

Workshops in the Immediate Vicinity of a Mining Field of Flint Sickle-Shaped Knives from the Foreland of the Outcrops of Świeciechów Flint

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Abstract: The studies on the sickle-shaped, bifacially formed knives showed that the crescent-like forms (with the maximum width around the middle of the specimen) found in Lesser Poland should be associated with the people of the Trzciniec and/or Lausatian culture. Some premises seem to indicate for the possibility of connecting the relatively narrow specimens with well-defined bases as well as those with base similar to distal tip with a straight or concave inner edge (the latter ones show similarities to crescent-like forms) with the 'Lausatian' culture settlements. In direct vicinity of Świeciechów flint deposits, at a place called Kopic, a workshop of bifacial forms was discovered, at which – in the context of the Lausatian culture pottery – around 70 crescent-like sickle-shaped knives in various stages of completion and state of preservation were found. At least 20 'pottery' sites of this culture are known from earlier and later verified surface surveys (Polish Archaeological Record). These sites are located within on the area of in direct vicinity of grey flint, i.e. Świeciechów and Gościeradów flint, outcrop.

Keywords: sickle-shaped knives, Świeciechów and Gościeradów flint, workshop, Lausatian culture, Kopic

The fieldwork, carried out during several research seasons in the 1980s, that concentrated within the Rachów and Gościeradów anticlines, Kraśnik district, anticlines rendered rather comprehensive (excluding forest complexes) identification of surface outcrops of grey siliceous rocks of the Turonian age, Cretaceous period with the following main types: grey white spotted (with light dots) called Świeciechów – most commonly known in the literature; grey speckled called Gościeradów – dominant; grey neither spotted nor speckled; black (blackish). Simultaneously, for the first time, abundant materials of prehistoric settlement both from the flint bearing fields and their direct hinterland were obtained (e.g. Libera and Zakościelna 2002). These data allowed to think about these outcrops of siliceous rocks from a different standpoint than the one based on the studies carried out in earlier years. This resulted in the recognition of the area of fields located to the south of the built-up area of Świeciechów Poduchowny, Kraśnik district, as an open-pit mine related mainly to the activities of Neolithic population of the Funnel Beaker culture (e.g. Balcer 1975). Excavations resumed in this area in 1990s confirmed previously indicated interest of the communities of the end of the Neolithic and the beginning of the Bronze age, both in the primary mining field – in the literature referred to as 'Świeciechów-Lasek', Kraśnik district (Balcer 1971), and outside thereof. As the outcome of the Polish Archaeological Record (AZP) project a new Świeciechów flint outcrop was discovered in the Nowy Rachów area, Kraśnik district. Within that outcrop a few fragments of sickle-shaped knives were found (Bargieł and Libera 1996, 2002). Additionally, the presence of a small enclave of grey white spotted flint within the

deposits of Gościeradów flint north of Wymysłów, Kraśnik district, was confirmed (Balcer 1975: Fig. 40; Libera and Zakościelna 2002: 98, Fig. 1).

Sites 4 and 8 in Kopic, Kraśnik district, are situated within the southern immediate foreland of mining field 'Świeciechów-Lasek'. They are located on sandy soils containing number of erratics of various sizes, natural concretions and chunks of Turonian flints, and in negligible amounts also flints of moraine origin, occasionally spherically rounded chunks of gneiss. These sandy soils cover Pleistocene terrace, currently having an inclination of ca. 1% to 3%, rising approximately 10m over the Holocene floodplain of the Vistula river (cf. Libera and Zakościelna 2002: Fig. 1, 2).

Kopic, site 4, Kraśnik district

The main works were carried out on site 4, which is located about 500m from the south fringe of the mining field. The site was discovered in 1992 during the AZP. Among exclusively flint artefacts found at the time there were several forms of roughouts (including 'sickle-shaped' ones). They point out to the existence of a Bronze age flint workshop there. Excavations undertaken in the following year (and continued in 1994) confirmed the existence of campsites related to working of siliceous rocks and basing on grey Turonian raw materials. Altogether, during those two seasons of research, nearly 24,400 flint artefacts, over 700 pottery sherds, less than 200 daub fragments and almost 50 very small bones, as well as 2 concentrations of duck mussel shells, and single artefacts made of non-siliceous rocks were found. In total a surface of 465m² was investigated

