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Jacek Górski[1], Mikołaj Orzechowski[2], Damian Stefański[3]

KRUMMESSER-TYPE KNIVES FROM THE SETTLEMENT OF THE TRZCINIEC CULTURE IN TUR DOLNY-BUSINA, SITE 3, DISTRICT PIŃCZÓW

ABSTRACT

Górski J., Orzechowski M. and Stefański D. 2022. Krummesser-type knives from the settlement of the Trzciniec culture in Tur Dolny-Busina, site 3, district Pińczów. *Sprawozdania Archeologiczne* 74/1, 501-512.

The paper discusses four Krummesser knives discovered on a multiphase settlement in Tur Dolny-Busina, site 3, Pińczów area, which is dated from the Early Bronze Age to the Early Iron Age. Until now, finds of these types of knives have not often come from safe archaeological contexts, which has fuelled discussions about their chronology. Two of the presented knives come from archaeological features linked with the Trzciniec culture, which provides valuable information on their chronology. The article presents a detailed description of the morphology of the artefacts. The geological analysis allowed us to identify the raw material. In addition, all artefacts were subjected to microscopic examination to determine the method of their production and documented traces of use on their surfaces. As a result of the conducted analysis, it was found that three of the knives were made from local raw materials with minimal modification, while the fourth seems to be made in a specialized workshop and is probably imported.

Keywords: Krummesser, stone knife, Trzciniec culture, Older Bronze Age
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1 Faculty of History and Cultural Heritage, The Pontifical University of John Paul II in Cracow, Kanonicza 9, 31-002 Cracow, Poland; Archaeological Museum in Cracow, Senacka 3, 31-002 Cracow, Poland; jgorski@ma.krakow.pl; ORCID 0000-0002-9680-1720
2 Archaeological Museum in Cracow, Senacka 3, 31-002 Cracow, Poland; mikolaj.orzechowski@ma.krakow.pl; ORCID 0000-0002-3020-9716
3 Archaeological Museum in Cracow, Senacka 3, 31-002 Cracow, Poland; damian.stefanski@ma.krakow.pl; ORCID 0000-0002-7203-6796

I. INTRODUCTION

At the end of the Early Bronze Age or the beginning of the Older Bronze Age, a new specific type of knives made of non-siliceous rocks (*Krummesser*) emerged in some regions of Poland. Their appearance is commonly linked with Transcarpathian influence (*cf.* Kopacz 2011, older literature there). Depending on the region of Poland, knives made of non-siliceous rocks are associated with the Trzciniec culture (Budziszewski 1998, 324, 325) or with the Otomani-Füzesabony culture (Valde-Nowak and Gancarski 1999, 183). They have recently been comprehensively studied (Libera *et al.* 2015). It seems that the connection of these particular tools with the Transcarpathian areas is obvious. Petrographic analyses of the finds showed that some of the tools were made of local raw materials (Libera *et al.* 2015), which seems to indicate their local manufacture.

These interesting finds are almost always devoid of an archaeological context. Therefore, the evidence of four knives of this type discovered in the village of Tur Dolny, commune of Michałów, located at the south-eastern end of the Jędrzejów Plateau (Fig. 1), is an important cognitive addition to the database known so far. An extensive settlement complex comprising over thirty, often multi-cultural settlements and cemeteries was located at the confluence of the Businka and Nida valleys. The excavations carried out in this area for nearly forty years have contributed to the identification of prehistoric sites dating from the Early Bronze Age to the Late Roman Period. The scientific value of the documented settlement is impacted not only by its broad chronological framework but also by its continuity

