

## THE BEGINNING OF THE USE OF QUARTZ-SERICITE SCHIST WHETSTONES IN SILESIA IN THE LIGHT OF NEW DISCOVERIES FROM LA TÈNE CULTURE SETTLEMENTS

Quartz-sericite schists were the most commonly used raw materials for the manufacture of whetstones in Silesia in the Roman period and the Middle Ages. Their deposits can be found in the vicinity of Jegłowa (pow. strzeliński; woj. dolnośląskie/PL) in the Strzelin Hills and are the only resources of this kind in Europe. The unique mineralogical characteristics of whetstones made from such a schist and the possibility of their easy identification make this material a convenient research subject. One of the issues that were stressed in previous studies (Pazda/Sachanbiński 1991, 67) is the beginnings of exploitation of the Jegłowa raw material and the distribution of whetstones made from this quartz-sericite schist. Although a lot of petroarchaeological research has been done, so far it has not been possible to find out since when this raw material was used. S. Pazda and M. Sachanbiński suggested that the beginnings of its use could perhaps be observed in the La Tène period among the Celts. However, they did not acquire convincing evidence that would enable them to support this theory (Pazda/Sachanbiński 1991, 67). Our paper offers new data from the archaeological research in Samborowice (pow. raciborski; woj. śląskie/PL) in Upper Silesia, which allows the identification of the beginnings of using this raw material in the period of La Tène culture in Silesia.

With studies carried out by Polish and Czech scholars, the development of petroarchaeological research in Central Europe allowed for the identification of some rock deposits which were in use in prehistory and the Middle Ages (Štelcl/Malina 1975; Přichystal 2009). The highest dynamics of this work could be seen in the 1970s and 1980s. These studies were continued by the next generations of researchers (Majerowicz/Skoczylas/Wójcik 1999) and they resulted in the verification of previous finds. Furthermore, as the source basis increased, they promoted new concepts and ideas (Kaźmierczyk 1990; Cholewa 2004; Jaworski

▯

Quartz-sericite schists have not always been believed to be related to the Strzelin Hills. Before 1945, these raw materials were not quite fully correctly defined as phyllites, perhaps due to the silvery shine that is produced by a high admixture of sericite (the so-called pearly shine is one of the characteristics of phyllite schists). Phyllite artefacts from the Roman period were studied before the Second World War by E. Petersen (1936, 230 fig. 1) and Ch. Pescheck (1939). Eleven whetstones from Silesia that were made from »Phyllit-schiefer« and »Sericitschiefer« were known at that time (Pescheck 1939, 94). German scholars also found another petrographical term for early medieval whetstones. In this case, it was perhaps argillaceous/siliceous schist (Kurtz 1936, 37).

In research on stone artefacts, it was not until the end of the 1970s that whetstones made from quartz-sericite schists were believed to be related directly to the deposits in the Strzelin Hills. The place of origin of this raw material was generally defined as the Sudetes (Majerowicz 1970). The exact localisation of outcrops of these schists in the vicinity of Jegłowa in the Strzelin Hills first occurred in the analyses carried out by M. Sachanbiński (1978) on an assemblage of stone artefacts from early medieval Ostrów Tumski in Wrocław (Sachanbiński 1978; Sachanbiński/Kaźmierczyk 1988). Relating this deposit to the whetstones that were known from the archaeological site was a breakthrough in provenance studies (Rapp 2009, 3; Herz/Garri-

son 1998, 4; Štelcl/Malina 1975, 110-111; Skoczylas 1993) on finds from Silesia. This discovery resulted in later publications concerning various aspects of the extraction, distribution and use of quartz-sericite whetstones in prehistory and the Middle Ages (Borowski 2014; Gralak/Lisowska/Sadowski 2012; Gunia 2010; 2012; 2013; Gunia/Lisowska 2013; Jaworski 2008; Lisowska 2013; Michniewicz 1999; Wiśniewski 1999). These works significantly augmented our knowledge of the social and economic relationships of the area of

A paradox of these studies is the fact that, so far, it has not been possible to relate a specific quarry to extraction activities in the past. This is caused by uninterrupted exploitation of the deposit in Jegłowa and the existence of small pit quarries that are scattered on the eastern slopes of the Strzelin Hills. Excavations have not examined these quarries so far. Old (prehistoric and medieval) extraction activity may have been destroyed by later exploitation. It cannot also be excluded that these small outcrops were exploited in the Iron Age, which preserved their form of pit quarries.

### **PETROARCHAEOLOGICAL EXAMINATIONS OF THE OUTCROPS AND ITS DESCRIPTION**

Quartzites and quartz-sericite schists are rocks that are common in nature. In the area of the Sudetes, around a dozen of deposits were recorded. They differ from one another with regard to the lithology and geological age. Quartz-sericite schists from Jegłowa are rocks from the Early and Middle Devonian periods (Oberc-Dziedzic 2012). These layers are called the early schist series (Szczepański 2007), Jegłowa quartzite series (Sachanbiński/Kaźmierczyk 1988), or layers from Jegłowa (Oberc 1966). The protolith of these rocks were quartz sandstones with an admixture of argillaceous minerals (Szczepański 2001; 2007). In Jegłowa and its vicinity, three kinds of these schists can be found and their common trait is a silvery-white colour, sometimes with greyish and russet shades. These characteristics are distinctive for this group of rocks and this makes them easily distinguishable from others, even with the use of macroscopic methods alone.

In the eastern part of the Strzelin Hills, three variants of quartzites and quartz schists were identified (Pazda/Sachanbiński 1991, 58): thick-banded crystalline quartzites with a chaotic structure, medium- and narrow-banded quartzites with sericite and a clear directional structure, as well as »date«-quartzites (*Dattel-quarzit*) in which individual oblong quartz grains are surrounded by a fine-grained rock mass. In prehistory and the Middle Ages the second variant, which is quartz-sericite schists, was identified in a majority of whetstones. Single artefacts were made from quartzites belonging to the first group.

Quartzites and quartz schists from Jegłowa are remarkable because of a very high content of quartz (more than 90%), which is accompanied by mica (sericite – from 3 to 10%) and in some instances by accessory minerals such as zircon, tourmaline, and pyrite (Szczepański 2001; 2007). Quartz schists have a directional structure and marked foliation. These traits were used when preparing and separating whetstone material, and in 95% of whetstones made from these raw materials, the longer axis of the artefact was parallel to the direction of the alignment of individual blasts (Lisowska 2013).

For petroarchaeological research, M. Sachanbiński prepared the first geochemical and microscopic description of artefacts made from such rocks. Items made from quartz-sericite schists, which were discovered in early medieval Ostrów Tumski in Wrocław, were examined (Sachanbiński/Kaźmierczyk 1988). The same can be said about the Roman period finds from Silesia (Pazda/Sachanbiński 1991). This research allowed the establishment of the so-called petroarchaeological benchmark in this location, that is, an identified and petrologically classified deposit from which raw materials were extracted in prehistory and the Middle Ages. Rocks from this deposit differ from both other schists from the Sudetes and individual quartz-sericite schists

that are found among erratic materials. Whetstones made from these schists mark their presence in the inventories of Silesian assemblages coming from both the Late Antiquity and the Middle Ages. Due to the petroarchaeological identification of this deposit, archaeologists more often examine quartzite artefacts from Jegłowa, both on the basis of microscopic identifications and using a macroscopic method alone (Pazda 1995; Michniewicz 1999; Jaworski 2008; Jaworski/Wójcik 1997; Gralak/Lisowska/Sadowski 2012; Gunia 2010; 2012; 2013; Lisowska 2010; 2012; 2013; Madej/Wójcik 2003; 2004; 2007; Madej/Wójcik/Grodzicki 2003a; 2003b).

Five whetstones from the excavations in Samborowice were made from fine-blasted rocks with a clear directional structure, with oblong quartz aggregates separated by muscovite (sericite) plates. Based on macroscopic identifications, no larger amount of tourmaline or other accessory minerals was found in the case of these rocks. Such minerals would perhaps be visible if thin sections were made from these artefacts. These whetstones are silvery-white in colour and in some places on their surfaces, there are darker stains due to their use and post-depositional processes. From the point of view of the petrography, we can classify them as belonging to the second group of rocks, called quartz-sericite schists, which occur in the eastern part of the Strzelin Massif (Aleksandrowski/Mazur 2002), mainly in the vicinity of Jegłowa as well as Strużyna, Gromnik and Miłocice in the Strzelin district (woj. dolnośląskie/PL; **fig. 1**)

## THE LA TÈNE CULTURE SETTLEMENT IN SAMBOROWICE

New data on the exploitation of quartz-sericite schist deposits was provided by research on the La Tène culture settlement in the vicinity of Samborowice in Upper Silesia. Numerous traces of the La Tène culture settlement were recorded there. The sites were located on fertile loess soils, in the valleys of the Rivers Psina and Troja (**fig. 2**). This area is extremely significant for the studies on prehistoric settlements, as it is situated in the northern area of the Moravian Gate, which was the most convenient passage between the Carpathians and the Sudetes. Thanks to excavation research which has been carried out at two sites (Samborowice 13 and 17), La Tène culture features were found. Their fills contained numerous different artefacts,



are the remains of pit-houses. At site 13, which is located in the south-eastern part of the locality, on the terrace of the River Psina's valley, artefacts made from quartz-sericite schists were discovered in features 84 (**figs 3-4**). Feature 84 was located in the eastern part of the site and it was perhaps part of the buildings of a separate farmstead, which was identified with the use of geophysical prospection. It was then explored during test excavations (**fig. 5**)

neighboured on pit-houses (features 132 and 134) which can be identified as the remains of an earlier (Early La Tène) building phase of site 13.