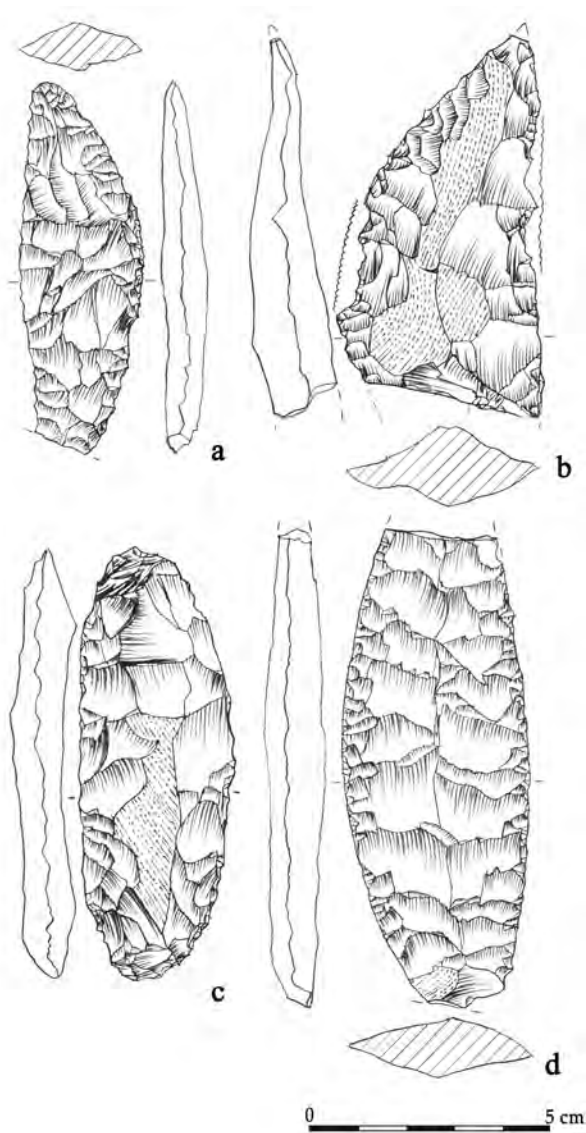


Fig. 1. Kopicz, Kraśnik dist., site 4. Selection of roughouts and semi-products of sickle-shaped knives. Drawn: J. Libera.

through archaeological excavations. All archaeological materials were within a cultural layer of a thickness of up to 70cm below the ground surface. Neither features nor other sunken structures were observed. Typological analysis of forms of distinctive flint materials showed that the site in question had two phases of existence.¹

The oldest phase is associated with the Final Palaeolithic. Scattered artefacts registered within the space of almost 170m² revealed forms typical of the Świderian culture. Within the inventory of almost 50 tools the following were identified: burins (19 pieces) – dominated by dihedral specimens, endscrapers (15 pieces) – mostly on blades, willow leaf points (11 pieces)

¹ Furthermore, a few pottery sherds dated to the Early Middle ages were found.

– mainly Świderian points; also perforators (3 pieces), truncated blades (2 pieces), and a single borer and tranchet were found; as well as accompanying debitage in the form of burin spalls (6 pieces). Additionally, nearly 150 core forms were discovered that include: precores and cores – including almost 100 specimens of the Mazovian type. They are supplemented by a set of technical forms – crested blades and secondary crested blades (near 440 pieces) and overpassed blades (near 100 pieces). Blade debitage is very numerous (more than 3000 pieces), evidencing, for example, the usage of double platform reduction (cf. Florek and Libera 1994; Bargieł and Libera 1995; also Krzemiński 2004).

The younger phase is represented by prehistoric pottery products – all of them belong to the Lusatian culture. In this group fragments of the following forms were recognized: egg-shaped pots with rims decorated with row (rows) of holes or ornamentation made with finger-nail impressions, fragment of a band handle, clay spindle whorl and partially preserved plate-disc.

Stylistic analysis of these fragmented artefacts indicates their correlation to the materials associated with III development phase of the Tarnobrzeg group, as distinguished by Kazimierz Moskwa (1976: 86–87) – dated to the Hallstatt C–D period. Probably also with this period one have to synchronise so numerous bifacial forms obtained from this site – closer undefined roughouts (97 pieces), sickle-shaped knives and their semi-products (67 pieces), and semi-products of bifacial points (2 pieces). Most likely they are ought to be supplemented by flake cores exploited using Clactonian method (26 pieces), a small series of blade-like flakes, and tools such as backed knives, sidescrapers, scrapers, denticulate flakes and chunks (in total nearly 40 pieces), and with non-siliceous artefacts – drill-core of a shaft-hole axe and a polishing slab.