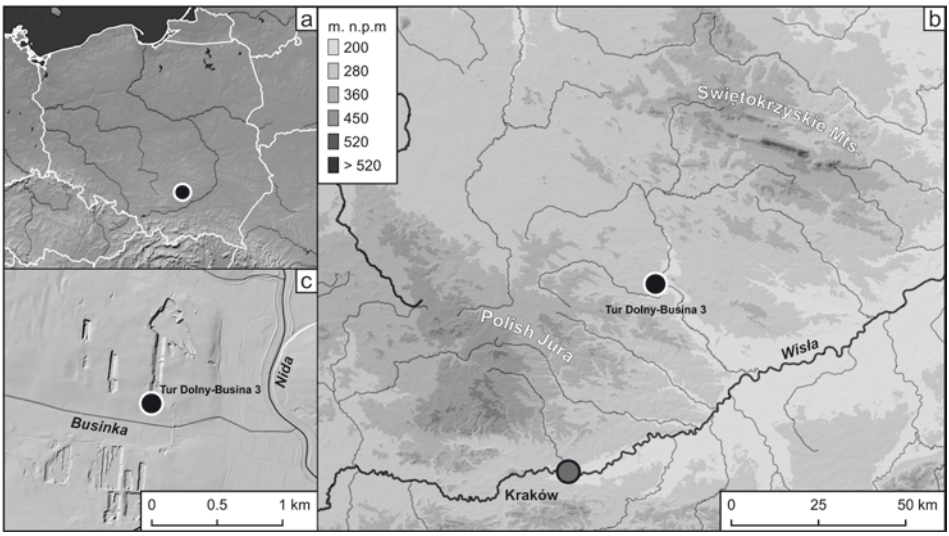

Fig. 1. Location of Tur Dolny, site 3
(prepared by M. Orzechowski, D. Stefański)

and the diversity of its character. All this has made it one of the most important complexes of prehistoric settlements in the Kielce region (Matoga 1998).

II. TUR DOLNY-BUSINA, SITE 3

The Older Bronze Age stadium of the prehistoric complex in Tur Dolny is documented by several archaeological sites. In most cases, the presence of the Trzciniec culture is indicated only by potsherds collected during numerous subsequent surveys. On the other hand, the excavated sites provided extensive, diverse and scientifically valuable archaeological evidence that confirms the entire development cycle of the Trzciniec culture in this part of the Nida Basin. It began with the contact of the newly arrived population with the Mierzanowice culture communities, then continued developing its patterns, and finally completed as a cultural contribution to the emergence of the early Lusatian cultural model in this region.

Tur Dolny-Busina, site 3 (Fig. 1), which is a large, multi-phase settlement located on the left bank of the Businka River, is a site of particular significance. Several seasons of excavations covering an area of 63 ares produced more than six hundred archaeological features, most of them associated with the Trzciniec culture settlement. A small settlement of the Mierzanowice culture, as well as a large settlement and two cemeteries (233 graves) of the Lusatian culture were also discovered here The majority of the pits were of a household nature. There were no features interpreted as residential, however, their traces could be seen as concentrations of post-holes discovered in different parts of the site. Excavations provided a massive amount of archaeological evidence. This is represented amongst other things by four Krummesser-type knives, labelled A-D (Figs 2, 4, 5). They were discovered in the area of an extensive, multiphase and well-documented settlement of the Trzciniec culture. Additionally, two of them come from features that have been precisely dated based on their distinctive ceramic finds.

III. ANALYSIS AND CULTURAL CONTEXT OF THE FINDS

These particular stone artefacts should be classified as knives. The typical nomenclature of flint knives (Krukowski 1939-1948) including terms such as working edge, back, half-back, and base was used for their description.

The first item, Knife A (Fig. 2) comes from the fill of a large pit (feature 252). It was recorded at a depth of *ca* 30 cm, it had the form of irregular and strongly blurred outline and measured *ca* 220 × 270 cm. During the exploration, the feature gradually decreased in size, finally taking on a near-circular shape. It had a flat bottom, reaching a depth of about 140 cm. The lower part of the pit contained an intensively black fill, saturated with a considerable amount of charcoal and ash. The finds were scattered mostly at a depth of *ca* 75-120 cm, while on the floor and in the uppermost fill of the feature they were less numerous.

