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**Contribution to the research on the use of flint and stone
by the Lusatian culture population during the Bronze age and Early Iron age
in the Lublin region (remarks of a non-lithic expert)**

***Przyczynek do badań nad wykorzystaniem krzemienia i kamienia przez ludność kultury
łużyckiej na Lubelszczyźnie w epoce brązu i wczesnej epoce żelaza (uwagi niespecjalisty)***

The population of the Lusatian culture inhabiting the Lublin area during the Bronze age and Early Iron age used various items made of flint and stone. The most spectacular finds include sickles and sickle inserts with surface retouch. Items made from flint and stone were used mainly as tools, but also as weapons, as well as prestige indicators. They also had symbolic function. These artefacts were probably produced on site at settlements and they were among the accessories of everyday life of the population living then. In the Early Iron age, in the valley of the Vistula River, local flint deposits were exploited. Flint knapping workshops were set up here. Extremely numerous flint artefacts were recorded at these workshops and they represent the so-called Kosin industry.

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Items made from flint and stone that usually fulfilled various utilitarian functions, are among relatively frequent discoveries in the Lublin region, but at the same time their presence in assemblages is very limited. These artefacts, as well as the majority of non-specialized flint products recorded at settlements, were of wide use and were probably often utilized for various activities relating to processing of various raw materials (clay, wood, bone, hides, etc.). The use of some flint forms with a bifacial retouch as harvesting tools and other forms with similar retouch as weapons (biface points, arrowhead) raises no doubts. Similarly, the primary function of stone axes is associated with defence, but also with field cultivation, tree felling and carpentry, while stone querns and handstones are associated with cereals treatment (but also with grinding pottery temper and natural pigments – cf. Wichrowski 1989, 132). Also, the function of stone whetstones and casting moulds is obvious to us today. However, the role of flint and stone tools gained another dimension at the cemeteries, where these items earned new symbolic importance (Kłosińska 2012). At the same time, the number of items that were used as weapons or prestige indicators is difficult to be determined unequivocally. Only in the case of one stone mace specimen one can speak about the importance of this find as an insignia, although it should not be ruled out that also axes, hammers, and some flint products with retouched surfaces served a similar purpose.

In the various studies and in the documentation from archaeological works in the Lublin region a significant number

of flint products and semi-finished products has been mentioned that allegedly represent local Lusatian culture. Significant amount of items of this type have been documented on the AZP (Polish Archaeological Record) sheets, but mere localization deprived of closer context does not allow to treat them as crucial sources. Furthermore, one might have reservations regarding the cultural attribution in the case of flint artefacts originating from the surface and occupational layers of settlements, at which, besides the Lusatian culture materials, there were also multi-cultural materials. Therefore, such “flints” will not be the subject of the detailed studies here. Moreover, also flint artefacts coming from cemeteries, and sometimes originating from earlier times in the prehistory, will not be addressed here more comprehensively, even though their intentional deposition in cremation graves by the people of the Lusatian culture gave these items new importance, like the *casus* of Perespa, Tomaszów Lubelski district (Kłosińska 2012). To start with, finds that came from “homogeneous” closed assemblages were identified, meaning the ones, which consisted of artefacts that in 90–100% belong to the Lusatian culture. It turned out that in archaeological features, the number of flint artefacts that can be conclusively associated with the Lusatian culture pottery is not very impressive¹. Additionally,

¹ The largest collection of flint materials from the flint workshops was located in the immediate vicinity of a mining field from the locality Kopic, Kraśnik district (Vistula river area of the Lublin region).

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the current state of investigation of the settlements means that these materials do not constitute a full representation, as the vast majority of the finds has been obtained at the settlements from the Early Iron age. Most of these items have not been illustrated in the studies, which makes the analysis even more difficult. In this situation, it might be useful to consider a proposal for inclusion of artefacts from earlier periods, even from the Neolithic, in the flint inventory of the Lusatian culture (Dąbrowski 1996, 177, further literature there). This suggestion has a very good justification in the sepulchral materials of this culture dated to the Bronze age, as they attest that for the Lusatian culture population using older flint products did not pose any problem, what is more – it even seemed to be desirable (Kłosińska 2012, *passim*).

Therefore, in the collection of the Lusatian culture flint items from the Lublin region, originating from assemblages, there are natural specimens exemplified by chunks with natural surfaces, the presence of which was recorded in features, for instance, at the settlements in Chlewiska, Lubartów district (1 specimen) and Teptiuków, Hrubieszów district, site 6 (10 specimens). Some of these are simply fragments of erratic flint. Their relation with the features is unclear: they could easily represent unintended inclusions in the fill, but, on the other hand, they could have been used to secure raw material for further processing. Cores appear rarely in the assemblages. In two features in Chlewiska single specimens were recorded that had been made of erratic flint and Świeciechów flint². When discussing technical forms similarly rare splintered pieces should be mentioned. They include a specimen made from Volhynian flint coming from a residential feature in Hrubieszów-Podgórze, Hrubieszów district, and another one made from unidentified raw material and originating from the settlement in Teptiuków, site 6. The semi-finished products are represented by relatively numerous flakes, discovered at the settlements in: Chlewiska – amorphous specimens made from erratic flint (1 specimen) and Świeciechów flint (1 specimen), Hrubieszów-Podgórze – made from Volhynian flint (1 specimen) and unidentified raw material (1 specimen), Siedliszcze, Włodawa district – made from unidentified raw material (1 specimen), Sitaniec-Wolica, Zamość district – made from Volhynian flint (approximately 10 specimens), Strzyżów, Hrubieszów district – made from erratic flint (1 specimen), Teptiuków, site 6 – made from unidentified raw material (8 specimens), as well as chunks and production debris discovered in Chlewiska – representing erratic flint (32 specimens), Strzyżów – representing erratic flint (1 specimen) and in Szczekarków, Lubartów district – representing erratic flint (uncounted quantity). On the other hand, bladelet blanks are among rarely encountered forms of semi-finished products. They were discovered in the features in: Chlewiska – made from erratic flint (2 specimens), Hrubieszów-Podgórze – made from Volhynian flint (1 specimen), Strzyżów – made from erratic flint (2 specimens), Teptiuków, site 6 – made from Volhynian flint (1 specimen). The other rarely discovered forms include chips and spalls found in: Sitaniec-Wolica – representing unidentified raw material (1 specimen), Strzyżów – representing erratic raw material (1 specimen), Sitaniec-

Wolica – representing unidentified raw material (1 specimen), Teptiuków, site 6 – representing unidentified raw material (1 specimen), and Żółtańce-Kolonia – representing unidentified raw material (uncounted number of species). Some of these small artefacts bear traces of being burnt in fire.

Flint tools and weapons are rarely found in settlement features of the Lusatian culture population. One can mention here occasionally appearing artefacts with partial edge retouch, such as a partially preserved bladelet from Hrubieszów-Podgórze (made from Volhynian flint [1 specimen]), a perforator with retouched longer edges from Podlodów, Tomaszów Lubelski district (made from Volhynian flint [1 specimen]), a chisel made on a damaged blade with retouched places where braking of took place from Sitaniec-Wolica (made from Volhynian flint [1 specimen]), and a heart-shaped arrowhead with retouched edges from Mołodutyn, Chełm district (made from unidentified raw material [1 specimen]). At the same time, slightly more flint artefacts originating from the Lusatian culture assemblages from settlements are characterised by a bifacial retouch. Among these spectacular finds, which in fact were subject of the recent comprehensive study (Libera 2001, *passim*), one has to mention slim sickle-shaped knives from Opoka, Puławy district (made from Świeciechów flint [2 specimens]), and the specimens from Teptiuków, site 6 – Fig. 1:1,2 (made from unidentified raw material [2 specimens]), which are crescent-shaped with defined base and the inner side straight or slightly concave. They represent the types BAI and BAII according to the classification by Jerzy Libera (2001, Fig. 20). A partially preserved bifacial point, with a leaf-shaped blade and poorly defined, short and broad tang Fig. 1:3, probably originates from a residential feature from the locality of Zagroda, Chełm district. This specimen was made from Rejowiec flint and is characterized by a significant asymmetry. Another type of points, the surfaces of which were formed by a bifacial retouch, is represented by leaf-shaped arrowheads with more or less defined tangs. They belong to finds infrequently discovered in features, and they were recorded at the settlements in: Zagroda – Fig. 1:4 (made from Rejowiec flint [1 specimen]) and Żółtańce-Kolonia (made from Rejowiec flint [1 specimen]). In turn, in one of the features at the settlement in Mołodutyn a form obtained from a core tool, i.e. a flake struck from a polished bifacial axe (made from unidentified raw material [1 specimen]) was discovered.

Number of other flint artefacts was discovered both on the surface of and within occupational layers at settlement sites. The association of these finds with the Lusatian culture is very likely not only due to the fact that the dominant pottery material discovered at the sites belonged to the Lusatian culture, but also considering the typological similarity of the finds to those discovered in assemblages, as well as on the basis of morphological criteria. It is thought that some of the knife-like tools from the cultural layer at the settlement in Giżyce, Lubartów district, could belong to the Lusatian culture (Rejniewicz [with the team] 2004, *passim*), as well as numerous flint products and semi-finished products discovered in similar circumstances at the settlement in Mołodutyn, such as: an initial core, a hammerstone, flakes stricken from axes, retouched blades and flakes, splintered pieces, perforators, heart-shaped and tanged arrowheads, fragments of bifacial tools – knives and sickle-shaped inserts (Mazurek 2005, 78,

² The shape of these cores has not been described.