Both aforementioned features provided numerous finds, among which some artefacts can be seen as precise time-markers. In the fill of feature 84, a fragment of a dark blue glass bracelet was found (**fig. 6**) belongs to group 8a in the classification proposed by Th. E. Haevernick (1960). The whetstones from feature 128 were accompanied by two fragments of glass bracelets of a very similar colour. However, these belonged to type 13 according to Haevernick (**fig. 7**)

ally in use for a very short time and their precise chronology is based to a great extent on grave finds. The chronology of group 8a bracelets is limited to Phase Lt C1b (Venclová 1990, 124; Karwowski 2004, 77 fig. 25). In the periodisation system proposed by R. Gebhard (1989), this phase is to be related to the late 3<sup>rd</sup> century BC and the first decades of the 2<sup>nd</sup> century BC. Finds from group 13 (row 4 according to the different typology of R. Gebhard) are made from dark blue glass and have no additional glass ornaments;

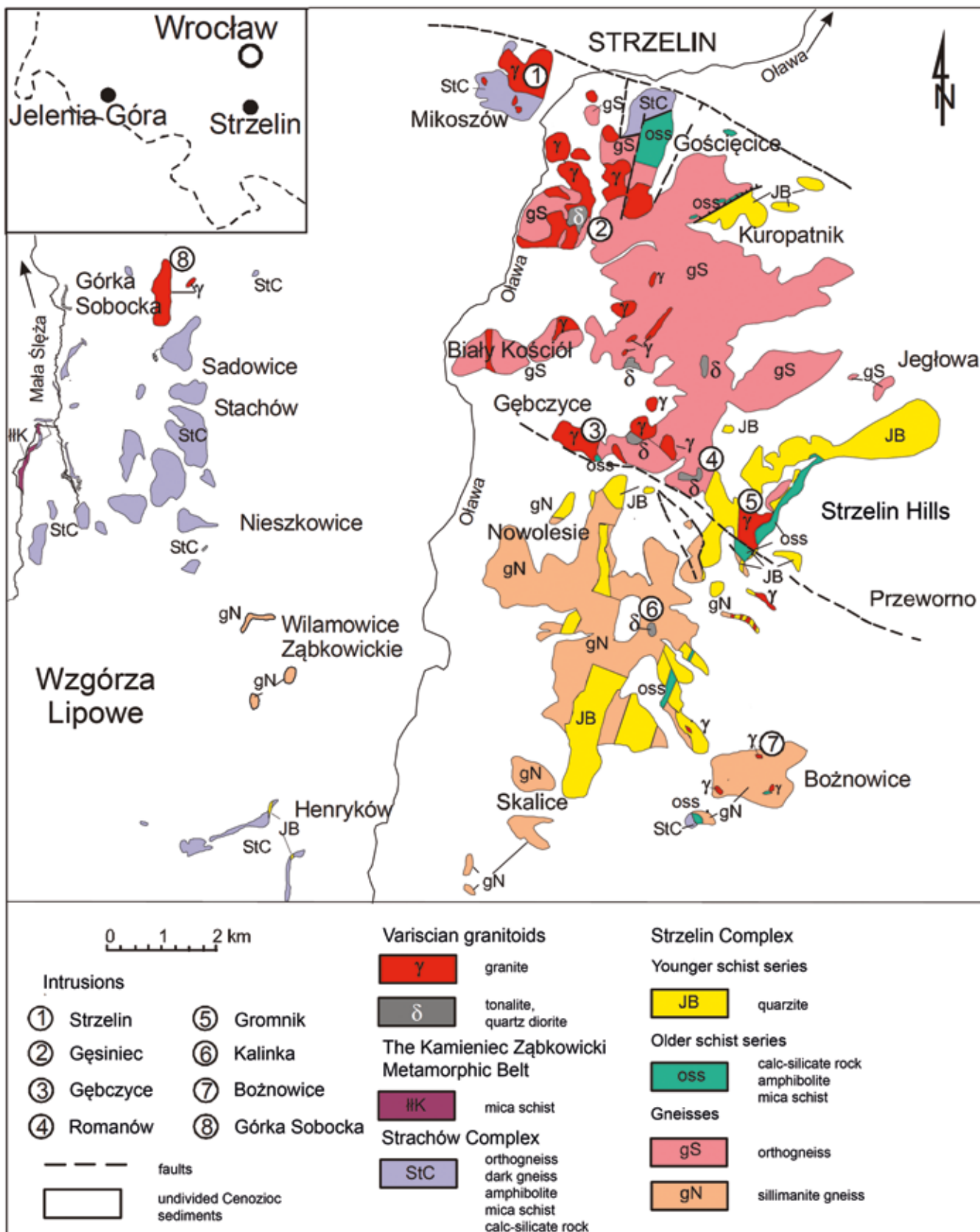
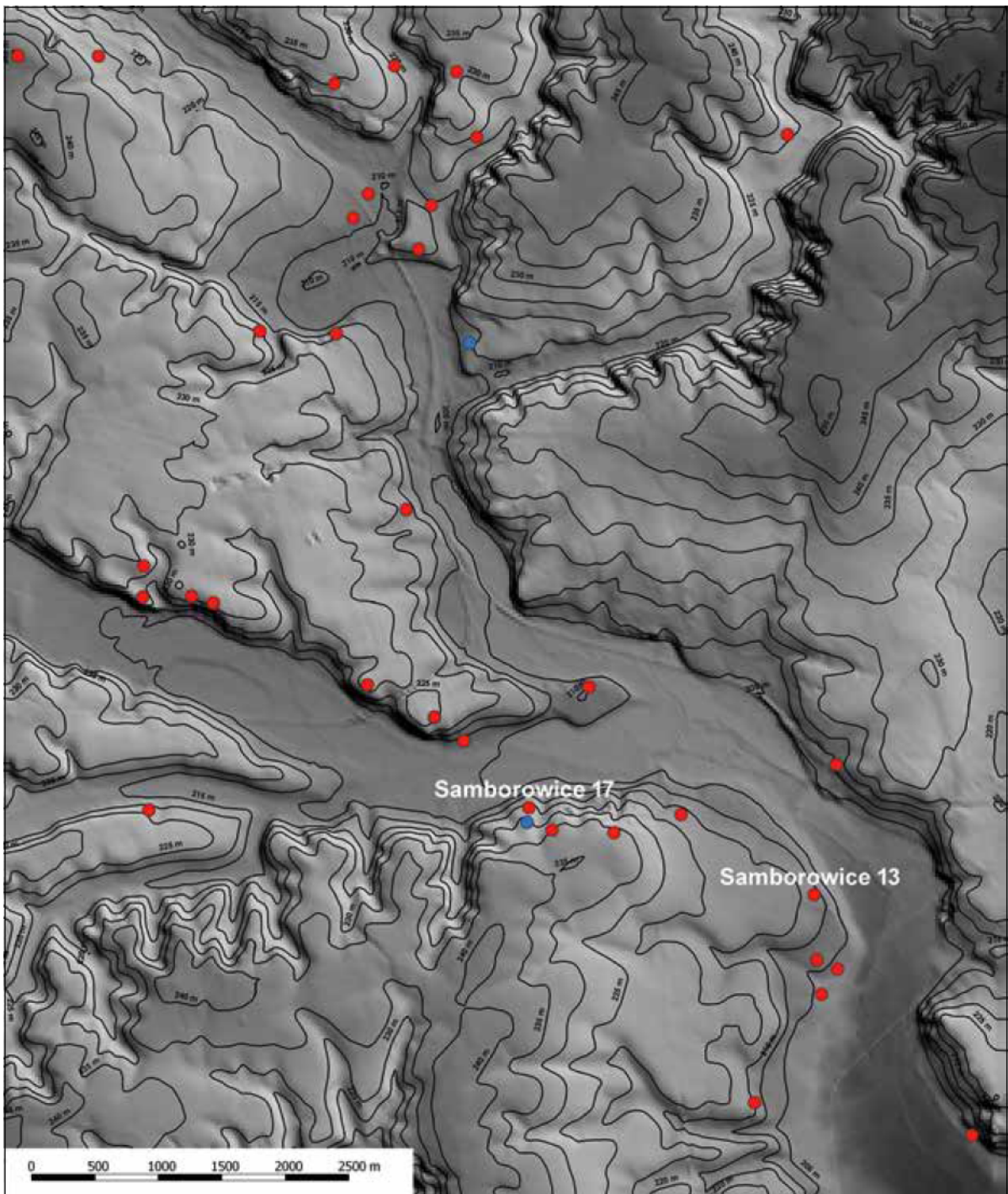


Fig. 1 Geological map of the Strzelin Hills. – (After Oberc-Dziedzic/Madej 2002, fig. 3).