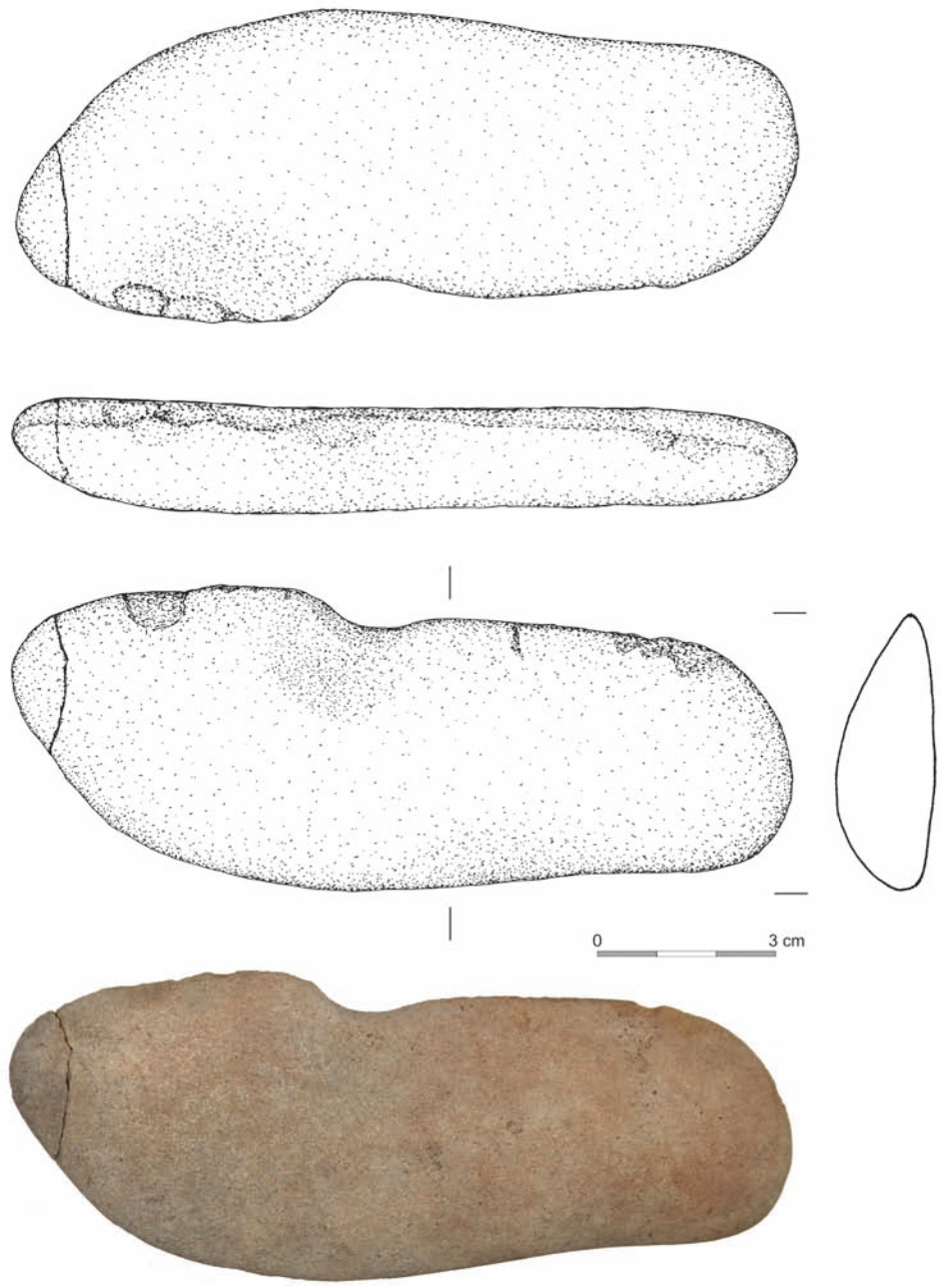

Fig. 2. Tur Dolny 3. Stone knife A, feature 252
(illustrated by A. Dziedzic, M. Orzechowski, D. Stefański)