Fig. 1. Finds of flint tools from within the settlements areas in Teptiuków, Hrubieszów district, site 6: sickle-shaped knives – 1, 2. Photo by A. Hyrczała; Zagroda, Chełm district, site 26: a bifacial point – 3, and an arrowhead – 4. Photo by G. Zabłocki; Lubartów, Lubartów district, site 1: an arrowhead – 5. According to Kłosińska 2004

Ryc. 1. Znaleźiska narzędzi krzemiennych z terenów osad w Teptiukowie, pow. hrubieszowski, stan. 6: nóż sierpowaty – 1, 2. Fot. A. Hyrczała; Zagroda, pow. chełmski, stan. 26: ostrze bifacjalne – 3 i grot strzały – 4. Fot. G. Zabłocki; Lubartów, pow. lubartowski, stan. 1: grot strzały – 5. Wg Kłosińska 2004

Fig. 4:1–10; also unpublished materials). It is probable that the impressive tanged arrowhead, Fig. 1: 5, from Lubartów, district Lubartów, should also be associated with the Lusatian Culture materials, as well as some sickle-shaped knives and fragments thereof, located within the cultural layer at the settlement in Teptiuków, site 6, and sickle-shaped inserts also referred to as “sickle-shaped inserts of the Szuminka type” (Mazurek 1997). The latter, rather small-sized items of triangular or crescent-like shape, quite numerous in the area of the Lublin region, especially in Polesie, between the middle Bug river and Wieprz river (Mazurek 1997, 186, Fig. 1), were the cutting segments of larger tools used probably for cereal harvesting or cutting other herbaceous plants (Fig. 2:1,2). On their denticulate working edges preserved traces of strong use polish. The specimens that were discovered within the range of the settlement in Szuminka, Włodawa district, are dated to the Late Bronze age and Early Iron age (*ibid.*, 185, 188). It is also believed that the use of the sickle-shaped flint inserts took place exclusively during the Early Iron age (Bargieł, Libera 1997), which allows to identify these items as the Lusatian culture tools.

Discoveries of extremely rich flint inventories made in the recent years within the Vistula river area of the Lublin region (Kosin, Kraśnik district, site 10, Kopiec, sites 4 and 8), became the basis for significant morphological determinations and identification of the main characteristics of the flint knapping of the Lusatian culture population inhabiting this part of the Lublin region, which are defined as the „Kosin industry” (Libera 2005, 148; Zakościelna ed. 2019). Considering the new discoveries, the phenomenon referred to under this term, which until recently was identified exclusively with the Tarnobrzeg culture of the Lusatian culture milieu by the Vistula river and San river, has a much wider range and is relevant when considering the Lusatian culture flint production within broader areas, stretching beyond the Lublin region³. During the Early Iron age, at the above mentioned sites, and basing on the local raw material deposits of Świeciechów flint and Gościeradów flint, numerous semi-finished and finished flint products were made. In Kosin, site 10, they included mainly flakes and massive blades, usually twisted in their plane, as well as blade and flake cores and flake cores. Not many tools were identified here, and they include: retouched flakes and use polished blades without retouch (Bargieł, Gurba 1986, 28, 32). Within the workshop in the immediate vicinity of the mining field in Kopiec, site 4, massive crescent-shaped sickles dominated that had been bifacially retouched. They were at various stages of production. The amount of other, smaller tool forms, such as scrapers, scrapers, and others was significantly smaller (Florek, Libera 1994, 9; Bargieł, Libera 1995, 13). Several rough outs of closer unspecified bifacial forms were also identified within the area of yet another flint workshop in the immediate vicinity of the mining field in the same locality, at site 8. Semi-finished sickle-shaped knives, numerous retouched flakes, and infrequent scrapers, scrapers, endscrapers, borers, splintered pieces, and a single point were discovered here (Florek, Libera 1994, 13). Judging by the pottery from the Early Iron age coexisting with very numerous flint products and semi-finished products from the

nearby Potoczek, Janów district (Libera 1988, 3), also a part of these flint artefacts represents the flint production of the “Kosin industry”.

Workshops located at the mining field situated within Pagóry Chełmskie (Eng. Chełm Hills), which based their production on local Rejowiec flint, were also used by the Lusatian Culture population. It is thought that miniature, bifacial axes, backed knives, sidescrapers, knife-shaped tools, and perforators with bifacially retouched projecting point belong to the population of this culture (Libera 2003, 24).

As already mentioned, flint artefacts were also frequently present at the cemeteries of the Lusatian Culture in the Lublin region. Some of them are items “assimilated” by the Lusatian culture population from the older periods (e.g. in the case of scarcity of raw material), and in turn some of them represent “own designs” matching the criteria of the “Kosin industry”. At the cemeteries were both sickle-shaped knives (crescent-shaped specimen made from Volhynian flint from Pokrówka, Chełm district – Fig. 3:1) and sickle-shaped inserts (damaged specimen probably made from Volhynian flint from Pobołowice-Kolonia, Chełm district – Fig. 3:2). Analogous items were also put inside cinerary urns themselves (Świeciechów Duży, Kraśnik district, Wronowice, Hrubieszów district – Kłosińska 2012, Table 1). At the cemetery in Komarów-Osada, Zamość district, flint artefacts occurred in cinerary urns or next to them in particularly high amount. Their number includes: a burnt chip (near burial 4, next to the bottom of the urn – Woźniak 2009, *passim*), a burin and backed piece made from Volhynian flint (in burial 6 – Bagińska, Libera 1996, 72; Woźniak 2009, *passim*), a crested blade, flake and blade (in burial 25 – Bagińska, Libera 1996, 72), burnt chunks (in burial 39 – Woźniak 2009, *passim*), two chunks, including one burnt (in burial 47 – *ibidem*), a splintered piece made from erratic flint, burnt chunk (in burial 48 – *ibidem*), a splintered piece made from erratic flint (in burial 52 – *ibidem*), three flakes (in burial 53 – Bagińska, Libera 1996, 72), a piece of flint (in burial 60 – Woźniak 2009, *passim*). Also, a large series of flint items was recently discovered at the site in Siedliszcze (Libera 2006a), the sepulchral nature of which, as compared with most cemeteries in the Lublin region, seems to be controversial. Among others, a number of core forms and technological forms, semi-finished products and retouched pieces had been made here. In the burials themselves flake cores were present, as well as flakes (including partially retouched ones), tools with retouched notch, concretions and chunks, and one tanged arrowhead, which, what is unusual, was made from a blade blank. Some of these flint artefacts, for instance notched tools and others, comply with the standards of the Kosin industry (*ibidem*, 304).

Unfortunately, almost all stone axes discovered in the Lublin region that could be associated with the Lusatian culture were found without any context that would attest such identification. Only a half of a stone axe and a stone core from drilling, originating from the settlement features in Teptiuków, site 6, seem to confirm that the Lusatian culture population, inhabiting this site during the Bronze age and Early Iron age, produced and used this type of tools (cf. Niedźwiedź 1996, 141, Fig. 2:9; Jeliński 2002, 59, 70, 98, Fig. 40:g; 49:e). In one of the settlement features in Szuminka a small fragment of a stone axe was in one assemblage with sherds of pot-shaped

³ Information from Jerzy Libera, PhD, associate Professor at the UMCS, for which I would like to express my gratitude.



Fig. 2. Visualization of a harvest of the Lusatian culture population. Drawing by E.M. Kłosińska and T. Demidziuk. Reconstruction of a sickle with flint inserts. Photo by G. Zabłocki

Ryc. 2. Wizualizacja zbierania plonów przez ludność kultury łużyckiej. Rys. E.M. Kłosińska i T. Demidziuk. Rekonstrukcja sierpa z wkładkami krzemiennymi. Fot. G. Zabłocki



Fig. 3. Finds of flint tools from within the cemetery areas: in Pokrówka, Chełm district, site 3: a sickle-shaped knife – 1, Pobołowice Kolonia, Chełm district, site 8: a sickle-shaped knife – 2. Photo by G. Zabłocki

Ryc. 3. Znajdźiska narzędzi krzemiennych z terenów cmentarzysk: Pokrówka, pow. chełmski, stan. 3: nóż sierpowaty – 1, Pobołowice Kolonia, pow. chełmski, stan. 8: nóż sierpowaty – 2. Fot. G. Zabłocki

pottery vessel associated with the younger stage of the Early Iron age (Mazurek 1992, 6, plate VI:1,2). A fragment of the cutting edge from Swaryczów, Zamość district, was identified within a layer at a multicultural site, which only with certain probability allows to associate this find with the distinguished there phase of Lusatian culture occupation. However, none of the listed stone axes preserved in a state that would allow reconstruction of its original shape.

Stone axes devoid of context, which are characterised by a pentagonal outline as seen in frontal view and square cross-section, provide a certain premise to include them among the tools used by the population of the Lusatian culture (cf. Kostrzevska 1953, 239). In some studies analogous finds are associated exclusively with this culture and it is rightly pointed out that at the Lusatian culture sites these finds are more common than axes made of bronze or iron (Dąbrowski 1996, 177). Also other axes are recorded, for instance, double-edged ones with rhomboid outline. In the case of some specimens the particular elongation of the part adjacent to the cutting edge draws attention (in some specimens this part is over three times longer than the butt part of the axe), which allows to assume that these items could have been used as mattocks. Use of some of the axes for agricultural activities was already stressed in the literature of the subject, and their association with hoe cultivation was supposedly attested by their presence

in female burials from the 4th and 5th period of the Bronze age (Mikłaszewska-Balcer, Miśkiewicz 1968, 107).

Considering the characteristic form as many as several dozens of stone axes could be associated with the Lusatian culture⁴, however, none of them was included in the classification of these artefacts written by Jerzy Fogel (1981, 160–177), which is so far the most comprehensive of its kind existing in the scientific circulation. All the finds from the territory discussed here have their counterparts in this publication. It seems that these axes acted primarily as tools, but they could also have been used as occasional weapons. The varied size, bulkiness and the specific proportions suggest that some of them were designed for “special tasks”, as it is believed that the size and weight of them intensified the impact force (p. 170). Therefore, considering their proportion and sizes, it cannot be excluded that the specimens from Okszów, Chełm district (Fig. 4:1) and Malinówka, Chełm district (Fig. 4:2) were used for heavier work, e.g. for clearing of forest and grubbing, as well as for preparing new land for agriculture.