**Fig. 2** The micro-region with La Tène settlements in the vicinity of Samborowice in Upper Silesia. – ● settlement sites; ● burial sites. – (Map J. Soida).

recently, such finds have been classified by N. Venclová into separate group 13a. They are slightly later and occur mainly in Phase Lt C1b. They become outdated as late as Lt C2 (Gebhard 1989, 128 fig. 50, 2; Karwowski 2004, 77 fig. 25; Venclová 2016, 51-52).

Hundreds of ceramic vessel shards from the fills of both the features were also studied. Within this assemblage, it was possible to fully reconstruct at least a dozen of entire forms (figs 8-10). Taking into account

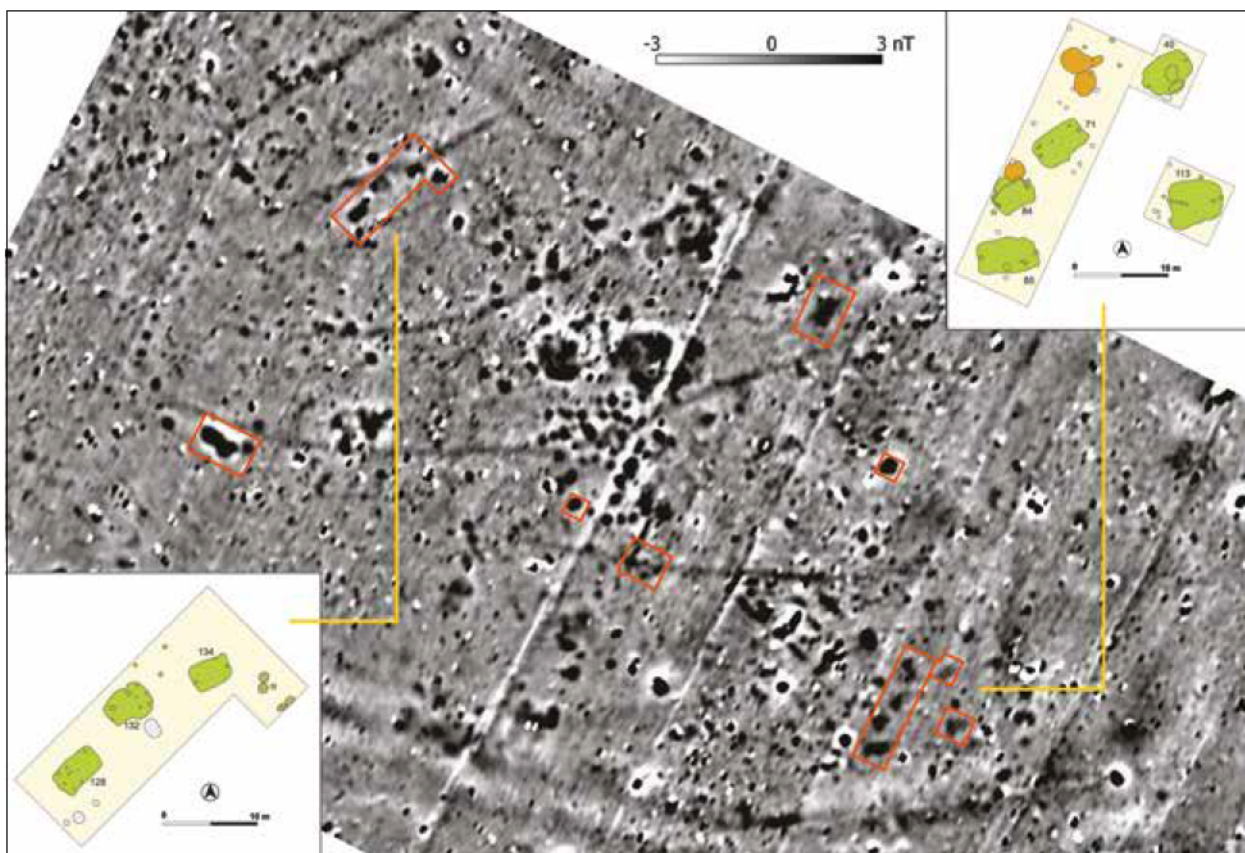




**Fig. 3** Samborowice (pow. raciborski; woj. śląskie/PL), site 13, feature 84. – (Photo J. Soida).



**Fig. 4** Samborowice (pow. raciborski; woj. śląskie/PL), site 13, feature 128. – (Photo J. Soida).



**Fig. 5** Samborowice (pow. raciborski; woj. śląskie/PL), site 13. Magnetic prospections with marked archaeological trenches. – (Illustration P. Dulęba / J. Soida / P. Wroniecki).

the types of vessels which could be identified between the abundant pottery finds, there is a preponderance of S-shaped bowls that are typical of the Middle La Tène period. Furthermore, vases and graphite pots commonly called »situlae« came also to light. All the mentioned types of vessels have their exact analogies within the pottery from chronological horizons 4 and 5 proposed by J. Meduna (1980, 142-145 figs 19-20) for settlements in Moravia. In feature 84, as much as 49 % of the pottery finds were shards of wheel-made

vessels, which is a very high percentage, compared to other sites from the region. Out of them, 16 % was graphite pottery (with an admixture of graphite in the ceramic mass) which was very characteristic of the La Tène culture. Vessels of this kind were usually »kitchen« pottery, and their numerous shards bear traces of secondary burning on the bottom parts, which may imply that they were used for cooking. A bowl-shaped slag was also discovered in the remains of the same pit-house, which confirms a local smith processing iron. There is every reason to believe that a blacksmith's workshop was originally located in this building or its vicinity, and whetstones

whetstones made from quartz-sericite schist, a b also discovered in the fill of this feature) may have

A whetstone from quartz-sericite schist was also found in a pit-house that was uncovered at site 17 (fig. 11), which is situated in the valley of the River Troja, about 2.5km to the west of site 13. As the excavations at site 17 have so far been limited to one season and they are still in an initial phase, it is difficult to say more about the exact spatial arrangement of the settlement. Data provided by geophysi-

existence of numerous La Tène period features, which were loosely distributed within the entire area of a promontory that separates from the Troja's valley where site 17 is located (fig. 12)

(marked as feature 1) contained a high number of pottery vessels in its fill. The traits of these vessels

in fig. 13). On the other hand, there were also forms, which are also characteristic of the latest horizon (Lt C2) of Upper Silesian La Tène settlements.

fig. 13, 1). It is a very peculiar vessel with handles, which is extremely rare in the La Tène period. Due to an extraordinarily high amount of graphite in the ceramic mass, it is hard to believe that such vessels

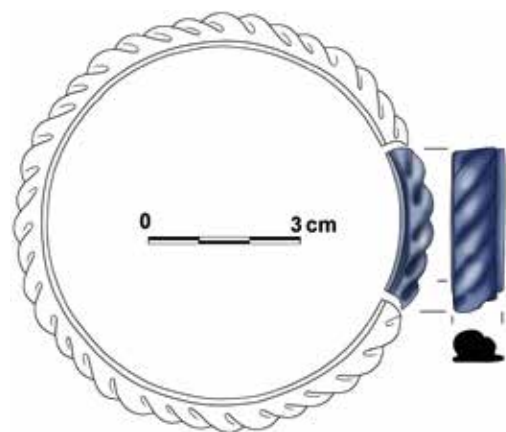


Fig. 6 Samborowice (pow. raciborski; woj. śląskie/PL), site 13. Glass bracelet from feature 84. – (Drawing N. Lenkow).