It is impossible to associate flake debitage (nearly 17,700 pieces) that was numerously present at the site with any specific time horizon.

The array of knives is represented primarily by semi-products in various stages of completion and state of preservation. They were collected mainly from the surface of the site or obtained from the upper part of the cultural layer from a significant area (also outside the excavation units). Flint materials associated with 'Lusatian' settlement were scattered on an area exceeding one hectare, and this extent should be considered as an open one.²

² They probably constitute a part of a chain of sites of workshop nature stretching around the south-western fringe of the mining field in 'Świeciechów-Lasek', and running from the village of Kopicz to the hamlet of Lasek in Świeciechów Poduchowny, i.e. covering a stretch nearly 200–300m wide and at least 1km long. Surface surveys carried out in 1987 did not reveal in this region any materials that would back

Kopiec, site 8, Kraśnik district

The site was discovered in August, 1993 in the course of surveying the grounds around the area of 'Świeciechów-Lasek' mine, to which it originally was incorporated (as the result of the AZP surveys). It is located in the bank zone above the floodplain of the Vistula river, about 200m to the east from its edge. Small scale excavations undertaken in the same year (covering an area of 60m²) also here revealed a settlement with two phases of occupation – scanty Final Palaeolithic exemplified by a single core of Mazovian type, and a workshop in the immediate vicinity of a mining field associated with the Lusatian culture (dated back to the final stages of the Bronze age or Early Iron age). A cultural layer of up to 70cm in thickness from the ground surface yielded, besides several pottery sherds of Lusatian culture vessels, a flint inventory that includes nearly 1950 items. Among them the following were found: several flake cores (exploited using Clactonian method), roughouts of unidentified bifacial forms, semi-products – of few axes (bifacial, and one with quadrilateral section) and a dozen or so knives (crescent-shaped ones?), of which only two are completely preserved. In addition, there was a series of nearly 30 tools made on flakes and blade-like flakes, including: scrapers, sidescrapers, endscrapers, borers, and splintered pieces – few specimens of each, to name a few. Also, a single pick was found there (Florek and Libera 1994: 13).

Analysis

Division of sickle-shaped knives into two subtypes: semi-triangular (A) and crescent-shaped (B), is the outcome of an analysis made on the basis of a series of almost 730 'sickles' registered in the Polish lands and in Volhynia (cf. Bargieł and Libera 1997: 153–157; Libera 2001: 52–59).

Despite the incompleteness of most of the bifacial artefacts from Kopiec (sites 4 and 8), the analysis of the forms which render the possibility to associate them with 'sickles' clearly indicates that the intention of the manufacturers was to obtain sickle-shaped knives generally similar to the crescent-shaped forms. Despite different degrees of their completion, it is clear that we are dealing with heterogeneous varieties, sub-varieties, or even variants. However, the exact identification on more detailed levels of classification is not possible due to the state of preservation of the artefacts.

For their production flat fragmented concretions of grey Turonian flint were used, which probably had been obtained in the immediate vicinity of the sites – at the mining field of 'Świeciechów-Lasek' mine. Excavations

carried out by Bogdan Balcer in 1967 and 1970 in the central part of the outcrop in 'Świeciechów-Lasek' revealed the following stratigraphy of the near-surface layers: I – level of humus approximately 25cm thick, with high amount of small chunks of gaize; II – weathered rubble consisting of various-sized chunks of gaize (the size of which increases with the depth) in the upper section it is combined with sandy formations, while in the lower contains clayish matrix; the base of the rubble is at the depth of 50–100cm below the surface; III – laminarily broken deposits of gaize transforming in the lower section into solid rock. Depending on the location of the set up excavation units Świeciechów flint both as artefacts, as well as natural chunks appeared with different saturation within the two upper levels. Only the excavation unit located near the culmination of the hill, in the uppermost part of the cracked gaize deposits two tabular deposits of black flint – at the depth of 60–70cm and 105–120cm were discovered (Balcer 1975: 153–156).