⁴ In the latest, unpublished study of items of this type (Dobrzyński 2008), only two stone axes from the Lublin region were associated with the Lusatian culture. These are: the specimen from Bukowa Mała-Kolonia, Chełm district, site 15, and from Mieniany, Hrubieszów district.

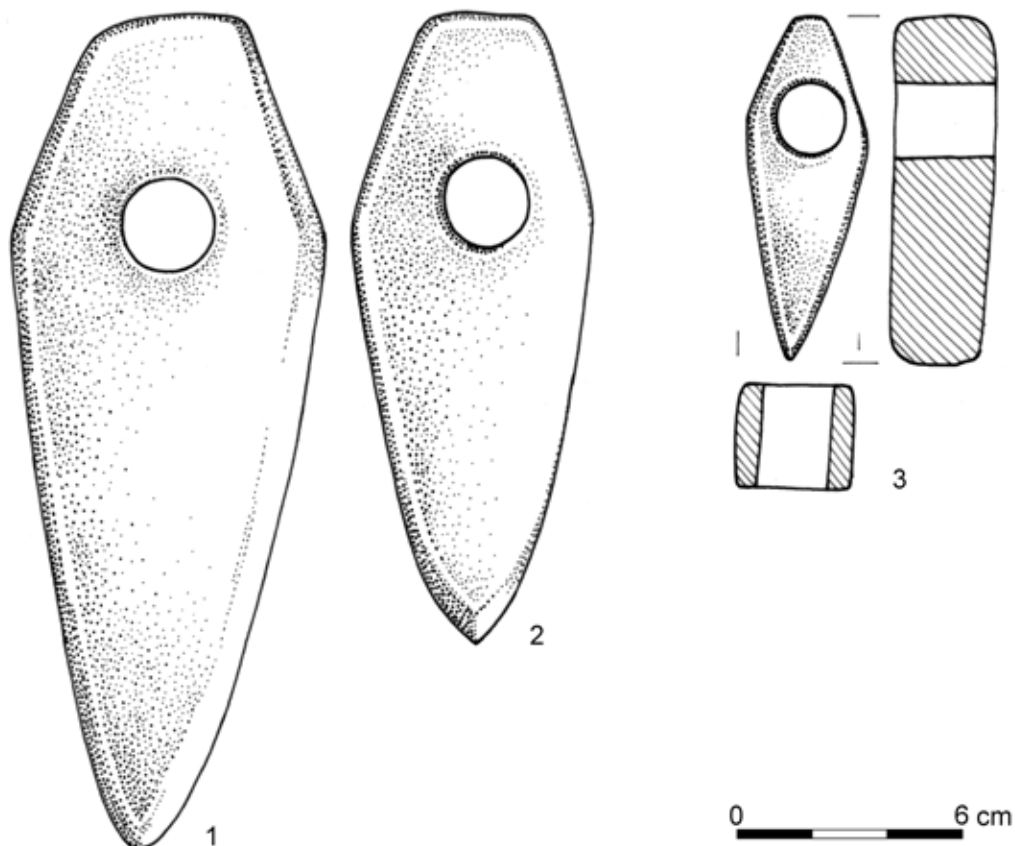


Fig. 4. Contextless discoveries of stone tools: Okszów, Chełm district: a shaft-hole axe – 1, Malinówka, Chełm district: a shaft-hole axe – 2. According to Supryn, Hunicz 1970; redrawn by T. Demidziuk; Karczmiska, Opole Lubelskie district: a shaft-hole axe – 3. Drawn from life by E.M. Kłosińska, redrawn by T. Demidziuk

Ryc. 4. Luźno znalezione narzędzia kamienne: Okszów, pow. chełmski: siekiera z otworem – 1, Malinówka, pow. chełmski: siekiera z otworem – 2. Wg Supryn, Hunicz 1970; przerys. T. Demidziuk; Karczmiska, pow. opolski: siekiera z otworem – 3. Rys. E.M. Kłosińska, przerys. T. Demidziuk

The smaller specimens could have served other tasks such as wood working or fighting, or they could have been indicators of prestige. Such a function was probably fulfilled by a small specimen diligently made from a crystalline rock with fine-grained structure discovered in Karczmiska, Opole Lubelski district (Fig. 4:3).

Finds of two hammers devoid of context from Siedliszcze, Włodawa district (Fig. 5:1) and Malinówka, Chełm district (Fig. 5:2,3) find no counterparts in the Lusatian culture environment outside the Lublin region⁵. The latter specimen attracts particular attention. It is barrel-shaped with a centrally located shaft hole and flat, circular butts of similar size. The item was made from grey “distinctively stratified” stone (Skibiński 1964, 105). Undoubtedly, this artefact should be associated with broadly understood Eastern European cultural milieu of the pre-Scythian period. Cylindrical or barrel-shaped stone hammers, included in the category of combat accessories, appeared relatively frequently in Cimmerian

assemblages in the steppe territories north of the Black Sea. They were made from hard stones and their surface was carefully polished (Terenzhkin 1976, 140; Makhortikh 2002, 199). Single specimens were also recorded within the forest steppe zone, not only at the late sites of the Chernoles culture by the Dnieper river (Terenzhkin 1976, 140) and among the Neporotove group of this culture by the middle Dniester river (Krushel’nic’ka 1998, 201), but also in the assemblages of the Holihrad culture on the latter territory (Sveshnikov 1964, 53; G.I. Smirnova 1998, 454). In turn, quite numerous specimens occurred in the Wysocko culture in western Ukraine (Sulimirski 1931, 140), as constituents of grave inventories at the biggest cemeteries in Wysocko (Висоцьке), Luhove (Лугове), and Zolochiv (Золочев) (Krushel’nic’ka 1965, 131; Bandrivs’kij 1994, 128; Bandrivs’kij, Krushel’nic’ka 1998, 236). In the Wysocko culture stone hammers are associated with a relatively narrow time horizon, occurring during the HaB phase of the Bronze age (cf. Bandrivs’kij, Krushel’nic’ka 1998, 236). However, it is also worth noting that the finds from here are inferior to the Cimmerian ones not only when it comes to the raw material used, i.e. marl, sandstone, but also when it comes to the treatment on the surface (Terenzhkin 1976, 140). The hammer from Malinówka is likely an import from this cultural environment.

⁵ In the Chełm Museum in Chełm there is a semi-finished barrel-shaped hammer devoid of context that had been made from holocrystalline rock. This artefact, originating from Husynne, Chełm district, was broadly assigned to the Neolithic and Bronze age (Bronicki, Izycka 2008, 235, Fig. 20:1).

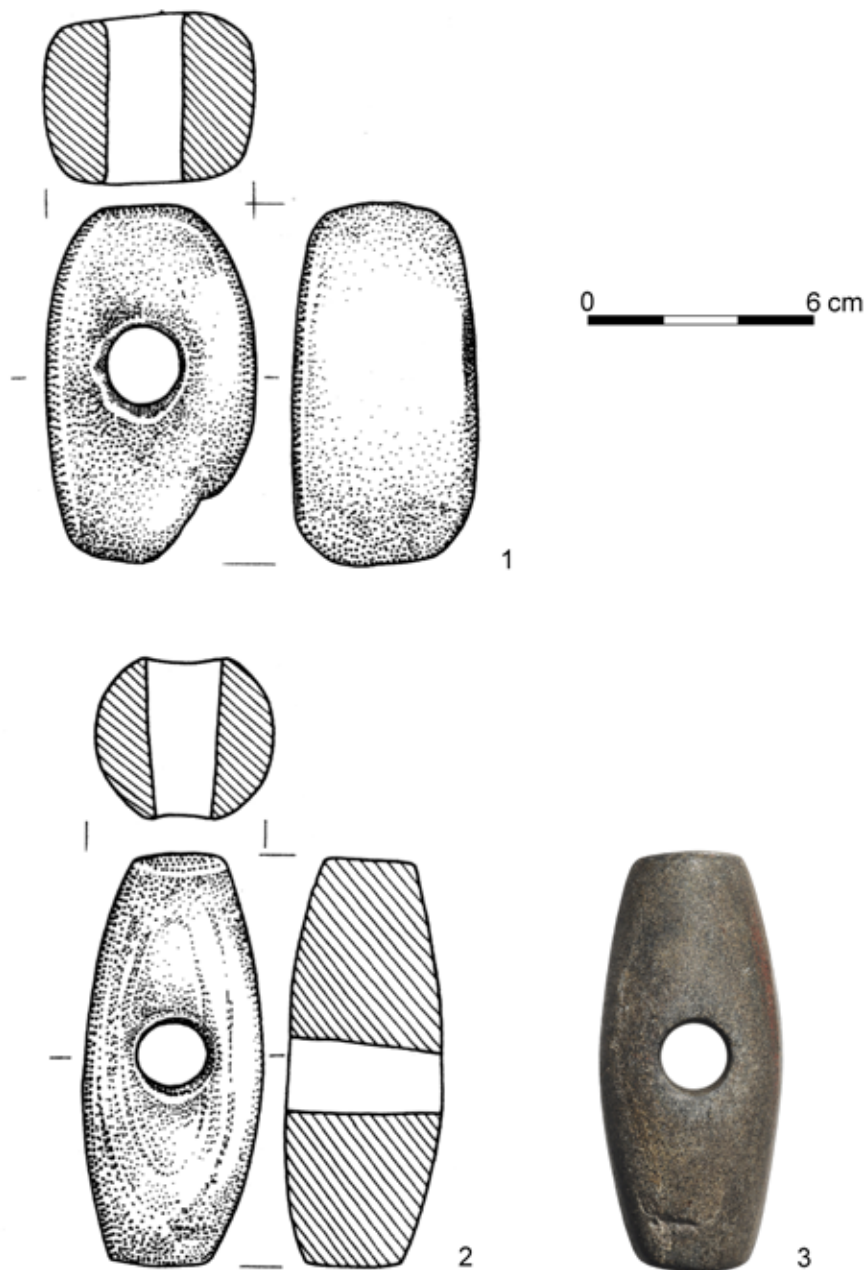


Fig. 5. Contextless discoveries of stone tools. Siedliszcze, Włodawa district: hammer – 1. According to Bargieł, Libera 1989; redrawn by T. Demidziuk). Malinówka, Chełm district: hammers – 2, 3. According to Supryn, Hunicz 1970; redrawn by T. Demidziuk; photo by G. Zabłocki