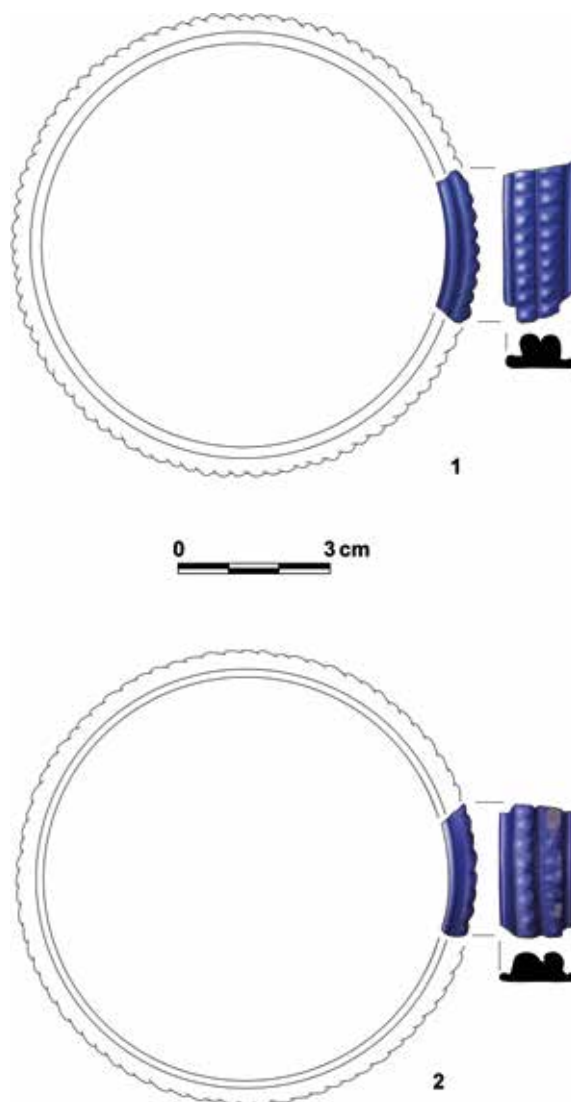
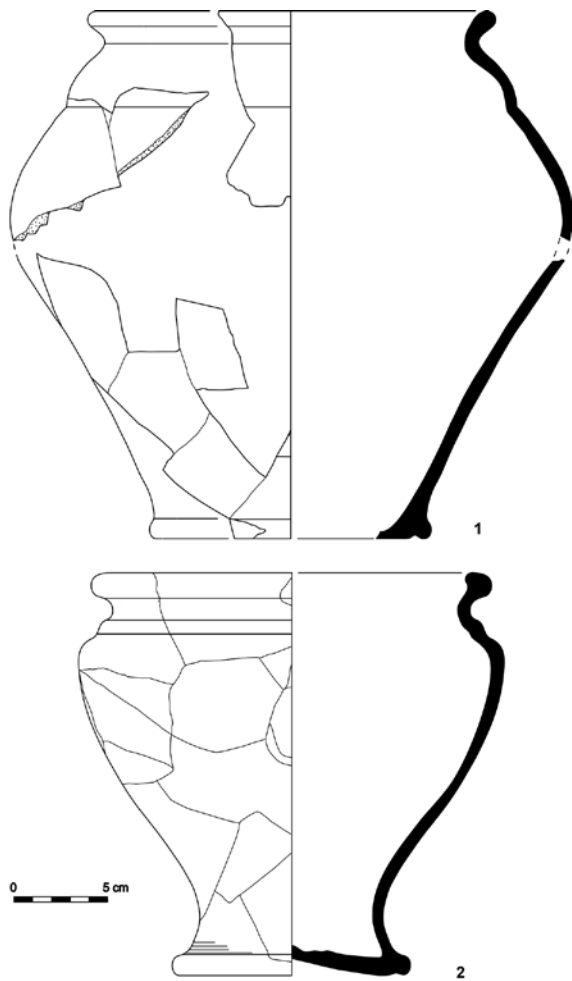
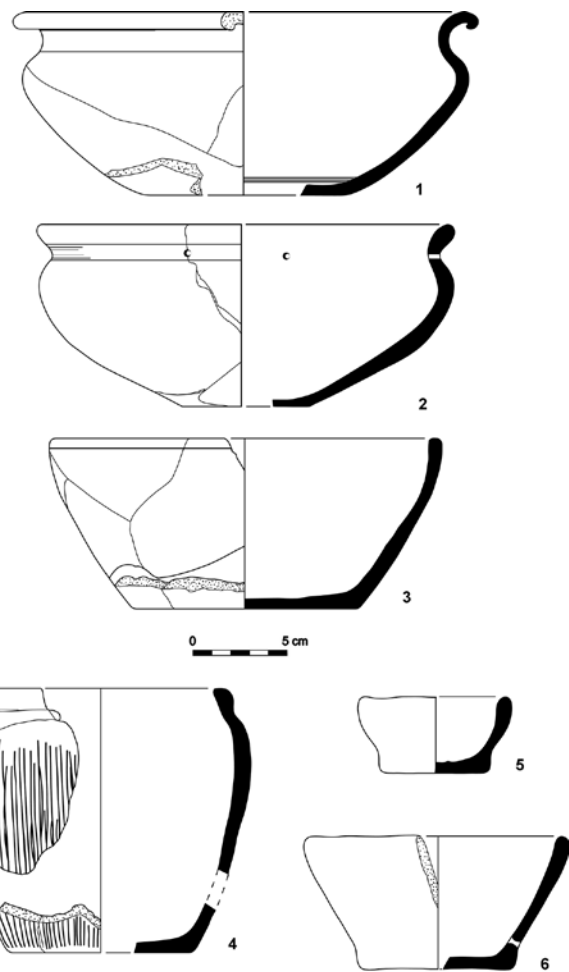


Fig. 7 Samborowice (pow. raciborski; woj. śląskie/PL), site 13. Glass bracelets from feature 128. – (Drawings N. Lenkow).



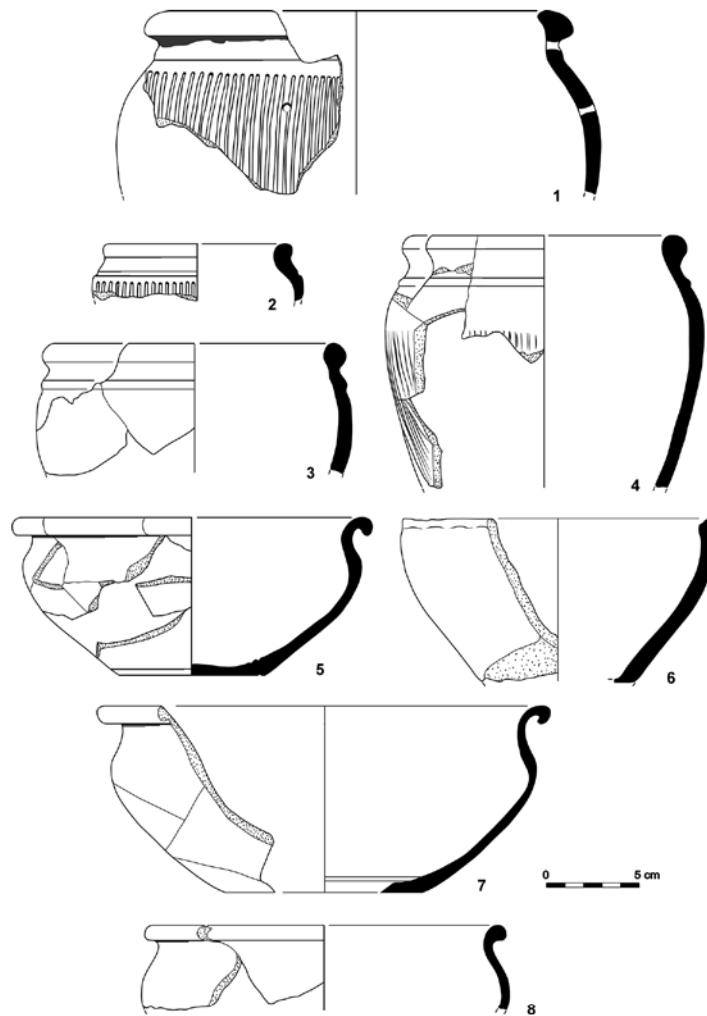
**Fig. 8** Samborowice (pow. raciborski; woj. śląskie/PL), site 13. Wheel-made vessels (1-2) from feature 84. – (Drawings P. Dułęba / J. Soida)



**Fig. 9** Samborowice (pow. raciborski; woj. śląskie/PL), site 13. Wheel-made (1-4) and hand-made vessels (5-6) from feature 84. – (Drawings P. Dułęba / J. Soida).

taminate any liquid substances. Similar pottery is known from an extensive craft and trade agglomeration in Nowa Cerekwia (pow. głubczycki; woj. opolskie/PL), which is just about 17 km west of Samborowice (Czerska 1959, fig. 10, 1; 1964, fig. 3, 5; 1976, figs 5c; 6b). Apart from Upper Silesia, cauldron-shaped bowls are also known among finds from Western Lesser Poland, Moravia, Southern Bohemia, Western Austria and Bavaria (Kappel 1969, 76-77 fig. 26; Dułęba 2010, 72-74 map 2). Numerous iron artefacts (fig. 14), including two fragments of iron fibulae, were also found in feature 1 of Samborowice site 17. Regrettably, their state of preservation makes accurate typological classification impossible, which also means that no precise chronology of these finds can be identified. We can only classify these artefacts as belonging to the fibulae of Middle La Tène construction. To sum up, the pit-house discovered at site 17 should be considered chronologically later than features 84 and 128 from site 13, which were discussed above. The chronological position of the pit-house in question cannot be precisely defined. This is why it should be assumed that this feature may have been in use between the late Phase Lt C 1b and the end of Phase Lt C 2.