Geological processes within the Rachów anticline caused the original gaize caprocks to become subject to weathering in the Tertiary Period. Strata of flint nodules embedded in them at different levels ended up in a single layer of rubble, thus creating a very rich secondary deposit. Such a shallow deposition of grey Turonian flints – Świeciechów, Gościeradów and others, within the layer of weathered down rubble, as well as in primary deposit could have been the key determinant of the methods used for flint exploitation. Due to easy accessibility to the raw material, it should be assumed that the mine in this region was of open-pit type, and acquisition of even large nodules from primary deposit could have been carried out using not very deep shafts. As a result of intensive agricultural work, mining pits of prehistoric activities did not survive on the surface. Probably huge clusters of concretions with sharp edges and lumps of flint with single removals, abandoned precores and initial cores, and very numerous production waste (chunks, flakes) are the remains of prehistoric mining. Workshop sites often mesh with one another and their boundaries are nowadays difficult to determine. However, within 'Świeciechów-Lasek' mine a few pits beneath the ground surface were observed in one of the excavation units by Balcer (1975: 162). These were hollow pits of oval outline, with the dimensions of 160 x 120cm and 100 x 80cm, and the depth of 55–85cm. Three mining pits of similar size were partially identified in Nowy Rachów (Bargieł and Libera 1996: 36–37, Fig. 1B).

Sickle-shaped knives from Kopiec (sites 4 and 8) were mostly made using core reduction technique from concretions and debitage blanks, selected in terms of shape and size. The production process in fact can be reduced to two main stages. In the first, initial,

then allow for associating them unambiguously with settlement from this period (cf. Libera and Zakościelna 1987, 2002).