Ryc. 5. Luźno znalezione narzędzia kamienne. Siedliszcze, pow. włodawski: młot – 1. Wg Bargieł, Libera 1989; przerys. T. Demidziuk). Malinówka, pow. chełmski: młoty – 2, 3. Wg Supryn, Hunicz 1970; przerys. T. Demidziuk; fot. G. Zabłocki

The only stone mace specimen (Fig. 6), made from granite with fine-grained structure is a stray find coming from Krasnystaw, Krasnystaw district. The item was included among the artefacts belonging to the Lusatian Culture⁶; its association with one of the cemeteries known from archives but with no precise localization within the mentioned town cannot be excluded. The mace was formed very diligently into the shape

of a mutually flattened sphere (the side edge is slightly marked). The hour-glass shaft hole was probably made by drilling from two sides. The edges of the hole were then faceted⁷. In many details this item resembles some of the maces discovered at the sites of the Lusatian culture in Pomerania, Kuyavia, and

⁶ Cf. the Catalogue of the Regional Museum in Krasnystaw.

⁷ Similar technique of finishing the shaft hole was observed in the case of a few mace specimens discovered at one of the Lusatian culture cemeteries in Silesia (cf. Lasak 2005, 77, Fig. 4:10; 2008, 291, 296).

central Poland (cf. Fogel 1981, Fig. 5:f,g,i)⁸ that are dated to the 4th period of the Bronze age, or within a broader range, i.e. between the 4th period of the Bronze age and the HaC phase (cf. Lasak 2008, 294, 296, 297 [further literature there]). The mace from Krasnystaw may be an artefact from the Bronze age, which is indirectly indicated by the lack of inhabitation in this town of the Lusatian Culture population dated to the Early Iron age. The vast majority of maces (also referred to as club heads – cf. *ibidem*, p. 291), discovered in the Polish lands, originated from sepulchral sites, where they had been deposited among grave goods in burials of adults of both sexes. Similar location was also recorded in the case of the Central European finds (Berounská 1987, Fig. 1 and others), as well as those from the areas of Western Ukraine (Sulimirski 1931, 141–142, plate XXIV:13). The function of these items has been widely discussed. The role of a weapon as well as the role of a social status indicator were attributed to them (Lasak 2008, 291–293 [further literature there]). Maces of a shape similar to the find from Krasnystaw, were recorded, among others, at the sites of the Mound culture of the middle Danube river, the Lusatian culture, and the Knoviz culture (Berounská 1987, 47). Therefore, the time frame of the use of such items in Central Europe was quite large.

Querns, mostly preserved in fragments, were obtained mainly from settlement sites (Gródek, Hrubieszów district, site 1A; Opoka; Pniówek, Zamość district, site 15; Podłodów, site 59; Teptiuków, site 6; Wojciechów, Włodawa district, site 8; Wronowice, site 5), from cemeteries (Pokrówka, site 3), and from the surface of sites of unidentified nature (Lejno, Włodawa district, site 28). The querns from Teptiuków and Wronowice have a concave shape (Wichrowski 1989, 130; Jeliński 2002, 59). There is no information regarding the shape of the remaining finds of querns. Neither the raw material was more precisely identified from which they had been made. Despite such brief information it can be assumed that when it comes to the shape, these tools from the Lublin region did not differ from the querns used by the Lusatian Culture population in other areas (e.g. proto-rotational forms – cf. Gardawski 1979, 270). The presence of relatively numerous, spherical handstones at the Lusatian culture sites in the discussed region suggests that the number of querns could have been greater than the one attested by the material sources. The querns were noted in both within cultural layers (Kuśnierz, Niedźwiedź 1999, 97), and in features (Niedźwiedź 1987, 14; Wichrowski 1989, 104; Jeliński 2002, 59). A set of a quern and handstone was discovered in feature 17–17A at the settlement in Teptiuków, site 6 (Jeliński 2002, 59), and in the corner of the residential dwelling number 2 in Wronowice, behind a construction post, a quern was deposited upside down covering a smaller stone, probably a handstone (Wichrowski 1989, 104, 130, Fig. 4:a). The nature of the pottery materials that occurred in the mentioned features allows to believe that such model of querns was used by the Lusatian culture population during the Bronze Age.

⁸ It is worth noting that the highest frequency of occurrence of this type of artefacts took place in Silesia and in Greater Poland (Fogel 1981, Fig. 10). For a couple of times they have been subject of more detailed studies (Dobrogowski 1938, 63–65; Maciejewski 1950, 106–107; Kostrzewska 1953, 246–247, 254; Fogel 1981, 177–179; Lasak 2008).

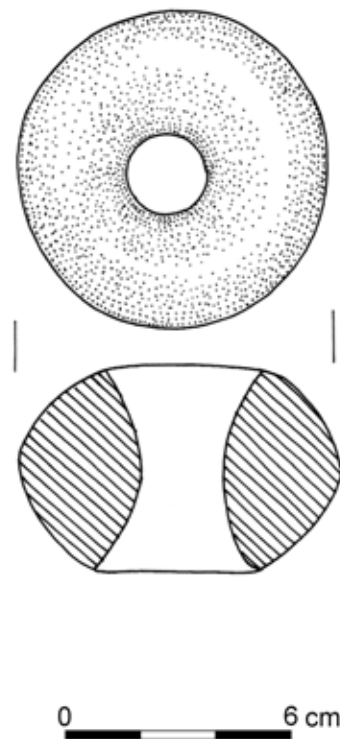


Fig. 6. Contextless discovery of a stone mace from Krasnystaw, Krasnystaw district. Drawn from life by E.M. Kłosińska, redrawn by T. Demidziuk

Ryc. 6. Luźno znaleziona kamienna buława z Krasnystawu, pow. krasnostawski. Rys. E.M. Kłosińska, przerys. T. Demidziuk

Similar tools could probably also constitute an element of later settlements, at which pottery vessels from the Early Iron age were identified, such as bag-shaped pots and bowls with inverted rims (Opoka, Wojciechów).

Pebbles of comparable size that easily fitted in the palm of a hand were used for the production of handstones. This category of finds is the most numerous one among the stone tools that were used by the Lusatian culture population on the Polish territory both during the Bronze age and the Early Iron age (Kostrzewska 1953, 235). In the Lublin region handstones are also equally frequent finds but with an uncertain cultural association, as most of them were recorded on the surface of sites of unidentified nature (Chyżowice, site 1, Hrubieszów district; Cześniki, site 19; Kołacze, site 45; Marysin, site 7; Mojsławice, site 7; Skibice; Świdniki, site 5; Wereszyn, site 35; Zaborce, site 3). A few such items originated from cemeteries, both from burials and from the space between them (Horodyszczce, site 11; Łuszczów-Kolonia, site 1; Wieprzec, site 1). However, the most noteworthy are the finds from settlements (Szczekarków, site 6; Teptiuków, site 6; Teptiuków, site 7; Wronowice, site 5), sometimes discovered together with querns (see above). The tools from the settlements are characterised by significant wear and, most often, by irregularly spaced abrasive surfaces, while the specimens from cemeteries – by circumferentially worn side surface or two frontal surfaces. It seems that these differences result rather from the degree of wear of the handstones and not from their different function. Similarly as in the case of the querns, the Lusatian culture population in the Lublin

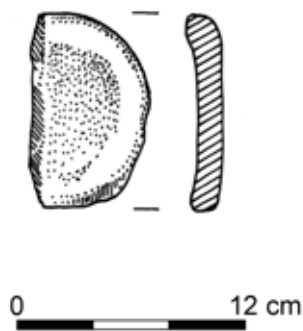


Fig. 7. Stone pad discovered within the area of an alleged cemetery in Majdan Górny, Tomaszów Lubelski district. Drawn from life by E.M. Kłosińska; redrawn by T. Demidziuk

Ryc. 7. Kamienna podkładka odkryta na terenie domniemanego cmentarzyska w Majdanie Górnym, pow. tomaszowski. Rys. E.M. Kłosińska; przerys. T. Demidziuk

region used the handstones both during the Bronze age and the Early Iron age.

Polishing tablets are rarely encountered on the territory discussed here. Such items, of not closer specified shape, occurred in features at the settlement in Mołodutyn (Mazurek 2005, 78), Sitaniec-Wolica (Buszewicz 2004, 9), and within the newly discovered settlement of the Lusatian culture population in Niezdów (cf. Rejniewicz, Padło, Ratajczak 2009). A polishing stone was also encountered within the area of the cremation cemetery in Topornica (Głosik 1958, 188), but the relationship between this artefact and the necropolis is not entirely clear⁹. In turn, a broken, fine-grained stone of grey-creamy colour (sandstone?) with a polished surface is the only tablet/stand of unclear function from the area of the Lublin region. Originally, it was probably round or slightly oval in shape (with the diameter of approximately 10 cm), and in the central part there was a slightly recessed surface, bearing traces of use wear, while the edge of the item itself was slightly convex. The artefact was discovered within an alleged burial ground at sand mine in Majdan Górny, next to pottery vessels from the younger phase of the Early Iron age, but there is no certainty whether in this case we are dealing with a closed assemblage. It is also difficult to assess conclusively the purpose of this artefact. The tablet could have been used for polishing surfaces of various items, sharpening items made of metal and bone, or it could have been used as a tablet for grinding pigments. A distant resemblance might associate this item with stone bowls that were included among the grave goods in mound burials of the West Podolian group of the Scythian culture. The presence of bowls and various stone tablets in the sepulchral and settlement inventories of this group was already pointed out by Tadeusz Sulimirski, who mentioned their unclear purpose (1936, 17–18). In the newer studies the fact is emphasised that these artefacts occurred in all agricultural groups of the Scythian culture that inhabited the forest steppe zone, where they had been constituents of grave

⁹ The polishing tablet was encountered in the sector where a few cinerary urns were present, therefore, it can be assumed that this item took part in the proceedings of one of the burials.

goods in female burials during the 6th c. BC (Il'inskaja 1968, 150). Also extremely interesting and varied interpretations of the purpose of these items have been proposed — from toilet accessories for women used in beauty treatments of face painting (*ibidem*, 151), to portable altars, used for performing rituals of fire and blood (Petrenko 1967, 36).