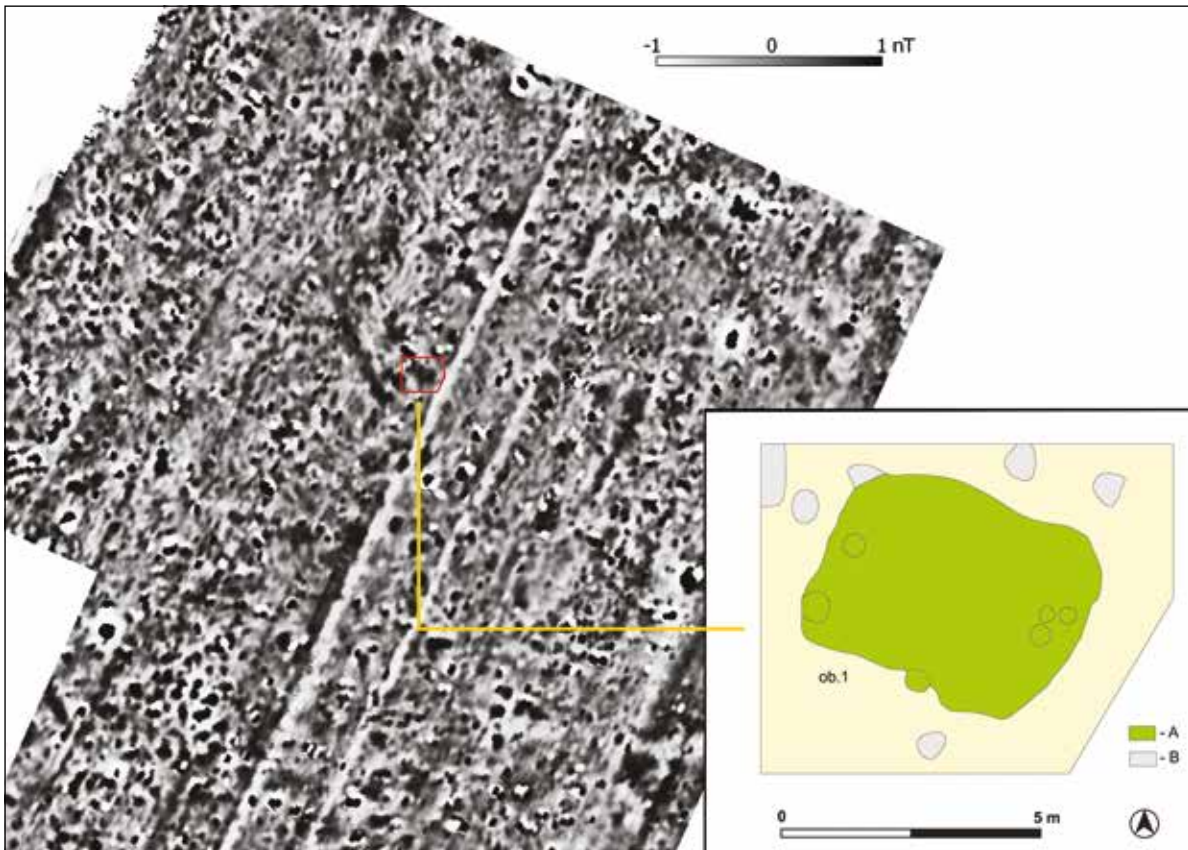




**Fig. 10** Samborowice (pow. raciborski; woj. śląskie/PL), site 13. Wheel-made vessels (1-5, 7-8) and hand-made vessel (6) from feature 128. – (Drawings P. Dułęba / J. Soida).



**Fig. 11** Samborowice (pow. raciborski; woj. śląskie/PL), site 17, feature 1. – (Photo J. Soida).



**Fig. 12** Samborowice (pow. raciborski; woj. śląskie/PL), site 17. Magnetic prospecting with marked archaeological trench. – (Illustration P. Dulęba / J. Soida / P. Wroniecki).

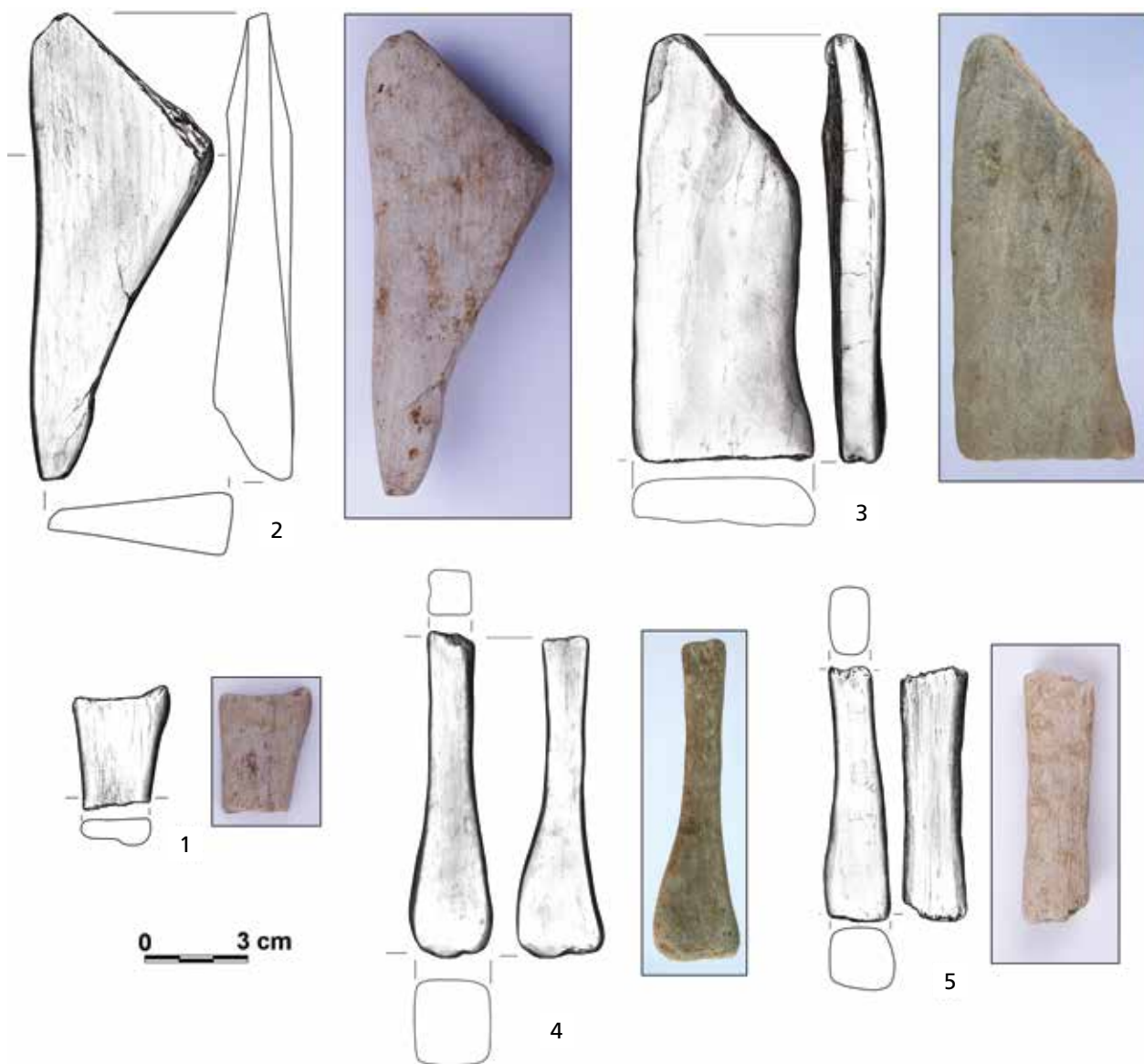
## QUARTZ-SERICITE SCHIST WHETSTONES FROM SAMBOROWICE

Five quartz-sericite schist whetstones, which were discovered at Samborowice, represent various forms and states of preservation. Three of these items are small finds, which could be used for sharpening small metal artefacts (e. g. knives), two whetstones are examples of massive artefacts which could be used in the household. Probably, the owner due to their considerable size and weight did not carry these items daily. The whetstones underwent morphological and petrographic analyses. Morphometric descriptions were prepared based on a whetstone classification proposed by H. G. Resi (1990, 12; 2008) with later additions (Lisowska 2013, 111-113). The exact sizes and weights are listed in the **catalogue of finds**.

The first of the examined miniature whetstones survived as a small broken fragment (**fig. 15, 1**)<sup>10</sup> wider side, it has a concave-trapezoid shape, while its narrower side is rectangular. The cross-section of the whetstone is irregular and it resembles a tear. The surviving end is trapezoid and diverging on one side, while the other side is rounded and obliquely chamfered. The whetstone has three even working surfaces, optically aligned scratches are left on them. The longer axis of the tool corresponds to the direction of the alignment of minerals in the rock.

The next find is an entirely preserved massive »household« whetstone (**fig. 15, 2**)<sup>10</sup> wider side and concave and trapezoid on its narrower side. The cross-section of the whetstone is triangular. The first end is converging and trapezoid on one side and oblique and rounded on the other side. The sec-





**Fig. 15** Samborowice (pow. raciborski; woj. śląskie/PL). Whetstones made out of quartz-sericite schists: **1-2** site 13, feature 84. – **3-4** site 13, feature 128. – **5** site 17, feature 1. – (Drawings N. Lenkow; photos P. Dulęba / J. Soida).