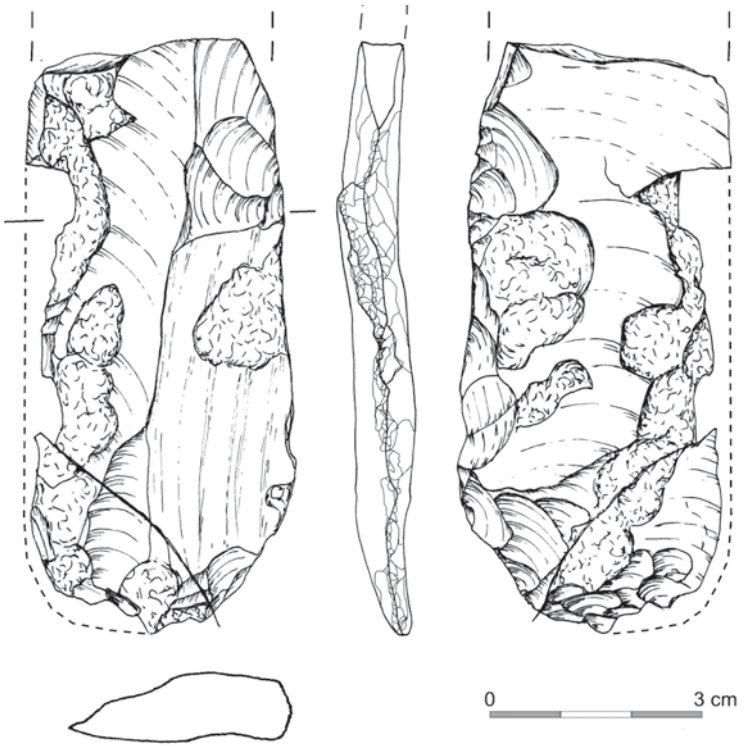

Fig. 3. Tur Dolny 3. Flint knife, feature 252
(illustrated by A. Dziedzic)

They included approximately 130 potsherds from several vessels (mainly pots) and lumps of daub with impressions of wooden structures and animal bones. The Krummeser was found at a depth of approximately 90-110 cm. An additional flint knife was discovered nearby (Fig. 3). The ceramic inventory refers to the so-called A2 type assemblages, which allows linking it to the classic phase of the Trzciniec culture (Górski 2007, 56-62). The observations made during the exploration of the pit and the presence of a considerable amount of constructional daub in its fill indicate that it was originally a large pit with walls strengthened by vertically driven stakes, lined from the inside with clay. There are indications that the described feature may have served as a smokehouse.

Krummesser A is made of very fine sandstone. The dimensions of the artefact are 132 × 52 × 17 mm. It is asymmetrical, plano-convex in the cross and longitudinal sections. The edge defined by the rounded base, the back and the adjacent diagonal half-back is strongly rounded. The working edge is more penetrating, with a distinct notch that starts at the base of the knife and extends to about 2/3 of its length. Due to the properties of the rock, the manufacturing marks are barely legible. The flat side of the tool was probably