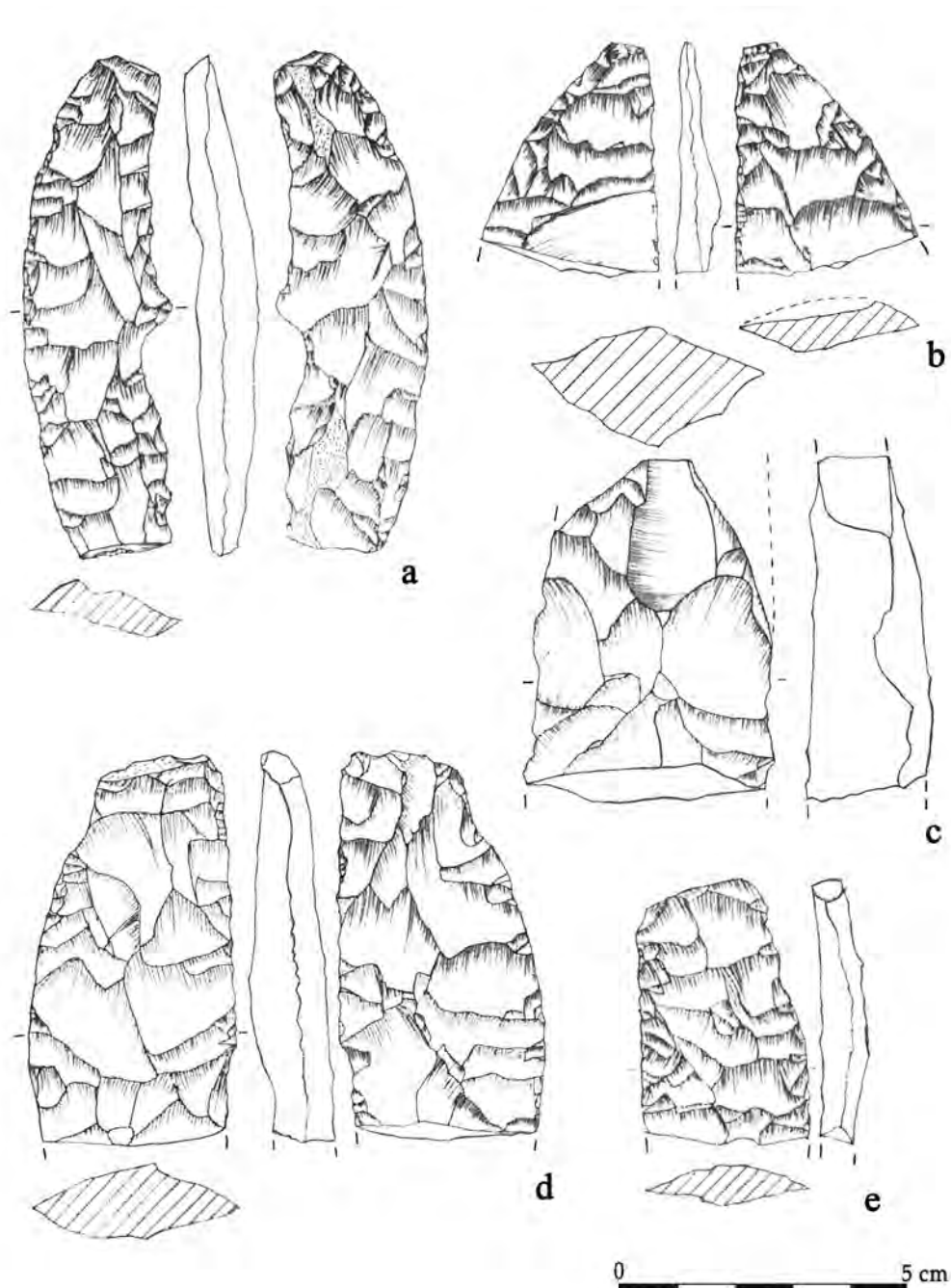


Fig. 2. Kopiec, Kraśnik dist., site 4. Selection of roughouts and semi-products of sickle-shaped knives.
 Drawn: J. Libera.

stage a rough outline of a future tool was shaped by reduction of the bulk of the raw material using hard percussion hammerstone. This is not a kind of treatment affecting the entire surface, often large cortical parts, wind-eroded surfaces, and natural fractures were left unaltered. Occasionally, the knives were made out of macrolithic blade-like flakes or flakes, which is evidenced by the light side curvature of a specimen, negatives preserved in its central part, and bifacial retouch that is not always affecting

the entire surface. At this stage of production initial specimens (roughouts) are relatively thick, their edges are zigzagging, both in outline and side view. This is the dominant group of specimens found in Kopiec (sites 4 and 8). In the second, forming, stage the final shape was given to roughouts through flat invasive retouch (*en pelure*) with fairly large overlapping negatives running perpendicularly to the retouched edge and covering a substantial part or entire worked surface. Sometimes, additionally, regular edge retouch was implemented in

order to adjust both edges. This is merely a correcting, discontinuous, single sided or bifacial retouch aimed at final adjustment of the edges. Also, special treatments designated to form the base into an edge through a pseudo-burin blow (or a series of such blows) or surface through intentional breaking off were implemented. During this stage the knives received their final shape – their metric parameters and final appearance. This includes part of the finds from Kopiec (mostly at site 4, Fig. 1 and 2).

A peculiarity typical of crescent-shaped knives (all varieties of this subtype) is frequent forming of the working inner edge on the entire length of the side with denticulate retouch, while this type of retouch is never present on the opposite side. It is a finishing single-series retouch, consisting of a number of short semi-abrupt negatives that do not overlap but are adjoined with edges, thus forming a regular denticulate edge. Occasionally, polishing treatment was used. It was limited to the central portion of the body – including its significant length and width, or concentrated on its central part (cf. Libera 2001: 59). Neither denticulation (tools with such edge in the older literature were referred to as ‘denticulate knives’ or ‘saws’) nor polishing were not detected at the sites in Kopiec.

In the group of forms identified as sickle-shaped knives (Kopiec, site 4), only on two fragments traces of wear polish and gentle abrasions were observed. They are probably the result of use wear. The remaining collection consists of roughouts and semi-products – at various stages of completion. It is difficult, however, to assess comprehensively the total amount of the finished products, since the vast majority includes fragmented specimens – distal (tip) or proximal (basal) fragments, or central and proximal (basal) ones that preclude accurate reconstruction. Only a small percent constitute completely preserved specimens or ones lacking only minor fragments. Nevertheless, their morphological and metric diversity indicates that the workshop functioning here in the late prehistory (similarly to the one at site 8 in Kopiec) produced exclusively crescent-shaped knives of different varieties, from wide to very slender ‘thin crescent-shaped’, both with well-defined bases and ones similar to distal tip. Therefore, it must be assumed that the forms discovered in Kopiec (site 4 and 8) represent only sickle-shaped knives of the crescent-shaped sub-variation. Only in the case of few artefacts (completely preserved or possible to reconstruct), can we conclude that they correspond to sickle-shaped knives BAI, BAI1, and BBI according to the typology by the author (Libera 2001: 50–52).

In the case of these two sets, the presence of semi-products with varying outline of the inner edge – convex, straight and concave, undoubtedly reflects

the intention of the knapper(s) and results from their particular predestination. This observation contradicts the statements claiming that fully formed knives (often having intensive use wear gloss), and with inner edges to a various extent concave, are merely derivatives of specimens with straight edges resulting from re-shaping thereof.