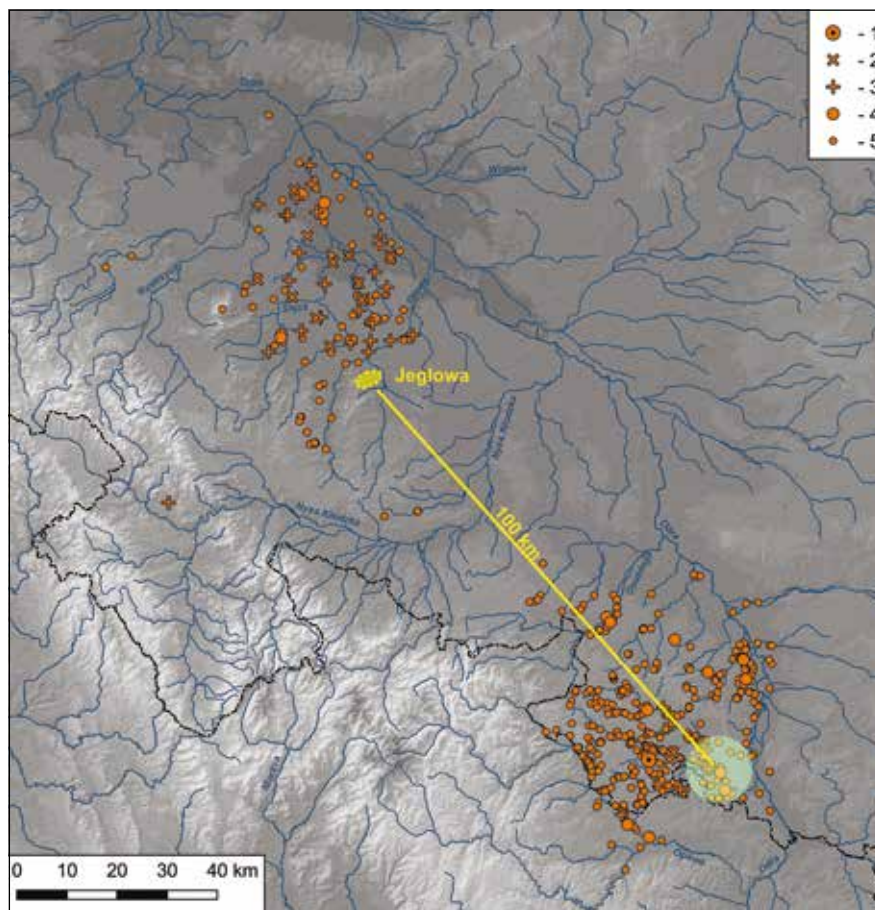
ond end is one-sidedly obliquely chamfered on the first side and two-sidedly obliquely chamfered in a converging manner on the other side. The whetstone has four working surfaces and one of these is situated on the end. These surfaces have no scratches; they are even, smooth and wavy. The longer axis of the tool corresponds to the direction of the alignment of minerals in the rock.

The third of the examined artefacts is a whetstone, which survived as a large fragment with its end featuring irregular rectangle-like working surface sides (**fig. 15, 3**)

was used, which caused a change in the form of the cross-section (from an oval to flat-oval) and formed a new fracture of one of the working surfaces. The surviving end of the whetstone is obliquely chamfered and rounded in its cross-section. The surfaces of the artefact are uneven and wavy and they are separated from each other with rounded edges. The longer axis of the tool is slightly oblique corresponding to the direction of the alignment of minerals. As the working surface of the artefact was used in an even manner, evident plates with an overwhelming content of muscovite (which is a softer mineral than quartz) caused a forma-



**Fig. 16** Map of the La Tène culture  
 between the deposits of quartz-  
 micro-region in the vicinity of Sam-  
 borowice is marked. – **1**  
**2** cemetery; **3** single grave; **4**  
 settlement traces. – (Illus-  
 tration P. Dulęba).



tion of concavities in the places where muscovite was present. This influenced the degree of waving of the

The next whetstone survived without one original end – both of them are broken (fig. 15, 4). On both sides, it has a concave-trapezoid shape and its cross-section is square like. The surviving end is divergently trapezoid on both sides and its edges are smooth. In four concave and even working surfaces, which are separated from each other with rounded edges, there are no traces of use, apart from characteristic smoothening. The longer axis of the tool corresponds to the direction of the alignment of minerals in the rock.

The last of these whetstones survived only in its central part, which makes it difficult to observe the manner of processing of the tool's ends (fig. 15, 5). The whetstone is trapezoid on its wider side and concavely trapezoid on the narrower one. The cross-section of the whetstone is square. Four working surfaces are separated from each other with rounded edges. No scratches can be seen on these surfaces, which are even and smooth, with no shine. However, traces are resulting from the strong weathering of the rock. The longer axis of the tool corresponds to the direction of the alignment of minerals in the rock.

## DISTRIBUTION OF STONE ARTEFACTS AND INTERREGIONAL CONTACTS

The discussed finds demonstrate that the beginnings of exploitation of Lower Silesian quartz-sericite schists are to be connected with the La Tène period, with special reference to the beginning of the Middle La Tène

period. The Jegłowa Massif, where deposits of the mineral in question are located, neighbours on the southern edge of the Lower Silesian cluster of the La Tène culture settlement. These Celtic sites, which were the closest ones to the mentioned deposits, were located in the valley of the River Oława within the area from Strzelin to Ziębice, and farther off to the west, in the watershed between the Rivers Oława and Mała Ślęza (fig. 16). Until now, as many as 16 archaeological sites with finds of the La Tène culture have been discovered

Upper Silesian finds of artefacts which are made from the raw material whose only deposit is located in Lower Silesia are a strong argument against a theory proposed by Z. Woźniak (1970, 168). It strongly implies the lack of communication between individual local groups of the La Tène culture in Poland at that time. The very location of the Celtic settlement in Poland suggests the existence of four regional groups that were separated from the territorial point of view. These groups may have corresponded to four distinct social (tribal?) organisations. These Celtic settlement clusters existed within somewhat different chronological frameworks, which may additionally impede the identification of similar traits of material culture. The Upper Silesian and Western Lesser Poland's group maintained very strong contacts with Celtic sites from Moravia and Lower Austria. It is in these regions that one should seek for the initial area of migration that gave rise to the existence of these groups. The Eastern Lesser Poland's group was different from the other ones and

regional connections of the Lower Silesian group, where influences from Eastern Bohemia and Moravia can be observed. There are similarities between the Lower Silesian settlement cluster and the settlement from Upper Silesia, Western Lesser Poland, Moravia and Lower Austria, which is sometimes referred to as the »Boii zone« (cf. Venclová/Militký 2014), after the Celtic tribe of the Boii, which is believed to have lived in this area. These similarities can be sought for in some traits of funeral rites, in the manufacture of metal ornaments and dress parts, in pottery manufacture, and in local mintage. The finds of stone tools, which were made from the raw material whose only outcrop is located in Lower Silesia in the direct vicinity of the La Tène culture settlement, show that there must have been a local network of trade exchange, which extended as far as the northern part of the Moravian Gate. The distance between these areas as the crow flies is about 100 km, which allows us to assume that in communication conditions of those days (cf. Bochnak 2014, 187-189), it could be covered on foot even within four to five days (fig. 16). The hitherto lack of La Tène period artefacts made from quartz-sericite schists which would come from Lower Silesia, that is, the area where the deposits of this raw material are located, is very strongly influenced by a minor percentage of settlements which were examined by excavations. For the sake of comparison, about 25 features have been recorded so far at seven settlements of the Lower Silesian settlement cluster. In comparison with the state of research on Przeworsk culture settlement in the same territory (Pazda 1980, maps 2-5), this data is extremely sparse. On the other hand, it cannot be excluded that some stone artefacts made from the schists, which were discovered at a multi-cultural site in Radłowice (pow. oławski; woj. Dolnośląskie/PL; Pazda 1992) were in use in the La Tène period. However, this does not change the fact that to acquire clear evidence for this, it is necessary to carry out further research on the Celtic settlement in this region. This research should focus on the identification of new settlement sites.

Stone artefacts from quartz-sericite schists differ from other finds of this kind, which can be discovered in La Tène assemblages. They can be quite precisely identified even solely based on macroscopic observations. Due to this, they can be quite simple and certain evidence for the identification of trade networks maintained by Celtic inhabitants of the present Lower Silesia with their relatives from other parts of Central

## CATALOGUE OF FINDS

Samborowice (pow. raciborski; woj. śląskie/PL), site 13

1. Trench 1/15, feature 84, layer 88 (fig. 15, 1)  
Size: 3.2 cm/1.85-2.6 cm/0.6 cm; weight: 14.1 g

2. Trench 1/15, feature 84, layer 88 (fig. 15, 2)  
Size: 13.25 cm/5.2 cm/0.6-2.2 cm; weight: 168.3 g

3. Trench 1/17, feature 128, layer 133 (fig. 15, 3)  
Size: 12.7 cm/4.8-5.3 cm/1.45 cm; weight: 156 g

4. Trench 1/17, feature 128, layer 133 (fig. 15, 4)  
Size: 9.7 cm/1.1-2.5 cm/1.1-2.5 cm; weight: 61.5 g

Samborowice (pow. raciborski; woj. śląskie/PL), site 17

5. Trench 1/16, feature 1, layer 3 (fig. 15, 5)

Size: 7.05 cm/1.0-1.75 cm/1.7 cm; weight: 42.5 g

### Acknowledgements

This paper was prepared as part of a research project »Celtic borderlands? Studies on the settlement and economy of the La Tène Culture in Silesia« (2016/21/D/HS3/02886), funded by Narodowe

Centrum Nauki (the National Science Centre). – The excavations at sites 13 and 17 in Samborowice are co-funded by the Muzeum Śląskie w Katowicach (Silesian Museum in Katowice).