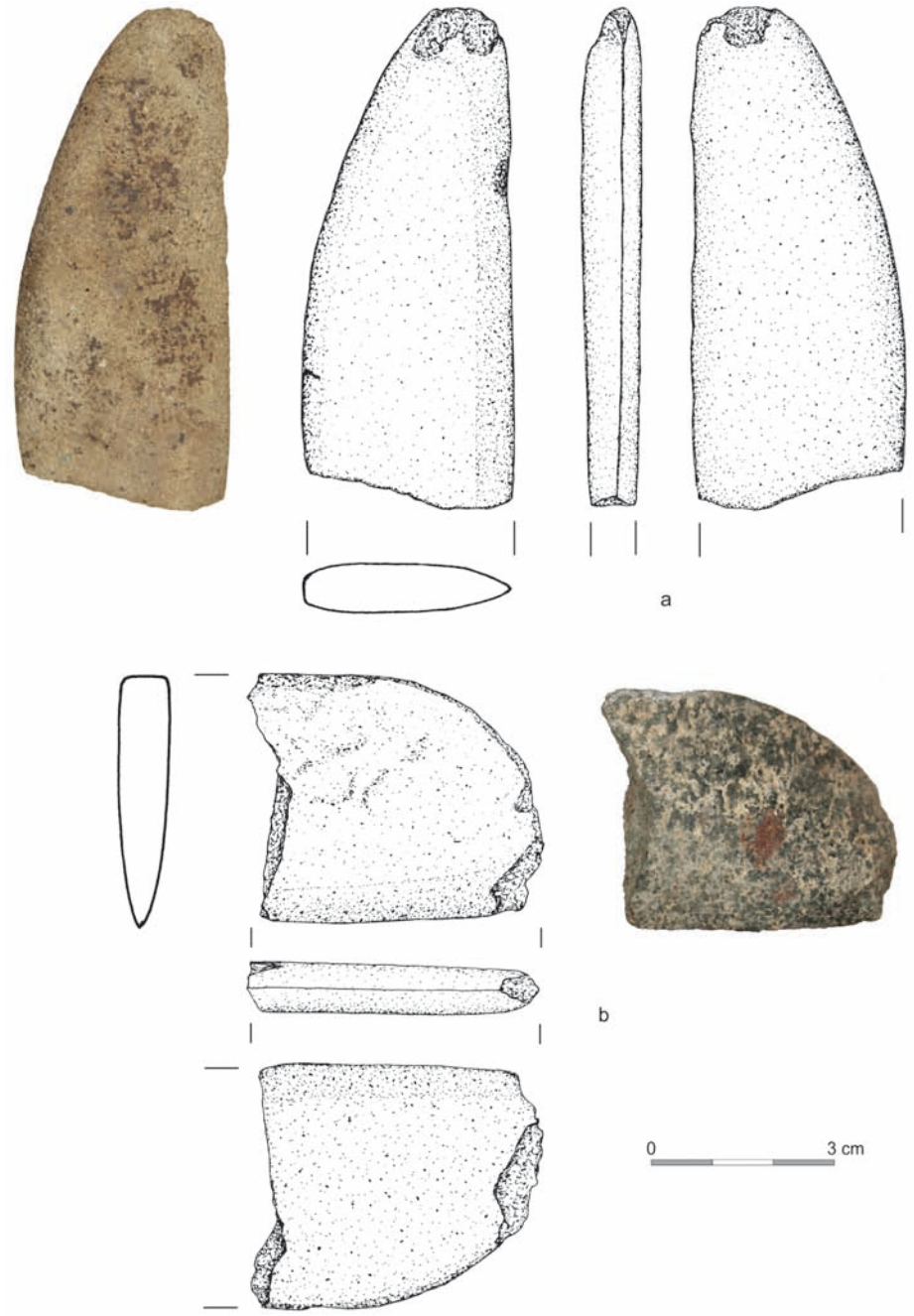

Fig. 4. Tur Dolny 3. Stone knives: a – Knife B, feature 315; b – Knife C
(illustrated by A. Dziedzic, M. Orzechowski, D. Stefański)

ground. There is evidence of a clear bevel of the working edge. The separated, bladed part of the tool has clear use-wear marks in the form of a micro-retouch. Slight denting is visible on the half-back and along the entire length of the working edge.

Although lithics are not the focus of this study, a flint knife found nearby is worth mentioning. This (Fig. 3) is a partially preserved, burnt and cracked knife made of a macrolithic, partially cortical blade. The preserved dimensions are 84 × 37 × 7 mm. The back has been shaped on the right edge with a bifacial, semi-steep retouch. Only in the middle part, is the back angled and blunter. This part is made with an additional, steep retouch, which has severely crushed this part of the tool. The proximal part is thinned using a flat, bifacial retouch. There is a well-developed sickle gloss on the left edge of the tool.

The second Krummesser, Knife B (Fig. 4: a) was discovered in the fill of feature 315. The pit was recorded at a depth of approx. 30 cm, it had an oval shape and measured *ca* 160 × 180 cm. With the exploration of successive levels, the feature decreased its size and took on a near-circular shape (in the middle part it had a diameter of *ca* 100-110 cm). It took the shape of a somewhat asymmetrical basin with the bottom reaching the depth of *ca* 140 cm in the cross-section. A nonhomogeneous fill yielded in total several dozens of potsherds dated to the period of the Trzciniec culture, a small number of lumps of daub and pieces of charcoal. Finds were discovered throughout the fill, but a clear accumulation was noted in the central part of the pit. The knife was found in the western part of the feature, at a depth of about 85 cm. The character of the fill and the recovered archaeological evidence indicate the economic character of the pit; however, it is not possible to define its function more precisely. The potsherds, although less numerous and more fragmented compared to the above – described feature (252), show analogous formal and chronological links.

Krummesser B (Fig. 4: a) is made of sandstone. It is partially preserved. The dimensions of the artefact are 82 × 36 × 10 m. The object is asymmetrical, similar to lenticular in the cross and longitudinal sections. The longer edge is convex and the back merges gently into the half-back. The convex edge is poorly penetrating. The preserved fragment of the working edge is formed by a distinct bifacial bevel. It is straight and much more penetrating. Due to the properties of the rock, the manufacturing marks are poorly legible. Use-wear marks include slight denting on the edge of the half-back and chipping of the tip.

The third Krummesser, Knife C (Fig. 4: b), is made of amphibolite. The artefact was found in a cultural layer. It is partially preserved. Its dimensions are 52 × 41 × 8 mm. The object is asymmetrical, wedge-shaped in cross-section and rectangular in longitudinal section. The longer edge is convex and the straight back merges into a strongly rounded half-back. The back is angular along its entire length. The surviving fragment of the opposite edge is straight, penetrating. The object has been made by grinding all surfaces, including the back, and slightly bevelling the working edge. Use-wear marks include bifacial chipping of the tip (or base).