However, it should not be expected that every re-shaping of a knife is possible to be identified. The type of raw material a given item is made of plays a crucial role in this matter. Obviously in case of flint with matte surface – such are Świeciechów and Gościeradów flints – it is much easier to trace the stratigraphy of negatives, polishing, different degrees of use wear gloss, re-polishing, as well as modern-day damage (often mistaken for re-shaping). A greater degree of difficulty in reading the secondary retouch applies to types of rocks with glossy surfaces, or, indeed, glassy luster. The amount of time for which these tools were used is also significant. It is definitely easier to identify changes in the case of items used for longer time, and, therefore, having very intense macro-traces on surfaces with use wear polish, or even ‘lustre’.

From macroscopic analysis of the surface of sickle-shaped knives it can be inferred that the extent of use wear polish and glossing most often cumulates around the tip – predominantly along the inner side and to a lesser extent also on the opposite side. These are the essential ‘working’ parts of these specimens and mainly them (if not exclusively) were most often subject to reshaping, both as a result of blunting of tip’s edge, or tip braking off. At the same time, the mentioned earlier concave, sometimes very deep trimming of the inner side and consequently asymmetrical cross-section of a specimen, having a more obtuse angle from the indented (i.e. re-shaped) side evidences the re-shaping of an artefact through secondary retouch of the edge. This apparent discrepancy is probably the outcome of the way work was done using these items. Depending on the type of housing these flint knives could have been a part of a knife/dagger or a sickle. They also could have been used without permanent handles (especially wide macrolithic specimens). In turn, secondary forming of the cutting edge (its re-sharpening) led to their transformation, sometimes significantly altered from the original form.

In case of hafting a flint knife by its proximal end (similarly to a modern-day kitchen knife), its ‘re-sharpening’ (secondary retouch) caused the tapering of its working part evidenced by the slightly concave inner edge. It could also include the distal end part of the opposite edge – changing the ‘blade’ into a slender pointed tip, while maintaining the original (wide) base. In extreme cases, the amount of trimming resulting

from re-shaping that is possible to reconstruct on the basis of its initially usually symmetrical cross section sometimes equalled to 1/3 of the original width, especially in the distal end part. Different effect of repairs can be observed on flint knife embedded in a housing with its outer edge, in the case of which the entire 'straight' edge acted as a working edge, and hence also the 're-sharpening' procedure was applied to its entire length. In such case, mostly width of the specimen was reduced.

The arrangement of use wear polish observed on many sickle-shaped knives – on the entire length of the inner edge (including the basal part) and considerable length of the outer (in some cases covering more than 3/4 of the length from the tip), and 'blunt' both edges in the distal end part, clearly indicates that these tools were used without permanent (organic) handles, perhaps by holding them directly in hand or protecting with a piece of cloth or leather.

In the first two reconstructions the type of housing and the manner in which the flint knife was mounted (cf. Libera 2001: Figs. 33 and 34) probably influenced the scope and the frequency of re-shaping treatments. It should also be remembered that, irrespective of the housing or using the tool without it, there was slight shortening of flint knives – either only at the distal end, or at both distal and proximal ends. The only constant dimension in all varieties of this sub-variant of knives is probably their thickness.

The matter of reconstructing re-shaping and alterations that are possible to be identified within the group of crescent-shaped 'sickles' is very complicated. A number of specimens have tips formed similarly to the bases (in contrast to the sub-triangular knives). However, on the surface of few specimens (e.g. from Woźuczyn, Tomaszów Lubelski district, and Wólka Krowicka, Lubaczów district) the observed tips had slight use wear polish and secondarily retouched side edges – with original (partially cortical) both tips as well as bases, which can be identified as model exemplifications evidencing re-sharpening. Intense use wear of crescent-shaped knives and secondary retouch of both side edges on almost their entire length can be seen on items from Rabinówka, Tomaszów Lubelski district, and Teptiuków, Hrubieszów district. To a lesser extent secondary retouch is perceptible on the 'sickles' from e.g. Hrubieszów, Hrubieszów district, Podlodów, Woźuczyn, and Majdan Górny, Tomaszów Lubelski district (Libera 2001: 65).