None of the whetstones that were found in the Lublin region, has been discovered in its original shape. Moreover, none of these tools was undeniably recorded within the Lusatian culture context. A strongly worn out specimen was discovered in the layer between burials at the cemetery in Wołkowiany (Fig. 8:1), and from the surface of an alleged settlement in Koczów comes a tongue-shaped end of such a tool (Fig. 8:2). Two elongated whetstones are particularly noteworthy. One of them bears the traces of hole drilling, and it comes from a multicultural dune settlement in Sobibór (Fig. 8:3), while the second, discovered as a stray find on fields of Hrebenne near Lubicza Królewska was made of fine-grained stone (probably sandstone). In the case of the latter next to worn out edges of the hole there were traces of the oxidised bronze (Fig. 8:4). Such slender whetstones with holes were a common component of the inventory of warriors of Eurasian origin (Cimmerians and Scythians)¹⁰, and were used by them for sharpening weapons¹¹. Such items were deposited primarily in male burials (Bukowski 1977, 152), in which they usually bore no traces of use (Terenozhkin 1976, 94, 146). These tools, uniform when it comes to their shape, were often found within vast Eastern and Central European territories, both during the pre-Scythian period (cf. Terenozhkin 1961, 88, Fig. 57:3,4; 1976, 146, Fig. 58 and others; Kovnanenko 1967, 40, 137, Fig. 16:15; Krushel'nic'ka 1998, 172, Fig. 105:1–3; Metzner-Nebelsick 2002, 398–402)¹², as well as in the times of development, flourishing, and impact of the Scythian culture (cf. Il'inskaja 1968, 61; Chochorowski 1985, 84, plate 24:A1). Their functional qualities ensured that they were made and used for a few centuries (cf. Burghardt 2012). Most probably they were worn at the waist, as evidenced by both their particular deposition in the burials and by the depictions on stone stelae (Terenozhkin 1976, 94, 118, 146, Fig. 4I; 4II; 5:4; 6:2; 73:1). The whetstone from Hrebenne was probably hung on a bronze wire (ring?) or set in bronze, the green tarnish from which preserved on the surface. Spatially the nearest counterparts of this item are recorded among the Wysocko culture in western Ukraine¹³, where they supposedly were present in significant number at the cemeteries in Wysocko (Висоцьке) and Czechy (Цюгове) (Sulimirski 1931, 140–141, 191, plate XXIV:6; XXVI:20), as well as among the West Podolian group of the Scythian culture (same author 1936, 22, plate V1:e,f;

¹⁰ Cf. Chochorowski 1993, 137.

¹¹ Dating of these tools is correlated with the emergence of iron knives and edged weapons (Il'inskaja 1968, 161).

¹² A.I. Terenozhkin claims that analogous whetstones appeared together with the spread of iron in the late Timber-Grave culture (Terenozhkin 1976, 146).

¹³ Finds from the Polish lands, both the whetstone set in gold belonging to the spectacular assemblage from Witaszkowo (Bukowski 1977, 152–153, plate XXXII:1), and the specimen from the stronghold in Sobiejuchy (Harding, Ostoja-Zagórski, Palmer, Rackham 2004, 64, plate 33:9), are spatially more distant.

Smirnova 1998, plate 12:I1). The whetstone from Hrebenne might come from the end of the Bronze age as well as from the Early Iron age, and the more unambiguous conclusions in this regard are not possible due to the contextless nature of the find. Similar doubts arise regarding the whetstone from Wołkowiany. However, it cannot be ruled out (only in the case of actual belonging of this item to the relic space of the cemetery) that this in fact is an older artefact that comes from the younger phase of the Bronze age¹⁴.

It is believed that one part casting mould made from limestone and preserved in a small fragment, which had been discovered between the burials at the cemetery of the Lusatian culture population in Siedliszcze, had been intended for the production of knives or sickles, possibly pins. However, as it was determined through a specialised analysis, it has never been used in accordance with the intended purpose (Dąbrowski 1969, 85, 87, Fig. 1:2; 2006, 287–288). The preserved negative suggests that the item, which was to be made in the form, would be characterized by a thickened back, and this thickening would reach down to the tip of the blade. Such design is typical of knives and sickles of various types that are recorded within Lusatian culture sites on Polish territory (cf. Gedl 1984, plate 1:10; 7:52 and others; 1995, plate 3:37–39; 4:53; 6:89–94 and others). The discussed item can be compared to relatively numerous stone forms for the production of sickles, which are known from the Lusatian culture assemblages, in particular in Silesia (Gediga 1982, Fig. 8,9,18; Gedl 1982, Fig. 13, 18, 20; 1995, plate 46A). Having in mind the circumstances of the discovery, i.e. the area of the cemetery, it should be reflected in the context of peculiar for this culture sepulchral finds, i.e. the burials of metal founders (cf. Malinowski 1982).

A limestone disc from Gródek, site 1C (Niedźwiedź 1994, 10, Fig. 1:1) is probably an amulet. It was discovered between burnt bones in a bi-ritual (?) burial, which recently has been considered to be an alleged sepulchral feature of the Wysocko culture population (Kłosińska 2005a, 172). Discs or stones of other shapes with a hole for suspension are sometimes discovered in burials of the Lusatian culture, and they are clearly associated with a cult function (Kostrzewska 1953, 248–249). These pendants could have offered protection against evil, as was the case in many primitive cultures (Woźny 2011, 47). In the area of Upper Silesia item analogous to the find discussed here occurred in the grave dated to the 5th phase of the Bronze age (Gedl 1984, 53, plate 33D:2). Specimens of similar shape, made from flint, sandstone, and slate appeared also at sepulchral sites in Central Poland (Kostrzewska 1953, pp. 222–223, 248, Fig. 15:3,5,9), Lesser Poland (Durczewski 1939–1946, 129; 1948, 106, plate XCVII:23; Oleszczak, Twardowski 2011, 100, plate XLII:f), and Silesia (Madera 2002, 170). In the Lusatian culture milieu on Polish territory these rare artefacts are found in the assemblages from the younger stages of the Bronze age and the Early Iron age.

¹⁴ In the Lusatian Culture of the Bronze age whetstones could have been used not only to sharpen edges, but also to work the surface of items made of wood, bone, and antler (Kaczmarek 2002, 119). The tool from Wołkowiany also refers to the polygonal stone whetstones that were discovered, among others, at the stronghold of the Lusatian culture in Biskupin (Maciejewski 1950, 107–108, Fig. 8).

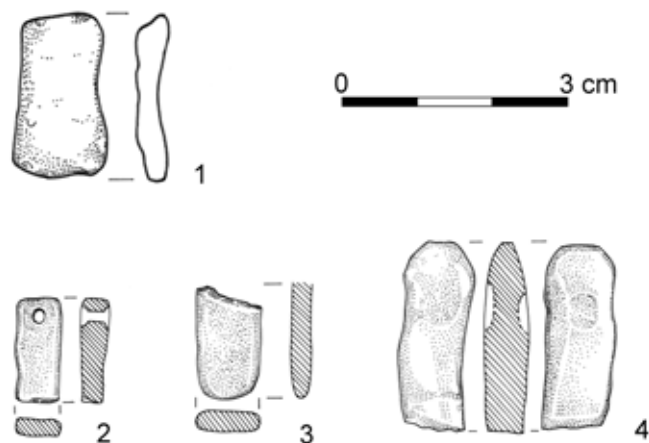


Fig. 8. Discoveries of stone tools from the areas of cemeteries, settlements, and discovered without context: Wołkowiany, Chełm district, site 3: a whetstone – 1. Drawn by W. Misiewicz, redrawn by T. Demidziuk; Koczów, Chełm district, site 8: a fragment of a whetstone – 2. Drawn from life by E.M. Kłosińska, redrawn by T. Demidziuk; Sobibór, Włodawa district, site 1: a semi-finished whetstone – 3. According to Telepko 1986; Hrebenne, Tomaszów Lubelski district: a fragment of a whetstone – 4. Drawn from life by E.M. Kłosińska, redrawn by T. Demidziuk

Ryc. 8. Odkrycia kamiennych narzędzi z terenów cmentarzyisk i osad oraz znaleziska luźne: Wołkowiany, pow. chełmski, stan. 3: oselka – 1. Rys. W. Misiewicz, przerys. T. Demidziuk; Koczów, pow. chełmski, stan. 8: fragment oselki – 2. Rys. E.M. Kłosińska, przerys. T. Demidziuk; Sobibór, pow. włodawski, stan. 1: półprodukt oselki – 3. Wg Telepko 1986; Hrebenne, pow. tomaszowski: fragment oselki – 4. Rys. E.M. Kłosińska, przerys. owane przez T. Demidziuk

A stone ball discovered in a residential feature from the younger stage of the Early Iron age in Teptiuków, site 6, is undoubtedly one of the numerous similar to it artefacts that are considered to be tools, more precisely polishing stones (Mogielnicka-Urban 1984, 23; further literature there), which were used by the population of the Lusatian culture in household production. A relatively large number of spherical or oval, flattish pebbles comes from strongholds of the Biskupin type (Maciejewski 1950, 108; Harding, Ostojka-Zagórski, Palmer, Rackham 2004, Pl. 34:1–8), and due to the fact that very often they were found within burials, they are referred to as substitutes for food, the so-called cheeses, eggs, swallow breads, and *gomółka* (Polish for a chunk of a soft pulp of spherical or oval shape – translator's note) (Kostrzewska 1953, 238; Gardawski 1979, 268; Woźny 2011, 44). It is believed that they have been used in pottery production at the final stage of pottery treatment, or for tanning hides (cf. Kaczmarek 2002, 221–222; Kłosińska 2017, 35, Fig. 11).