Krummesser D (Figs 5, 6) is made of quartz sandstone. The artefact was found in a cultural layer. The item is asymmetrical, and the faces of the sides are slightly twisted. The dimensions of the artefact are 112 × 43 × 14 mm. It is lenticular in cross-section and rectangular

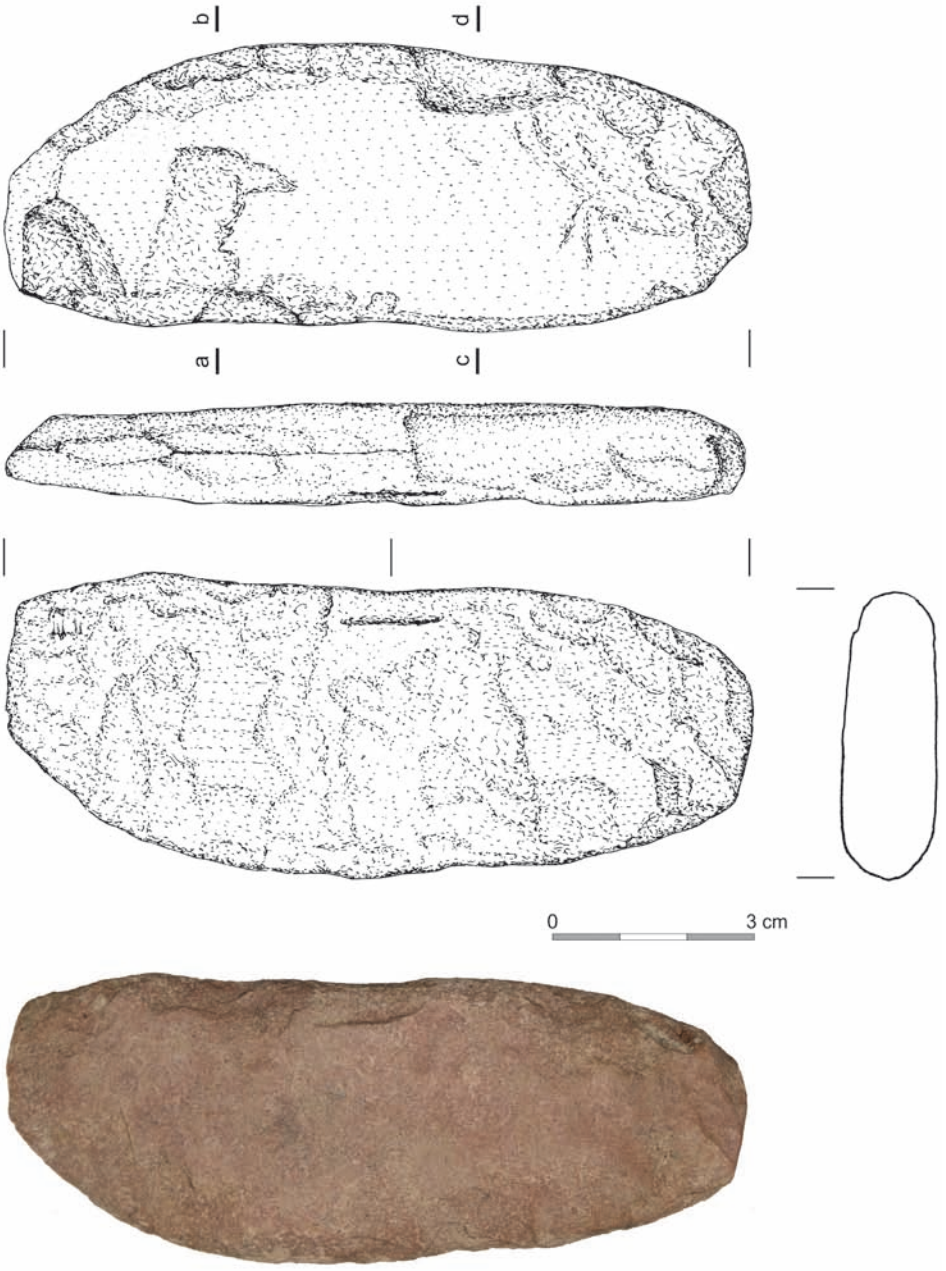

Fig. 5. Tur Dolny 3. Stone knife D
(illustrated by A. Dziedzic, M. Orzechowski, D. Stefański)

in longitudinal section. The longer edge is convex and the straight back merges into a strongly curved half-back. The natural surface has been preserved on the tips and locally on both flat sides. Its character indicates that the artefact was based on a flat erratic chunk.