Data for understanding certain varieties of sickle-shaped knives are also provided by their roughouts, semi-products and finished pieces obtained primarily from flint workshops, be it the ones located within

mining field or in the immediate vicinity of thereof. As regards to the crescent-shaped forms their presence was confirmed on a few sites: 'Krzemionki' Opatowskie, Ostrowiec Świętokrzyski district (Żurowski 1962: Fig. 37; Bąbel 1997: Fig. 1b), Polany-Kolonia, Radom district (Schild *et al.* 1977: 62, tables XXIX–XXXI), Ożarów, Opatów district (Budziszewski 1981: Fig. 619:1), Wierzbica 'Zełe', Radom district (Młynarczyk 1983: Fig. 17:3), Polany, site II, Radom district (Chmielewska 1973: Fig. 2C, 3B, 1988: table III1, V3). However, their main production took place in Volhynian workshops located by the Styr River and Horyn River, e.g. in Sapaniv, Tranopil district, Mirohoszcza, Dubno district, Narayiv, Tranopil district, to a smaller extent also in Podolia, including Shumbar, Tranopil district (cf. Libera 2001: 65–66 – source literature there).

Semi-products of knives clearly indicate the final shape of future artefacts. This is manifested by the way in which the tip, the base and both side edges are formed, as well as in the metric proportions of particular elements. It is important to emphasise at this point the fact that among the roughouts of the sickle-shaped knives forms with concave inner edge were identified (Sapaniv, Polany-Kolonia), which clearly indicates the deliberate shaping of even 'thin crescent-shaped' forms – classified as variety III according to the typology by the author (Libera 2001: 54, Fig. 20) and thus excludes them from a group of tools in which concave inner edge is the aftermath of their multiple re-sharpening.

Conclusions

Studies carried out in recent years on selected bifacial products, including sickle-shaped knives, have clearly shown that species of the crescent-shaped sub-variation in the area of Lesser Poland should primarily be associated with the population of the Trzciniec and Lusatian cultures (Bargieł and Libera 1997; Budziszewski 1998: 294–295; Bargieł *et al.* 1999; Libera 2001: 129–130, 2005: 131, 2006: 200–201, 2008: 98–99). Still, until now it was impossible to correlate particular variety/sub-variety/variant – with only one of these cultural units. However, some evidences seem to indicate the possibility to associate with 'Lusatian' settlement relatively slender forms, both with well-defined base, as well as the ones having base similar to tip, and with the inner edge straight or concave (the latter are then resembling the 'thin crescent-shaped' forms). In turn, the flint crescent-shaped knives with well-defined wide base (linear or similar) and the inner slightly convex or straight and clearly lowered cutting edge (working named 'knives of Besenyöd type'; according to Libera 2001 it is BA1b type), as well as specimens of very concave inner edge (the so-called 'knives of Jasło type'; having analogies in BAIII type) should possibly be associated with the Otomani culture settlement (or its

influence). Undoubtedly they stand out among other crescent-shaped forms. In both cases they depend only on Volhynian flint as the raw material. Their cultural differentiation probably should be sought in the outline of the base: clearly wide (close to the maximum width of the specimen or being the widest part) – in the group of ‘Trzciniec’ (and ‘Otomani’) knives and a more narrow (roughly equal to the half of the maximum width of a specimen) – among the ‘Lusatian’ knives (Libera *et al.* 2015: 94).

From the moment of their discovery the issue of cultural affiliation of sickle-shaped knives found on the territory of Kopiec, site 4 and 8, and more precisely pre-forms at different stages of completion, stirred considerable interest. Already in the initial fieldwork reports, scholars conducting the research from the beginning suggested association of these items with population of the Lusatian culture. Not without significance was the presence of prehistoric pottery on both the sites (e.g. Bargieł and Libera 1993, 1995, 1998; Florek and Libera 1994; Libera and Florek 1998 a; 1998 b). They are supplemented by earlier stray surface finds of similar bifacial forms that were obtained from both the area of grey Turonian flint deposits, and the direct vicinity thereof in Kopiec, Świeciechów Duży, Rachów (Krzak 1961: Fig. 7c, 1965: Fig. 19, 20; Libera 2005: Fig. 4a–c, e; unpublished collections of State Archaeological Museum in Warsaw II/2508 and the Institute of Archaeology, Maria Curie-Skłodowska University in Lublin).

The area of the Rachów anticline and Gościeradów anticline were subject to permanent settlement only at the time of the development of the Lusatian culture, especially during the period of its decline, when almost all present here types of grey flint (except for the black one) were utilised. From the older research and verification of the AZP surveys at least 20 sites with ‘pottery’ of population of this cultural entity are known to be located within, or in the immediate vicinity of the outcrops of grey flint (cf. Libera and Zakościelna 1987: 45–46, Fig. 1).