### References

Aleksandrowski/Mazur 2002: P. Aleksandrowski / S. Mazur, Col-lage tectonics in the northeasternmost part of the Variscan Belt: the Sudetes, Bohemian Massif. Geological Society London Special Publications 201, 2002, 237-277.

Bochnak 2014: T. Bochnak, Importy celtyckie w kulturze przeworskiej i oksywijskiej na ziemiach polskich w młodszym okresie przedrzymskim. Zróżnicowanie – drogi napływu – kontekst kulturowy (Rzeszów 2014).

Borowski 2014: M. Borowski, Wyniki badań petrograficznych materiałów kamiennych. In: M. Masojć (ed.), Obozowiska, osady, wsie. Wrocław – Widawa 17 (Wrocław 2014) 439-450.

Cholewa 2004: P. Cholewa, Rola sudeckiego zaplecza surowcowego w kamieniarstwie neolitycznym na Śląsku. *Studia Archeologiczne* 34 (Wrocław 2004).

Czerska 1959: B. Czerska, Osada z okresu późnolateńskiego koło Nowej Cerekwi w powiecie Głubczyce. *Archeologia Śląska* 3, 1959, 25-68.

1964: B. Czerska, Sprawozdanie z badań osady celtyckiej w Nowej Cerekwi, powiat Głubczyce w 1962 roku. *Sprawozdania Archeologiczne* 16, 1964, 124-131.

1976: B. Czerska, Osada celtycka koło wsi Nowa Cerekwia w powiecie Głubczyce w świetle najnowszych badań. *Studia Archeologiczne* 7, 1976, 95-137.

Dulęba 2010: P. Dulęba, Starsza faza kultury lateńskiej w Małopolsce Zachodniej [unpubl. PhD diss. Univ. Warsaw 2010].

Gebhard 1989: R. Gebhard, Der Glasschmuck aus dem Oppidum von Manching. *Die Ausgrabungen in Manching* 11 (Stuttgart 1989).

Gralak/Lisowska/Sadowski 2012: T. Gralak / E. Lisowska / K. Sadowski, Wyroby kamienne z osady z XII-XIII w. w Górcu, stanowisko 13, w powiecie strzelińskim na tle lokalnego zaplecza

surowcowego – serii łupków kwarcytowych z Jegłowej. *Śląskie Sprawozdania Archeologiczne* 54, 2012, 275-288.

Gunia 2010: P. Gunia, Charakterystyka petrograficzna późnośredniowiecznych zabytków kamiennych. In: J. Piekalski / K. Wachowski (eds), *Ulice średniowiecznego Wrocławia*. *Wratislavia Antiqua* 11 (Wrocław 2010) 347-354.

2012: P. Gunia, Charakterystyka petrograficzna zabytków kamiennych pochodzących z badań archeologicznych przy ulicy Katedralnej 4 we Wrocławiu. In: A. Pankiewicz (ed.), *Nowożytny cementarz przy kościele św. Piotra i Pawła na Ostrowie Tumskim we Wrocławiu (lata 1621-1670)*. *Wratislavia Antiqua* 17 (Wrocław 2012) 239-254.

2013: P. Gunia, Charakterystyka petrograficzna zabytków z wczesnośredniowiecznych stanowisk archeologicznych na Dolnym Śląsku. In: Lisowska 2013, 261-283.

Gunia/Lisowska 2013: P. Gunia / E. Lisowska, Zagadnienie pozyskiwania i rozprzestrzeniania się oselek z łupków kwarcowo-serycytowych ze Wzgórz Strzelińskich w starożytności i wczesnym średniowieczu. In: XVIII Śląskie Sympozjum Archeologiczne. Śląsk i Europa od pradziejów do współczesności – abstrakty (Wrocław 2013) 37-39.

Haevernick 1960: Th. E. Haevernick, Die Glasarmringe und Ring-perlen der Mittel- und Spätlatènezeit auf dem europäischen Fest-

Herz/Garrison 1998: N. Herz / E. G. Garrison, *Geological Methods for Archaeology* (Oxford 1998).

Jaworski 2008: K. Jaworski, Gdzie ta Jegłowa? Uwagi o wczesnośredniowiecznych śląskich osełkach wykonanych z pozyskiwanych na Wzgórzach Strzelińskich łupków kwarcowo-serycytowych. In: A. Błażejowski (ed.), *Labor et patientia*. *Studia archaeologica Stanisłao Pazda dedicata* (Wrocław 2008) 415-423.

- Jaworski/Wójcik 1997: K. Jaworski / A. Wójcik, Przedmioty wykonane z surowców skalnych z grodziska w Gilowie, woj. Wałbrzyskie. *Studia Archeologiczne* 29, 1997, 115-149.
- Kappel 1969: I. Kappel, Die Graphittonkeramik von Manching. Die Ausgrabungen in Manching 2 (Wiesbaden 1969).
- Karwowski 2004: M. Karwowski, Latènezeitlicher Glasringschmuck aus Ostösterreich. *Mitteilungen der Prähistorischen Kommission* 55 (Wien 2004).
- Kaźmierczyk 1990: J. Kaźmierczyk, Kamień w kulturze Ostrowa Tumskiego we Wrocławiu w wiekach X-XIII (Wrocław 1990).
- Kurtz 1936: H. Kurtz, Slawische Bodenfunde in Schlesien. *Schriften des Osteuropa-Institutes in Breslau: Neue Reihe* 5 (Breslau 1936).
- Lisowska 2010: E. Lisowska, Oseki. In: J. Piekalski / K. Wachowski (eds), *Ulice średniowiecznego Wrocławia. Wratislavia Antiqua* 11 (Wrocław 2010) 275-277.
- 2012: E. Lisowska, Średniowieczne i nowożytny wyroby z kamienia odkryte podczas badań przy ulicy Katedralnej 4 we Wrocławiu. In: A. Pankiewicz (ed.), *Nowożytny cementarz przy kościele św. Piotra i Pawła na Ostrowie Tumskim we Wrocławiu (lata 1621-1670). Wratislavia Antiqua* 17 (Wrocław 2012) 223-8.
- 2013: E. Lisowska, Wydobycie i dystrybucja surowców kamiennych we wczesnym średniowieczu na Dolnym Śląsku (Wrocław 2013).
- Madej/Wójcik 2003: S. Madej / A. Wójcik, Analiza petrograficzna zabytków kamiennych z badań ratowniczych na autostradzie A-4 na stanowisku Wilkowice 8. In: B. Gediga (ed.), *AZA. Zeszyt 2, Badania na autostradzie A-4, vol. I* (Wrocław 2003) 371-376.
- 2004: S. Madej / A. Wójcik, Analiza petrograficzna zabytków kamiennych z badań ratowniczych na autostradzie A-4 w Jaryszowie na stanowisku nr 10. In: B. Gediga (ed.), *AZA. Zeszyt 3, Badania na autostradzie A-4, vol. II* (Wrocław 2004) 247-249.
- 2007: S. Madej / A. Wójcik, Analiza petrograficzna wybranych zabytków kamiennych ze stanowiska Wojkowice 15, powiat wrocławski. In: B. Gediga (ed.), *AZA, Zeszyt 5, Badania na autostradzie A-4, vol. III* (Wrocław 2007) 331-334.
- Madej/Wójcik/Grodzicki 2003a: S. Madej / A. Wójcik / A. Grodzicki, Analiza petrograficzna zabytków kamiennych z badań ratowniczych na autostradzie A-4 na stanowisku Ślęza 11 i 12. In: B. Gediga (ed.), *AZA. Zeszyt 2, Badania na autostradzie A-4, vol. I* (Wrocław 2003) 67-70.
- 2003b: S. Madej / A. Wójcik / A. Grodzicki, Analiza petrograficzna zabytków kamiennych z badań ratowniczych na autostradzie A-4 na stanowisku Ślęza 13. In: B. Gediga (ed.), *AZA. Zeszyt 2, Badania na autostradzie A-4, vol. I* (Wrocław 2003) 485-489.
- Majerowicz 1970: A. Majerowicz, Petrograficzno-makroskopowe określenie zabytków kamiennych z wykopalisk we Wrocławiu, Czeladzi Wielkiej i Niemczy [unpubl. typescript, Instytut Archeologii i Etnologii Polskiej Akademii Nauk we Wrocławiu, archive, no. 122/68, Wrocław 1970].
- Majerowicz/Skoczylas/Wójcik 1999: A. Majerowicz / J. Skoczylas / A. Wójcik, Petroarcheologia i rozwój jej badań na Dolnym Śląsku. *Przegląd Geologiczny* 47, 1999, 638-643.
- Meduna 1980: J. Meduna, Die latènezeitlichen Siedlungen in Mähren.
- Michniewicz 1999: J. Michniewicz, Analiza petrograficzna przedmiotów kamiennych. In: C. Buško / J. Piekalski (eds), *Ze studiów nad życiem codziennym w średniowiecznym mieście: parcele przy ulicy Więziennej 10-11 we Wrocławiu. Wratislavia Antiqua* 1 (Wrocław 1999) 136-141.
- Oberc 1966: J. Oberc, Geologia krystaliczna Wzgórz Strzeleńskich. *Studia Geologica Polonica* 20, 1966, 1-187.
- Oberc-Dziedzic 2012: T. Oberc-Dziedzic, Geologia masywu strzeleńskiego: dlaczego musimy chronić geostanowiska? In: Tarka / Moskwa 2012, 4-12.
- Oberc-Dziedzic/Madej 2002: T. Oberc-Dziedzic / S. Madej, The Variscan overthrust of the Lower Palaeozoic gneiss unit on the Cadomian basement in the Strzelin and Lipowe Hills massifs, Fore-Sudetic Block, SW Poland: is this part of the East-West Sudetes boundary? *Geologia Sudetica* 34, 2002, 39-58.
- Pazda 1980: S. Pazda, Studia nad rozwojem i zróżnicowaniem lokalnym kultury przeworskiej na Dolnym Śląsku. *Studia Archeologiczne* 10 = *Acta Universitatis Wratislaviensis* 443 (Wrocław 1980).
- 1992: S. Pazda, Osada kultury lateńskiej w Radłowicach, gm. Domaniów, woj. Wrocław w świetle badań w latach 1964-1968. *Studia Archeologiczne* 22, 1992, 85-127.
- 1995: S. Pazda, Osada wczesnośredniowieczna na stanowisku nr 8 w Radłowicach gm. Domaniów, woj. Wrocławskie. *Studia Archeologiczne* 26, 1995, 209-245.
- Pazda/Sachanbiński 1991: S. Pazda / M. Sachanbiński, Problem eksploatacji, użytkowania i dystrybucji łupków kwarcytowych (kwarcowo-serycytowych) z rejonu Wzgórz Strzeleńskich jako surowca do sporządzania oselek na Śląsku w starożytności. *Studia Archeologiczne* 20, 1991, 47-73.
- Pescheck 1939: Ch. Pescheck, Die frühwandalische Kultur in Mittelschlesien (100 vor bis 200 nach Chr.). *Quellenschriften zur ostschlesischen Vorgeschichte* 10, 1939, 1-100.
- Petersen 1936: E. Petersen, Übersicht über die wandalischen Funde von Silingberge. *Altschlesien* 6, 1936, 229-232.
- Přichystal 2009: A. Přichystal, Kamenné suroviny v pravěku východní části střední Evropy (Brno 2009).
- Rapp 2009: G. Rapp, *Archaeomineralogy* (Berlin et al. 2009).
- Resi 1990: H. G. Resi, Die Wetz- und Schleifsteine aus Haithabu. *Archaeologia* 19, 1990, 1-19.
- 2008: H. G. Resi, Whetstones and grindstones used in everyday life at Kaupang. In: H. Askvik / H. G. Resi (eds), *Whetstones and grindstones in the settlement area; the 1956-1974 excavations. Kaupang-Funnene III C = Norske Oldfunn* 29 (Oslo 2008) 19-149.
- Sachanbiński 1978: M. Sachanbiński, Identyfikacja minerałów z wykopalisk na Ostrowie Tumskim [unpubl. typescript, Instytut Archeologii Uniwersytetu Wrocławskiego, Wrocław 1978].
- Sachanbiński/Kaźmierczyk 1988: M. Sachanbiński / J. Kaźmierczyk, Eksploatacja surowców skalnych na Wzgórzach Strzeleńskich we wczesnym średniowieczu. In: *Surowce mineralne w pradziejach i we wczesnym średniowieczu Europy Środkowej. Prace Komisji Archeologicznej* 6 (Wrocław et al. 1988) 157-172.



