.

Usually, traces present on processed surfaces make it possible to determine the relative granulometry of the abrasive plate used as well as the direction of abrading and – as mentioned before – the technique employed.

In the description of the surfaces processed by abrasion, it was decided to use the division presented by W. Borkowski and W. Migal (1996), who – based on microscopic observations – defined three categories of axe surfaces formed with the use of different methods:

Grinding – smooth surfaces accompanied by straight scratches, which appear to be white against dark background;

Polishing (fine grinding) – smooth surfaces without thick scratches - sometimes their fragments are visible; at times, there are fine and thin scratches having a different character; such surfaces are usually glossed;

Edge sharpening – smooth, shiny surfaces without scratches (Borkowski and Migal 1996, 48).

Such activities were performed on both abraded axes. In the case of the larger specimen (Figs 3: 2; 6: 1, 3), it was impossible to observe the lower face (near the cutting edge) due to very distinct use-wear patterns that had completely blurred the traces of processing by abrasion. On the other hand, the state of processing recorded on the upper face and on the sides allowed us to include it in the first category. There are also polished surfaces in certain places. What is interesting is that the scratches formed on the axe indicate that it was abraded at different angles, which probably means that they were created during processing the artefact when held in hand.

The whole surface of the other axe was observed (Figs 3: 3; 7: 1, 2), as it lacks use-wear patterns on its cutting edge. On the upper face, there are traces of grinding which give way – gradually and towards the cutting edge – to patterns left by polishing. Near and on the cutting edge, there are marks of sharpening. As in the previous case, the character of the surface indicates that the artefact was processed by abrasion without the use of a special device.

RESULTS OF THE FUNCTIONAL OBSERVATION

All the artefacts were subjected to microscopic examination. The analyses conducted on the blades indicated that their edges are not covered with use-wear patterns (Fig. 4). What is interesting is that the edges are very well preserved. Only in some sections is there micro-retouch, which should be interpreted as incidental and undesired damage. Due to the absence of use-wear patterns, as well as to the very good general state of preservation of the edges, it is worth considering whether these artefacts were specially made to be deposited in the grave.

More interesting are the results of the analyses conducted on the flint axes. The first specimen – not processed by abrasion - is not covered with use-wear patterns, which confirms the assumption that this is an unfinished artefact (Fig. 5). On the other two axes, there are traces indicating that they served as tools.

The larger specimen (Fig. 6: 1) has a pale bright gloss with a dome-crater topography near the cutting edge (Fig. 6: 3). This pattern is accompanied by bright scratches arranged perpendicular to the cutting edge, which are interpreted as a result of processing soft wood.

What is more, traces in the form of a bright gloss – having a dome topography – are present in some places of the upper face of the tool. They indicate that the axe was hafted

in a wooden handle (Fig. 6: 2). Most probably, these parts were more susceptible to abrasion from the handle when the axe was used.

The use-wear patterns on the second specimen are much less distinct (Fig. 7: 1). On the upper face, there is a bright gloss having a dome topography (Fig. 7: 3) which should be interpreted as indicating the use of hafting (?). What is important is that the cutting edge of the axe is not covered with use-wear patterns, thus it appears that it was sharpened by abrading anew the part located near the edge (Fig. 7: 2). It is possible that this activity was performed shortly before depositing the artefact in the grave, which might be indicated by the lack of damage on the cutting edge (minute negative scars or chipping).

DISCUSSION

It is worth considering what can be said about the discussed collection in regard to other GAC assemblages. We should also think about the character of the flint artefacts deposited in other graves. Unfortunately, there is only a modest body of information from Polish territories. Blade tools have been relatively seldom analysed. Among materials discovered at sepulchral sites, the most abundant are those from site 3 in Koszyce, Proszowice District. A total of 39 flint blades and seven core forms – found during the exploration of a collective grave discovered at this site – were subjected to an analysis. According to K. Pyżewicz – the author of the research – the group of blades included ten specimens covered with use-wear patterns. The activities performed with these artefacts include cutting plants, dismembering animal carcases and hide processing (Pyżewicz 2013, 180-182). In this context, we should mention a retouched blade discovered in a monumental grave from Kierzkowo, Żnin District. Its unretouched side was also used as a sickle insert (Winiarska-Kabacińska 2017b, 174, Fig. 1: b).

Flint axes have been much less frequently subjected to functional analyses. Besides the mentioned site in Koszyce, such artefacts come from the following sites: Kowal, Włocławek District, site 14; Ludwinowo, Włocławek District, site 3; Puławy-Włostowice, Puławy District, site 3; Żelice, Wągrowiec District; Wągrowiec, Wągrowiec District (Osipowicz *et al.* 2014, 97; Pyżewicz *et al.* 2016, 331, 332; Winiarska-Kabacińska 2017a, 564; Mączyński 2018, 350). There is a total of sixteen flint axes from the above-listed sites that have been subjected to analyses aimed at determining their functions. These artefacts can be divided into several groups:

– items with traces created when performing certain activities – usually wood working;
– items with use-wear patterns in the form of traces left by hafting;
– items without traces left by hafting or performing activities.

In the analysed material, tools without traces left by work are prevalent. It is possible that at least in some cases their edges were processed by abrasion again before they were deposited in graves.

To sum up the results of the analyses conducted on the funerary materials from the above-mentioned sites, we can state that the custom of endowing buried people with sets of full value artefacts, not damaged by prolonged use was followed by the GAC community. These are half-products, semi-raw materials and functional tools that had been used to a minimal extent or were not used at all.

CONCLUSION

The obtained results of the functional analyses indicate that people burying the man in the grave from Stefankowice-Kolonia endowed him with a set of practically unused flint tools without use-wear traces (Fig. 4: 1-5; 5). The massive, chunky axe, on the surface of which there are distinct patterns formed as a result of working wood, is an exception here (Fig. 6: 1). Common sense tells us that this artefact, due to its confirmed use history, was probably deposited together with a handle.

The recorded custom of burying people with sets of undamaged tools appears to be typical of the GAC community. The statement applies to all grave inventories subjected to use-wear analyses.

Problems with identifying the flint varieties used in the production of the tools were an obstacle in analysing the material. This issue appears to be somewhat complex. Still, this fact results from the considerable number of flint deposits to which the GAC society had access. It is also important that raw materials distributed throughout the eastern zone of the GAC – across the Volhynian-Podolian Upland - are not sufficiently known. On the other hand, this state of affairs is also caused by the internal diversity of nodules and visual similarities between materials yielded by different deposits.

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