IV. MANUFACTURING AND USE-WEAR TRACES

The surface of the worked stone artefacts was examined using stereoscopic and metallurgical microscopes. One of the artefacts, Knife D, was scanned with an Artec Space Spider 3D handheld scanner (Fig. 6). The inspection confirmed the thesis that, due to the nature of the rock materials used, the legibility of processing traces, as well as use-wear traces, is severely limited. However, this does not completely exclude the possibility of research on stone artefacts, as indicated for example by analyses of the function of stone grinders (Zupancich and Cristiani 2020; Dubreuil *et al*. 2015).

The presence of manufacturing traces in the form of surface grinding can be assumed from the general shape of the knives. The state of preservation of the natural surfaces indicates that it mostly involved only selected parts of the tool. Only in the case of Knife C, which differs from the other artefacts due to its shape and the raw material used, the processing of the entire surface should be assumed. In the case of specimens made of pebbles, it included only rough levelling of side faces and edges, as well as bevelling of the working edges. The microscopic examination did not confirm any obvious traces of grinding. Knife C features a slight polish on the whole surface. Only in some places, *e.g*. at the back, is the polish more intensive, which may indicate that the knife was hafted, more likely, that this part of the item was more intensively smoothed. On the other hand, in the

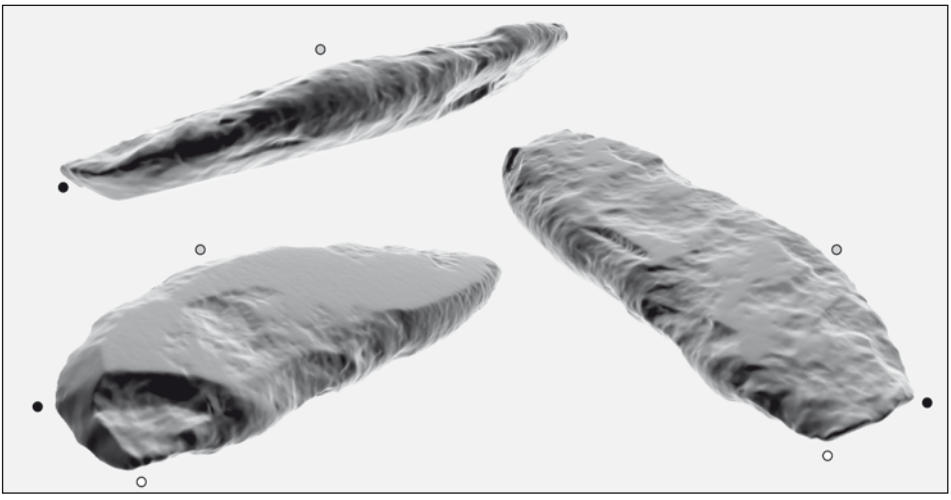

Fig. 6. Tur Dolny 3. 3D scan of stone knife D (illustrated by M. Orzechowski, D. Stefański)