- Skoczylas 1993: J. Skoczylas, Petro-Archäologie? Was ist sie eigentlich? *Archeologia Polski* 38, 1993, 152-154.
- Štělcl/Malina 1975: J. Štělcl / J. Malina, Základy petroarcheologie. *Folia Facultatis Scientiarum Naturalium Universitatis Purkynianae Brunensis: Seria Monographia 2* (Brně 1975).
- Szczepański 2001: J. Szczepański, Warstwy z Jęglowej – zapis wielofazowej deformacji w strefie kontaktu Sudetów wschodnich i zachodnich (krystalinik Wzgórz Strzebińskich, blok przed-sudecki). *Przegląd Geologiczny* 49, 2001, 63-71.
- 2007: J. Szczepański, A vestige of an Early Devonian active continental margin in the East Sudetes (SW Poland) – evidence from geochemistry of the Jęglowa Beds, Strzelin Massif. *Geological Quarterly* 51, 2007, 271-284.
- Tarka/Moskwa 2012: R. Tarka / K. Moskwa, Walory przyrody nieożywionej Wzgórz Niemczańsko-Strzebińskich (Wrocław 2012).
- Venclová 1990: N. Venclová, Prehistoric glass in Bohemia (Praha 1990).
- 2016: N. Venclová, Němčice and Staré Hardisko. Iron Age glass and glass-working in Central Europe (Praha 2016).
- Venclová/Militký 2014: N. Venclová / J. Militký, Glass-making, coin-  
 and second centuries B. C. In: S. Hornung (ed.), *Produktion – Distribution – Ökonomie. Siedlungs- und Wirtschaftsmuster der Latènezeit. Akten des internationalen Kolloquiums in Otzenhausen, 28.-30. Oktober 2011. Universitätsforschungen zur prähistorischen Archäologie* 258 (Bonn 2014) 387-406.
- Wiśniewski 1999: A. Wiśniewski, Wyroby kamienne. In: C. Buško / J. Piekalski (eds), *Ze studiów nad życiem codziennym w średniowiecznym mieście: parcele przy ulicy Więziennej 10-11 we Wrocławiu. Wratislavia Antiqua* 1 (Wrocław 1999) 120-135.
- Woźniak 1970: Z. Woźniak, *Osadnictwo celtyckie w Polsce* (Wrocław, Warszawa, Kraków 1970).

### *Zusammenfassung / Summary / Résumé*

#### **Die Anfänge der Nutzung von Wetzsteinen aus Quarz-Serizit-Schiefer in Schlesien vor dem Hintergrund neuer Entdeckungen aus latènezeitlichen Siedlungen**

Ausgrabungen an zwei Fundstellen der Latènekultur in Samborowice, Oberschlesien, erbrachten Steinartefakte aus Quarz-Serizit-Schiefer. Lagerstätten dieses Minerals wurden bisher nur an einem Ort angetroffen, nämlich in einem Bergmassiv nahe Jęglowa in Niederschlesien. Die behandelten Funde wurden im Zusammenhang mit genau datierten Artefakten der Latènekultur entdeckt, wodurch die Anfänge der Nutzung von Quarz-Serizit-Schiefer ab der mittleren Latènezeit dokumentiert sind. Die Funde von Samborowice belegen das Bestehen von Kontakten und einem organisierten Austauschnetzwerk zwischen zwei örtlichen Gemeinschaften der Latènekultur. Dies ließ sich bislang nur schwer anhand von bekannten archäologischen Funden allein beweisen. Übersetzung: M. Struck

#### **The Beginning of the Use of Quartz-sericite Schist Whetstones in Silesia in the Light of New Discoveries from La Tène Culture Settlements**

During excavations at two sites of the La Tène culture in Samborowice, Upper Silesia, stone artefacts made from quartz-sericite schist were found. Deposits of this mineral are located in one place only, a hill massif situated in the vicinity of Jęglowa in Lower Silesia. The discussed finds were discovered within a context of precisely dated artefacts of the La Tène culture, which confirm the beginning of use of quartz-sericite schists as early as the onset of the Middle La Tène period. The finds from Samborowice are evidence for the existence of contacts and an organised exchange network between two local communities of the La Tène culture. This has been difficult to prove until recently on the basis of known archaeological finds.

#### **Début de l'utilisation des pierres à aiguiser en schiste à quartz-séricite en Silésie à la lumière de nouvelles découvertes des habitats de la culture de La Tène**

Lors de fouilles sur deux sites de la culture de La Tène à Samborowice, en Haute Silésie, des artefacts en pierre faits de schiste à quartz-séricite ont été découverts. Les gisements de ce minéral sont situés dans un seul endroit, un massif montagneux situé à proximité de Jęglowa en Basse-Silésie. Les découvertes présentées ont été mises au jour dans un contexte d'artefacts précisément datés de la culture de La Tène, qui confirment le début de l'utilisation des schistes à quartz-séricite dès le début de La Tène moyenne. Les trouvailles de Samborowice témoignent de l'existence de contacts et d'un réseau d'échange organisé entre deux communautés locales de la culture de La Tène. Cela a été difficile à prouver jusqu'à récemment sur la base de découvertes archéologiques connues. Traduction: L. Bernard

*Schlüsselwörter / Keywords / Mots clés*

Polen / Latènezeit / Schlesien / Petro-Archäologie / Wetzstein / interregionale Kontakte  
Poland / La Tène / Silesia / petroarchaeology / sharpening stone / interregional contacts  
Pologne / La Tène / Silésie / pétroarchéologie / pierre à aiguiser / échanges interrégionaux

**Przemysław Dułęba**

**Ewa Lisowska**

Uniwersytet Wrocławski  
Instytut Archeologii  
ul. Szewska 48,  
PL - 50-139 Wrocław



ewaliskamail@gmail.com

**Jacek Soida**

Muzeum Śląskie w Katowicach  
ul. T. Dobrowolskiego 1  
PL - 40-205 Katowice  
j.soida@muzeumslaskie.pl