At the end, it is worth mentioning that fossils constitute a peculiar category of stone materials, which were used by the Lusatian culture population in the funerary practices. A few belemnites were encountered in cinerary urns among the bones, at the cremation cemetery in Perespa. It is thought that they acted as the so-called thunderstones, i.e. items of a symbolic nature (Kłosińska 2012, 150).

When the prehistoric inhabitants of the Lublin region (including the Lusatian culture population) needed to produce a useful flint item they had a relatively easy access to the sources of this raw material. Not only flint was present, in various intensity, on the ground surface, but in a few places within the area in question and at a short distance beyond its limits there were outcrops of siliceous rocks.

Baltic flint, also known as Cretaceous erratic flint, despite being among the raw materials with the worst properties, due to its availability was among the most frequently used ones. It appeared with various intensity within the lands that had been affected by glaciation (Balcer 1983, 49). In the Lublin region the greatest concentration of this raw material was in the vicinity of Włodawa, Włodawa district (Lech 1983, Fig. 1). The mediocre quality of this raw material was determined by its deposition at the ground surface and prolonged transportation during glaciation (Cyrek 1983, 107). Its natural condition and defects, for instance, internal cracking, tearing or lack of cortex forced on the population attempting to utilise it the necessity of raw material selection. Despite these difficulties, in assemblages and within occupational layers at the Lusatian culture settlements in the discussed area, Baltic flint was often present. This is exemplified by the settlements, for example, in Chlewiska, Szczekarków, and Giżyce, as well as the cemetery in Siedliszcze, where erratic flint represented 100% or almost 100% of the raw material out of which products and semi-finished products had been made. In the Lublin region this flint was used for the production of tools of small dimensions. It was also chosen for making sickle-shaped, bifacially retouched inserts. In the case of bigger items with similar type of retouch, such as sickle-shaped knives, raw material of better quality was used.

Siliceous rocks within the Chełm Hills have definitely better properties. Rejowiec flint, the outcrops and traces of prehistoric exploitation of which have begun to be identified relatively recently within the discussed territory, is similar to Volhynian raw materials (Libera 2003, 19). It appeared in the form of nodules or small concretions on the surface of slopes and culminations of hilltops and hummocks, always within sandy-clayish materials (*ibidem*, pp. 20, 21). This raw material was used primarily by the population living in the nearest territory of Polesie, and its good quality allowed for obtaining larger forms such as bifacial point from the settlement feature in Zagroda dated to the Early Iron age.

Further rich deposits of siliceous rocks and places of their procurement and processing are known since the 1920s from the Vistula river area of the Lublin region. Grey Turonian flints exists in a few varieties, out of which in particular two – Świeciechów (white spotted) and Gościeradów (speckled) were used by the population of the Lusatian culture (Libera, Zakościelna 1987, 39, 46). These raw materials are characterised by excellent cleavage, which allowed obtaining large products (e.g. sickle-shaped knives), which, however, went blunt faster and thus required subsequent retouching¹⁵. Probably also because of the damages there was the need to produce brand new tools. At this stage of the research on the flint materials obtained from the mentioned area it can be concluded that the Lusatian Culture

population exploited mainly Gościeradów flint, even though its quality is inferior when compared with the Świeciechów flint (Libera, Zakościelna 1987, 45, 46).

Additionally, in the Lusatian culture assemblages on the eastern fringes of the Lublin region the use of Volhynian flint was observed. Taking into account the outstanding technological properties of this flint and also its visual qualities (cf. Balcer 1983, 50), it could be assumed that it attracted widespread interest. However, its presence in closed assemblages, or within a broader context of the Lusatian culture sites, remains at mediocre level. Products and semi-finished products made from Volhynian flint were recorded in small quantities both at the sites from the beginnings (Hrubieszów-Podgórze, Podlodów, Pokrówka) and from the final stages (Sitaniec-Wolica) of this culture. These were small artefacts such as flakes and splintered pieces, and single larger core specimens, as sickle-shaped knives. Although the issue has not been adequately investigated yet, it seems that in times of the Lusatian culture the import of siliceous rocks from Volhynia was non-existent. The artefacts mentioned were most likely made from “assimilated flint”, i.e. from older (e.g. Neolithic) products made from Volhynian flint. Apparently, the amount that was found was sufficient for the local needs. Moreover, also other good quality raw materials, such as chocolate flint from beyond the west bank of the Vistula river, were not imported.

There is evidence that in the Lublin region flint processing took place in two different environments: in the homestead workshops at settlements and in specialised workshops located at the mining fields or in the immediate vicinity thereof, outside the residential quarters. In the first case the production took place within a homestead, in the residential dwelling or the vicinity thereof. This is demonstrated by numerous finds of production waste found both in closed assemblages and within occupational layers. Pit 7 at the Early Iron age settlement in Chlewiska should be considered to be this kind of a homestead flint workshop (Gajewski 1962). In this feature erratic flint was processed, as evidenced by the presence of the core and a dozen or so pieces of flint waste. Numerous artefacts within occupational layers at small settlements in Szczekarków (Gajewski 1964), Giżyce (Rejniewicz with the team 2004) and Bykowszczyzna (Rejniewicz 2009) exemplify flintknapping production within residential area. In the homestead workshops usually simple products of small size were produced, mainly flakes. Production of such items did not require high skills. The raw material was obtained from the ground surface in the close vicinity, both in the form of concretions and products from bygone times intended for assimilation. The process of flintknapping performed within a homestead at a settlement could have been of continuous nature and could have taken place not only during the summer months but also in winter, provided that there was sufficient stock of raw material. It can be assumed that the pool of flint implements used in daily life required continuous renewal.

On the other hand, specialized flintknapping workshops were established at the outcrops of this raw material. Localizing and exploiting such places required from prehistoric communities (including the population of the Lusatian Culture) some geological knowledge as well as practical skills (cf. Lech, Lech 1997, 110). It seems that the knowledge about the existence of raw material sources resulted from the long tradition of

¹⁵ Information provided by Professor Jerzy Libera, PhD. Similar conclusions regarding the usage of the grey flint in the Neolithic was also expressed by Bogdan Balcer (1983, 50).

their exploitation. The on-the-mining-field workshops existed in place of occurrence of Rejowiec flint in the Chełm Hills. It is believed that their users resided in camps, producing on-site both semi-finished and finished products (cf. Liber 2003, 24). At the present stage of the research it can be determined that these features were used only for short periods of time (on ad hoc basis), as evidenced by complete lack of pottery. Probably the exploitation of Rejowiec flint would not take place throughout the year and only during the summer months. Meanwhile, the places where this population resided were located in the valleys of rivers draining this terrain, which is confirmed by the map depicting distribution of the sites (Kłosińska 2008, Fig. 1).

In the Vistula river area of the Lublin region, near the outcrops of grey Turonian flints there existed workshops located in the immediate vicinity of the mining fields used by the Lusatian Culture population. It is believed that the sites of this culture from the turn of the Bronze Age and the Early Iron owe their origins to these particular flint deposits (Libera, Zakościelna 2002, 105). However, the evaluation of the inventories from these sites leads to the suggestion that the apogee of inhabitation took place during the younger stage of the Early Iron age (cf. Kłosińska 2005b, *passim*). Moreover, it should not be associated exclusively with the Tarnobrzeg group as it has been done until now (cf. Bargieł 2002, 135), as also the population of the Lublin group had access to the deposits, which is confirmed by the spread of characteristic flint products downstream the Vistula river and along its right bank tributaries, for instance, the sickle-shaped knives from the settlement in Opoka by the Kurówka river – Libera 2001, and the flakes and cores from the features at the settlement in Chlewiska upon the middle Wieprz river – Gajewski 1961; 1962). The flint was acquired probably from the ground surface, from within the rubble layer, as evidenced by the quality of the raw material, which had removed cortex and worn surfaces¹⁶. Until now, neither the exploitation using extraction pits, nor the use of mining tools has been confirmed. However, it should not be excluded that some kind of wood or bone hoes were used to ease the work. It is thought that the flint processing was done on the spot, which is indicated by the significant number of flakes and cores in various stages of exploitation (Bargieł, Gurba 1986, 32). The presence of the significant quantity of finished products and rough outs of certain core artefacts at the workshops in the immediate vicinity of mining fields in the Vistula river area (Bargieł, Libera 1995, 16), seems to suggest that the craftsmen working here prepared “goods” for further processing and distribution. Some of the products from these workshops are characterised by significant technological advancement and reflect high flintknapping skills. This also indicates the existence of specialisation in this respect. At site 4 in Kopiec interesting traces of the production process were observed. They consisted of circular or ellipsoid concentrations containing a great number flint artefacts (Florek, Libera 1994, 5). These concentrations might represent the exact spots, in which the specialist had processed flint.

Similarly as in the case of the workshops within the range of the Chełm Hills, within the area immediately adjacent to the

deposits of grey flints in the Vistula river area, there are no traces of permanent settlement of the Lusatian Culture population (cf. Libera, Zakościelna 1987, 45). Moreover, the presence of settlement features within the range of the workshops in the immediate vicinity of mining field has not been observed either. However, the scale of the local production allows to believe that this process required certain amount of time and, therefore, also necessitated building of ad hoc shelters for the craftsmen.