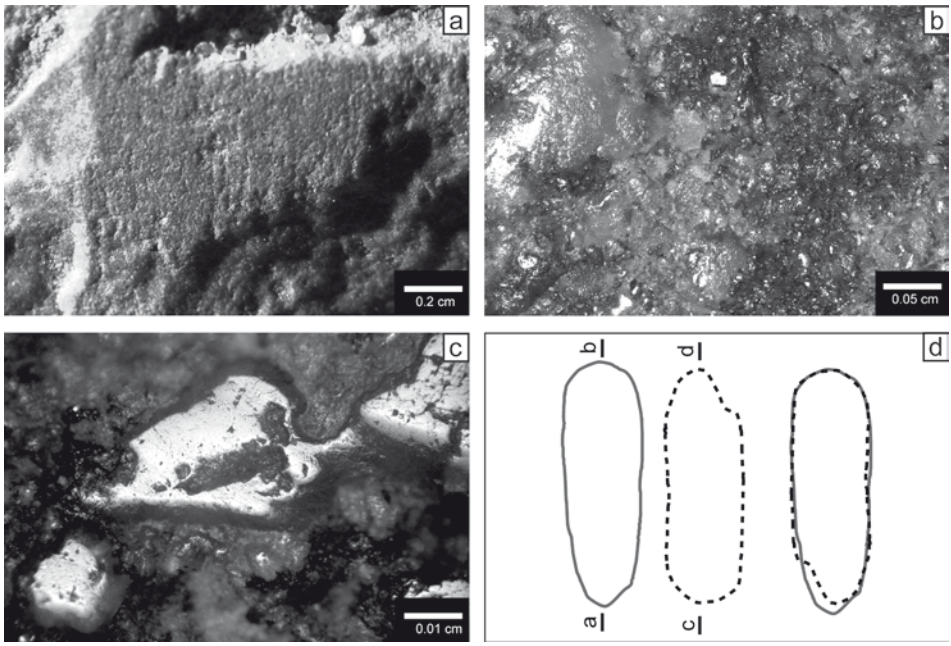

Fig. 7. Tur Dolny 3. Photographs of use-wear on stone knives: a – striations Knife D; b, c – polish Knife B; d – stone knife cross-sections obtained from the 3D scan of Knife D (illustrated by M. Orzechowski, D. Stefański)

case of Knife D, the presence of poorly visible striations, irregularly distributed and transverse to the tool axis, was noted (Fig. 7: a).

Use-wear traces on the knives were preserved mainly in the form of macro traces, such as microretouch, crumbling and edge denting. A common feature observed on the tools is the intense chipping of the knife tip (specimens B-D). This seems to be a typical feature, as we can observe similar ones in published examples (Libera *et al.* 2015). It should be mentioned that, apart from Knife C, which was probably manufactured in a specialised workshop, the other specimens were made *ad hoc* from readily available materials. The working edges of specimens A and B, even despite their bevelling, are characterised by poor penetrability and are not very functional. On the other hand, in the case of Knife D, the working edge as well as the back are blunted, and heavily rounded along a considerable length. A comparison of cross-sections generated from the scan (Fig. 7: d) indicated that this chamfer is identical for both edges. This suggests that the knife was reversible and both edges were formed by grinding in an identical groove or that the knife was used to form such a groove.

Microscopic traces on the analysed artefacts are almost non-existent. Only in the case of Knife B, intensive polishing of some grains of quartz crystals embedded in sandstone was documented (Fig. 7: b, c). They are different from the unpolished grains, which makes

it possible to indicate the zones of the tool that were in contact with the workpiece, as well as to determine its nature. The gloss is particularly intense on the working edge and one of the lateral faces in the section of the tip of the knife. Strong gloss, penetrating the relief of the grains indicate intensive work in unspecified soft material. At the same time, the tool itself must have been at an angle to the material being worked on, suggesting a scraping rather than cutting activity.

V. CONCLUSIONS

An analysis of the distribution of the artefacts in question did not reveal a clearly defined zone concentrating these finds at Tur Dolny-Busina Site 3. Features 252 and 315 were located in the central and northern parts of the site respectively approximately 40 metres apart. Another two Krummesser-type knives were discovered randomly in the cultural layer in different parts of the site. It should be noted, however, that both of these objects were discovered accompanied by numerous fragments of pottery linked with the Trzciniec culture.

The functionality of stone knives is severely limited by the mechanical properties of the worked material, which does not allow for such a sharp edge as characterised by flint or metal objects. Nevertheless, such tools were manufactured, as evidenced by archaeological and ethnographic analogies. Mention can be made of stone sickles found in Neolithic Southeast Asia (Yang *et al*. 2014), or "Ulu" stone knives used by the Inuit for fish processing, among other things. A strong functional limitation due to the nature of the stone raw material is evident in the case of three knives (items A, B and D), probably made *ad hoc* at the site from sandstone pebbles. The situation is different in the case of Knife C, which seems to be made in a specialised workshop. The properties of the raw material and its variation make the functional analysis very difficult and the results obtained are not uniform. Nevertheless, the data collected indicate that the knives were in use. Their function has not been definitively determined, although it seems that they were not standardised, as evidenced by the comparison of Knives B and D.

Although the presented flint knife is only an addition to this study, it is worth a few words in conclusion. The macrolithic size of a blade, the presence of a back and a harvesting function resemble Zele-type knives which are well documented for the Lusatian culture (Lech and Lech 1997, Trela-Kieferling 2013). While remains of this cultural unit are widely present at the site, the archaeological context indicates that the item should be linked with the Trzciniec culture. Additionally, the shape of the back differs from the very steep retouch characteristic of the Zele-type knives, which makes this artefact hard to interpret unequivocally.

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