Existence of such intensive ‘Lusatian’ settlement (mainly during the transition period from the Bronze age to the Early Iron age) in this area was probably dictated by easy accessibility to flint deposits. Their widespread use by the population of the Lusatian culture is evidenced by the results obtained primarily at the settlement in Kosin, Kraśnik district. Being located in the immediate vicinity of the outcrops (ca. 2.5km to the south to the edge of the Gościeradów flint deposits) it yielded diverse and very rich materials. A significant domination of flakes (including many with cortical or wind-eroded surfaces) over other categories of finds, and a very large share of cores in various stages of exploitation indicate that the entire

flint knapping process took place at the settlement. Primarily Gościeradów flint and to a lesser extent also Świeciechów flint were used (Bargieł and Gurba 1986). Despite significant typological diversity of the obtained there flint inventories, which formed foundation for the identification of industry of Kosina type (cf. Libera 2005), they did not provide bifacial forms.

From the Lesser Poland region at least 320 bifacial sickle-shaped knives (in varying state of preservation) are known. They are recorded in particular to the east of the Vistula River (cf. Libera 2001: catalogue and map 40–49). Great majority of them are imports of Volhynian and/or Podolian flint brought in from workshops located primarily on Styr River and Horyn River, e.g. Sapaniv, Mirohoszcza, and Narayiv – Rivne district (e.g. Jażdżewski 1936; Głosik 1962), also to a smaller extent in Podolia, e.g. Shumbar (e.g. Berezanska 1972: table XXVII:1, 2). These workshops were used by communities since the II period of the Bronze age probably until the Early Iron age.

Puzzling is the fact that despite the existence of the workshops producing crescent-shaped knives within the area of grey Turonian flint deposits and in the immediate vicinity thereof within the Rachów anticline, the finds of such knives made of this raw material are rare, both in this area and within the entire territory (within the range of the Tarnobrzeg group). We know only over 20 specimens – mainly stray finds. So far, the only specimen discovered at a cemetery is the knife coming from a cultural layer found in Komarów-Osada, Zamość district (Bagińska and Libera 1996: 71, Fig. 23c).³ Few items are known from settlements. A completely preserved knife was found in a pit on the territory of Wola Rzczycka, Stalowa Wola district, site 1 (Moskwa 1976: Fig. 85g; also Libera 2005: Fig. 4d). Two specimens were obtained from a destroyed settlement in Opoka, Puławy district (Zakościelna and Libera 1991: Fig. 11:1, 2). Few fragmented specimens were discovered in Zawada, Staszów district (Kozłowski and Sachse-Kozłowska 1997: Fig. 4a–d) and Świeciechów Duży, site 3 (Libera 2005: Fig. 4a–c, e). Subsequent fragment originates from site 19 in Kosin (Kruk 1994: table XXVb). Unclear is the context of a few ‘sickles’ mentioned by Zygmunt Krzak (1960: Figs. 1–3) from Grójec, Ostrowiec Świętokrzyski district, and also knives, including semi-products, obtained from ground surface (of a settlement?) from the village Stodoły-Kolonie, Opatów district.⁴ In recent years a multi-cultural collection of flint artefacts was revealed that includes a series of inventories among which interesting us here specimen of a sickle-shaped knife was present. The set has good

³ However, also Trzciniec culture pottery was discovered at this cemetery (Bagińska and Libera 1996: 80).

⁴ At the last of the mentioned sites (no. 6) besides ‘Lusatian’ pottery also fragmented vessels of the Trzciniec culture were found (cf. Bargieł and Florek 1999).

reference to the Kosin type industry (Florek and Libera 2009: table V:2).

A small share of crescent-shaped knives was made of raw materials from Lesser Poland: banded, chocolate, Jurassic-Cracow, Ożarów, and Rejowiec flints – a few pieces from each (cf. Libera 2001: catalogue). Their presence in the upper and middle Vistula river, evidences the emergence of a local ‘Lesser Poland’ market, producing items from local raw materials. Also products of Świeciechów and Gościeradów flint should be included in this group. It is, however, difficult to assess the scale of this phenomenon and to identify its cause. Involvement in local production may be caused by: too high ‘price’ of knives imported from Volhynia and/or Podolia; an attempt to break ‘Eastern monopoly’; a collapse of trade with the ‘East’ (e.g. as a consequence of war, migration of population, or disasters) that urged local production. Regardless of the cause, the production in Lesser Poland was undoubtedly modelled on the ‘Volhynian-Podolian’ knives.

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