It seems that mainly populations inhabiting permanent settlements located at a certain distance from the deposits and areas of flint exploitation benefited from the abundance of this raw material. Hence, this raw material was used for the production of bifacially retouched weapons at the settlement from the Early Iron age in the village of Zagroda upon the Uherka river, located at the distance of about 10 km from the recently discovered outcrops of Rejowiec flint in the Chełm Hills (cf. Libera 2006a, Fig. 5). The use of grey Turonian flints within the Vistula river area of the Lublin region, in the valley of the Vistula river and its tributaries, is attested by the discoveries within the settlements located at the distance within the range of approximately 2–30 km away from the mining fields and deposits of this raw material. The closest located settlements, whose inhabitants used the local raw material, were in Świeciechów Duży, sites 3 and 6, Kosin, site 10, and a little further away – in Wólka Szczeczka, site 9 and Potoczek, site 4. The local flint, as semi-finished products and products, entered also into the Lusatian culture cemeteries in the Vistula river area dated to the Early Iron age, as evidenced by finds from Opoczka Mała (Libera 2008). It most likely was used in local funerary practices.

As demonstrated earlier, the pool of flint artefacts attributed to the Lusatian culture population in the Lublin region was rich and relatively diverse both formally and functionally. The items were made that were used for cutting, piercing and drilling, engraving, scraping and scratching, puncturing, and other activities of daily life, which we are not able to identify today. The flint artefacts were of substantial usefulness in harvesting cereals and herbaceous plants (“single-piece” and “composite” sickle blades), hunting (spearheads and arrowheads), woodworking, and bone and animal hides processing. Due to their sharp edges flint tools were probably also used in hygienic and medical treatments, and during the Early Iron age, when the “fashion” appeared for deeply engraved, narrow ornaments, they were used to etch these ornaments on the surface pottery vessels and bronze ornaments. Flint raw material, besides clay and wood, was undoubtedly dominant in the production of the Lusatian culture. Usable items, often overlooked by researchers, were made out of it in significant numbers, and older products, i.e. from the Early Bronze age or even Neolithic (cf. Dąbrowski 1982, 266; 1996, 177; 2009, 204), were assimilated and reused. In need, flint was used in the production of weapons such as: spearheads, arrowheads (probably more numerous than it is confirmed by the material sources), and clubs¹⁷. When it comes

¹⁶ Information provided by Professor Jerzy Libera.

¹⁷ Jan Dąbrowski put forth a very interesting assumption regarding the production and use of such weapons (1996, 179; 2009, 204) by comparing the clubs to the so-called “nasięki” described by researchers of the ancient culture. Flints were driven into young birch trees or oaks and after the structure of the wood grew around them the club was made.

to functionality, the tools and weapons made from this raw material were not inferior when compared with those made from bronze, and often they even outperformed them (same author 2012, 88).

The mean of obtaining semi-finished products was not very sophisticated. Clactonian method implementing the hard hammer technique dominated strongly. By means of this method macrolithic pseudo-blades were obtained as well as flakes of various sizes. Irregular cores were used for core reduction, and the orientation of the core was repeatedly changed throughout the process. Semi-finished products were obtained not only from core processing, as also natural chunks of flint of varying size were selected for tools production (Libera 2006b). The fact of limited use of counter shock core reduction technique that had been more commonly implemented during the Bronze age outside the Lublin region (cf. Waluś, Manasterski 1999, 211) is puzzling. This can probably be explained by the state of research, as the Lusatian culture settlement materials of that time, in which flint artefacts usually occur, are very poorly investigated in the region discussed here. Therefore, considering the available material sources, we can talk about the predominance of the Clactonian method in the Lusatian culture flintknapping only in regard to the Early Iron age.

In the Lublin region among the fundamental tool forms of the Lusatian culture population one should include: retouched pseudo-blades, flakes and chunks, as well as knife-shaped tools and notched tools, knives of the Zele type, sidescrapers, and backed inserts. Also the presence of endscrapers, burins, perforators, and borers was recorded. The sickle-shaped inserts and knives are among the leading core forms, while finds of bifacial points are rare (Libera 2006b). Undoubtedly, sickle-shaped knives and various arrowheads with carefully retouched surfaces are the most spectacular flint products from the discussed area. It is worth to pay particular attention to them, especially in the context of the interesting observation that some of them could have been imitation of bronze artefacts. The sickle specimens from the settlement in Opoka, made from Świeciechów flint, slender and in the shape resembling a crescent, clearly refer to the bronze sickles with the straight base, i.e. items common among the cultures of the Urnfield milieu during the Bronze Age. Similarly, the flint tanged arrowheads should be regarded as imitations of bronze or bone originals. Among others, the specimen from the settlement in Lubartów exemplifies a particularly successful imitation. While when it comes to the core tools, the scope of the use of axes is rather poorly investigated. They could have included ones with oval and lenticular section; the latter were functioning within cemeteries as “assimilated” items originating from earlier periods.

In the environment of the Lusatian Culture in the Lublin Region high skills of tool retouching are clearly noticeable. This is particularly attested by surface retouch used on the surface of core forms, for example, sickle-shaped knives and inserts, as well as on some of the arrowheads. Also notched retouch, blunting retouch (“truncation of backs”), and characteristic pseudo-burin removal used for forming bases of the sickle-shaped knives were implemented (Libera 2006b).

As the conclusions to the above remarks, it must be stated that for the Lusatian culture population of the Lublin region siliceous rocks were an important raw material for

the production of tools and weapons. The range of items is quite wide and it significantly differs not only from the forms developed in the Younger Stone age, but it also displays a certain dissimilarity when compared with the artefacts representing flintknapping of the initial stages of the Bronze age (cf. Libera 2006b). Especially, the technical heterogeneity is noteworthy. Undoubtedly, high flintknapping skills were not as prevalent among the population of this culture as previously among the representatives of both the Stone ages (cf. Lech, Lech 1997, 111). As rightly noted by Jacek Lech (...) *flint was begun to be used in other ways* (1997, 344). The two seemingly parallel trajectories of the flintknapping of the time can clearly be seen: lowering of the common skills in the homestead production and high flintknapping proficiency and knowledge displayed by the individuals at places where this raw material was present (*ibidem*; cf. also Dąbrowski 2009, 204). Strikingly, in the Lublin region during the discussed here period, this situation is reflected in another field of production, namely in metallurgy, where besides the simple items of homestead production (cf. the discovery of the so-called hearth of the founder at the settlement in Wronowice), there are highly advanced artefacts made by specialists who possessed both the resources and the skills. It is also worth noting that specialist centres for the extraction and processing of flint that existed within the Vistula river area, in the Early Iron age were located on the Vistula river transport route of considerable importance, and thus they could have taken part in the long-distance exchange. This conclusion probably opens a new perspective in the research on the spread of the grey flints on wider territories.

The nature of the stone raw material, from which particular, larger artefacts belonging to or associated with the Lusatian culture were made, was usually not specified by the discoverers. It is not known what kind of stones exactly was used for the production of axes. Hard and resistant to cracking stones were best suited for this purpose (Dąbrowski 2009, 205). This probably could have been granite, as the statistics show that in the Polish lands the Lusatian culture population favoured this type of raw material (Dobrzyński 2008, Fig. 19). The barrel-shaped hammer from Malinówka was made from stratified grey stone of unknown kind, while the mace from Krasnystaw – from fine-grained granite. This type of stone was also used for making querns and handstones, while whetstones and polishing tablets were made from sandstone. In the Lublin region there are no bedrocks that could have been used for this type of production and only erratic stones of glacial origin were at the disposal. However, the raw material of such origin, relatively easily accessible on the ground surface, especially in the northern part of the Lublin region, undoubtedly required to be subject to a selection process due to its varied quality. It can be assumed that, as in the Neolithic, the producers of stone items used to the maximum the structural characteristics of stone material and also paid attention to its specific weight, which, even in the case of small tools, increased the impact force (cf. Prinke 1983, 132, 134). Stones with elongated shape and appropriate “surplus” of the raw material were chosen for the production of axes. This “surplus” was then removed. It is thought that the core reduction technique was applied for this purpose (Dobrzyński 2008, 53) with the attention being paid to the cleavage planes of the stone so that the cutting blade of the intended tool to be set perpendicularly to them,

as this also increased the resistance to mechanical deformation of the final product (Prinke 1983, 134–135). Then the item was polished using stones with good abrasive properties, for example sandstones or, less commonly, granites with various grain sizes (Dobrzyński 2008, 53–54), or even sand (Dąbrowski 2009, 205). However, before the product was polished the hole had been made using the so-called bow drill, known already from the Neolithic, equipped with a bone core drill under which wet sand was thrown (cf. Wojciechowski 1973, 54–55). This was very tedious and time consuming process, the drills required frequent changing, and core drilling to the depth of one millimetre required a few hours of work, as shown by the experiments (Dąbrowski 2009, 205). In a similar manner the stone mace could have been processed, while the abrasive surfaces of handstones and querns were formed and reshaped in the course of their use. Thanks to the soft structure of the sandstone the holes in the whetstones were “pricked” or “scooped out”. The only known until now lasting casting mould from the Lublin region was found within the burial ground in Siedliszcze. It had been made out of soft limestone (Dąbrowski 1969, 85). Making of this type of metallurgical accessories required a lot of workload and precision (J. Dąbrowski 2009, 205). The raw material from which this item was formed could have been locally sourced.

The process of creating a stone item was difficult and time-consuming, and it required relevant skills and experience. Already the selection of the raw material was based on the knowledge of the producer that was founded on long-standing

tradition (Fogel 1981, 171). The existence of specialization possessed only by certain craftsmen involved in processing stone raw materials cannot be ruled out. The discovery of the drilling core from a stone axe within the specialized flint processing workshop in Kopiec, site 4 (Florek, Libera 1994, 9), proves that the scope of the skills of the craftsmen using this workshop was wider and, if necessary, they could have shifted to the production of stone tools at this site. The stone tools production process could have been carried out not only in such workshops, but, considering the time needed for completion of such a task, above all, within settlements themselves. At the same time, we cannot rule out the possibility that already preliminarily processed erratic stones were brought to settlements to avoid transporting unnecessary loads. Unambiguous assessment of the purpose of stone axes is difficult, as they could have been either used in households or could have been intended for exchange (as tools or insignia). Among others, they could have been used in construction works, for example, for debarking, hewing, and driving wooden post into ground, they also could have been useful for slaughter of animals (Węgrzynowicz 1973, 20–21). It is also believed that pentagonal axes were the attributes of authority or accessories associated with cult (Nosek 1957, 106). It is also worth noting that in the Lublin region the phenomenon of the relatively frequent occurrence of stone axes outside the context of compact settlement zones suggests that these tools could have been used for work in forest, for felling of trees and for work at grubbing spots. Therefore, the role of the stone axes remains ambiguous.

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Elżbieta Małgorzata Kłosińska

Przyczynek do badań nad wykorzystaniem krzemienia i kamienia przez ludność kultury łużyckiej na Lubelszczyźnie w epoce brązu i wczesnej epoce żelaza (uwagi niespecjalisty)

Streszczenie

Przedmioty z krzemienia i kamienia, pełniące zazwyczaj różnicowane funkcje narzędziowe, należą na Lubelszczyźnie do stosunkowo częstych znalezisk, ale ich reprezentacja w zespołach jest bardzo ograniczona. Zabytki te oraz większość niewyspecjalizowanych wytworów krzemienianych notowanych na osadach miały szerokie zastosowanie i często zapew-

ne wykorzystywane były do rozmaitych czynności, związanych z obróbką różnych surowców (gliny, drewna, kości, skór, itp.). Wątpliwości nie budzi przeznaczenie żniwne niektórych krzemienianych form z retuszem bifacjalnym i użytkowanie podobnie opracowanych wyrobów jako militariów (płaszcz, grociki), a podstawową funkcję kamiennych toporków

wiąże się z obronnością, ale też z uprawą roli, wycinką drzew i ciesiołką, natomiast kamiennych żaren i rozcieraczy – z obróbką ziarna. Jasną dziś dla nas funkcję odzwierciedlają także kamienne osełki i formy odlewnicze. Użytkowa rola narzędzi krzemiennych i kamiennych zyskiwała jednak inny wymiar na cmentarzyskach, gdzie przedmioty te nabierały nowych, symbolicznych treści. Trudna do jednoznacznego oszacowania jest natomiast liczba przedmiotów, będących uzbrojeniem, czy też atrybutami prestiżu. O insygnialnej roli zabytku kamiennego można mówić chyba tylko w przypadku jedynego egzemplarza buławy, choć nie należy wykluczać, że taką funkcję pełniły również topory, młoty oraz niektóre, duże wyroby krzemienne o wyretuszowanych powierzchniach.

Z zespołów kultury łużyckiej na Lubelszczyźnie pochodziły zatem różne wytwory i półwytwory krzemienne oraz artefakty kamienne. Wymienić wśród nich można m.in. rdzenie, odłupki, grociki sercowate i grociki z trzonkiem, noże sierpowate, wkładki sierpowate, płaszcz, topory, żarna, rozcieracze, osełki i inne.

Poczynione ostatnimi laty odkrycia niezwykle bogatych inwentarzy krzemiennych na terenie Powiśla Lubelskiego (Kosin, pow. kraśnicki, stan. 10, Kopiec, stan. 4 i 8), stały się podstawą do istotnych ustaleń morfologicznych i określenia najważniejszych cech krzemieniarstwa ludności kultury łużyckiej w tej części Lubelszczyzny, zdefiniowanego pod nazwą „przemysłu kosińskiego”. W świetle nowych znalezisk, zjawisko ukryte pod tym pojęciem, utożsamiane do niedawna jedynie z łużycką kulturą tarnobrzeską nad Wisłą i Sanem, ma znacznie szerszy zasięg i odnosi się do łużyckiej wytwórczości krzemieniarstwa na rozleglejszych terytoriach, wykraczając poza Lubelszczyznę. Na wymienionych wyżej stanowiskach, w oparciu o miejscowe złoża surowca świeciechowskiego i gościeradowskiego, we wczesnej epoce żelaza powstawały liczne półwytwory i wytwory krzemienne. Znaleziska te zostały już opracowane i wprowadzone do obiegu naukowego.

Inne pracownie nakopalniane zlokalizowane na terenie Pagórów Chełmskich, pracujące w oparciu o miejscowy krzemień rejowiecki, również wykorzystywane były przez ludność kultury łużyckiej.

Artefakty krzemienne były również licznie obecne na cmentarzyskach kultury łużyckiej Lubelszczyzny. Występowały one zarówno w przestrzeni cmentarzysk, jak i w samych popielnicach i odnosiły się do kultury symbolicznej, użytkującej te cmentarzyska ludności.

Niestety, niemal wszystkie znaleziska toporków kamiennych z Lubelszczyzny, które można by powiązać z kulturą łużycką, nie posiadały żadnego kontekstu, potwierdzającego taką atrybucję. Podobną uwagę można odnieść do znalezisk młotów kamiennych. Zwraca uwagę jeden z bezkontekstowych okazów z powiatu chełmskiego. Młot z Malinówki łączyć trzeba z szeroko pojętym, wschodnioeuropejskim środowiskiem kulturowym okresu przedscytyjskiego. Walcowate lub beczułkowate kamienne młoty, zaliczane do kategorii akcesoriów bojowych, stosunkowo często pojawiały się w zespołach kimmeryjskich na terytoriach stepowych na północ od Morza Czarnego. Wykonywano je z twardych skał, a powierzchnię starannie szlifowano. Ze wschodnim *milieu* bez wątplenia trzeba także wiązać znaleziska osełek kamiennych oraz płytkę kamienną.

Wśród artefaktów kamiennych z czasów kultury łużyckiej na Lubelszczyźnie znalazły się także buława, żarna i rozcieracze, płyty szlifierskie, forma odlewnicza, amulet i gładzik.

Pradziejowi mieszkańcy Lubelszczyzny (a w tym ludność kultury łużyckiej), chcąc wykonać użyteczny przedmiot krzemienny, mieli stosunkowo łatwy dostęp do źródeł surowca. Krzemień był nie tylko w różnym natężeniu obecny na powierzchni gruntu, bowiem w kilku miejscach na wskazanym terytorium, a także w niewielkiej odległości poza jego granicami, znajdowały się wschodnie skały krzemionkowych.

Do surowców o najniższych walorach użytkowych, a mimo to najczęściej wykorzystywanych – z racji znacznej dostępności, należał krzemień bałtycki, znany również jako krzemień kredowy narzutowy. Zdecydowanie lepsze parametry użytkowe posiadały skały krzemionkowe na terenie Pagórów Chełmskich. Krzemień rejowiecki, którego wschodnie oraz ślady pradziejowej eksploatacji zaczęto lokalizować na tym terytorium od stosunkowo niedawna, był zbliżony do surowców wołyńskich. Kolejne, obfite złoża skał krzemionkowych i miejsca ich wydobycia oraz obróbki znane są na Powiślu Lubelskim. Krzemienie szare turońskie występują tu w kilku odmianach, z których zwłaszcza dwie – świeciechowska (biało nakrapiana) oraz gościeradowska (plamista) były użytkowane przez ludność kultury łużyckiej.

Istnieją dowody na to, że na Lubelszczyźnie obróbka krzemienia odbywała się w dwóch odmiennych środowiskach: w pracowniach domowych na osadach oraz w ośrodkach na lub przykopalnianych, poza obszarem bezpośredniego zamieszkania. W pierwszym przypadku odbywało się to w zasięgu obejścia, w budynku mieszkalnym lub też w jego sąsiedztwie, a dowodzą tego liczne relikty odpadów produkcyjnych, notowane zarówno w zespołach zwartych, jak i w warstwie kulturowej. W pracowniach domowych powstawały zazwyczaj formy proste, o niewielkich gabarytach, głównie odłupki, a ich wykonanie nie wymagało wysokich umiejętności. Surowiec był pozyskiwany z powierzchni gruntu, w najbliższej okolicy. Proces obróbki krzemienia w zasięgu obejścia mieszkalno-gospodarczego na osadzie mógł mieć charakter ciągły i odbywać się nie tylko w miesiącach letnich, ale także zimą, pod warunkiem posiadania zapasów surowca. Można przy tym założyć, że zasób przyborów krzemiennych wykorzystywanych w codziennym życiu wymagał ciągłej odnowy.

Wyspecjalizowane pracownie obróbki krzemienia powstawały natomiast w miejscach wschodni tego surowca. Zlokalizowanie i eksploataowanie takiego miejsca wymagało od społeczności pradziejowych (w tym ludności kultury łużyckiej) pewnej wiedzy geologicznej i praktycznych umiejętności. Wydaje się, że wiedza o istnieniu źródeł surowca wynikała z długotrwalej tradycji ich eksploatacji.

W konkluzji do powyższych uwag stwierdzić należy, że dla ludności kultury łużyckiej Lubelszczyzny skały krzemionkowe stanowiły ważne źródło do wyrobu narzędzi i broni. Widać wyraźnie dwie jak gdyby równoległe ścieżki ówczesnego krzemieniarstwa: obniżenie powszechnych umiejętności w dziedzinie wytwórczości domowej oraz wysoką krzemieniarzką biegłość i wiedzę, przejawianą przez jednostki w miejscach występowania złóż surowca. Sytuacja ta w uderzający sposób znajduje odzwierciedlenie w innej dziedzinie wytwórczości omawianych odcinków pradziejów na Lubelszczyźnie, a mianowicie w metalurgii, gdzie obok powstających sposobem domowym prostych wyrobów, pojawiały się wysoko zaawansowane przedmioty, wykonane przez specjalistów, dysponujących surowcem i umiejętnościami.

