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## Bracer ornaments! An investigation of Bell Beaker stone 'wrist-guards' from Central Europe

Clément Nicolas

### Abstract

This paper focuses on Bell Beaker stone bracers, so-called 'wrist-guards'. These objects have attracted attention for decades as symbols of warriorhood. As pointed out by various authors, such items appear to be rather bracer ornaments than proper wrist-guards for the protection of an archer's forearm. In this study, 153 bracers from the Czech Republic and Hungary have been investigated with a technological and functional approach in order to track the biography of these objects. It appears that, in this area, they are made of various sedimentary rocks. The manufacture of most bracers does not require a high-level of know-how, but some carefully made pieces could have been worked by craftsmen. The functional approach for an investigation of these objects reveals very few signs of their use as wrist-guards. However, these items are generally worn to various degrees and some of them have a quite long biography, having been consistently broken, re-shaped and re-drilled. An analysis of deposition contexts concludes that the bracers were items for personal adornment, with highly symbolic character and can be regarded as male-gendered objects. In this respect, they should be definitely considered as bracer ornaments rather than wrist-guards.

### Introduction

So-called archers' wrist-guards are emblematic objects of the Bell Beaker culture which spread throughout Europe towards the middle of the 3<sup>rd</sup> millennium BCE. These are small stone plaques, with perforations at both ends, which have long been interpreted as a form of forearm protection worn by archers, a hypothesis first forwarded by A.W.H. Ingram in the 1860s. Ingram (1867) observed that the objects were regularly found in burials, adjacent to the forearm of the deceased, and thus, by analogy with ethnographic sources, he identified them as archers' bracers. However, this interpretation has been questioned for several decades (for detailed references, see Fokkens et al. 2008). Recently, H. Fokkens and his colleagues (2008) noted in their article "Bracers or Bracelets? About the functionality and meaning of Bell Beaker wrist-guards" that the objects are generally found on the outside of the forearm; they based their observations on the plans of 31 Bell Beaker burials. This positioning of the objects tends to suggest that they served as ornamental elements on leather bracers. The best ethnographic parallels for this arrangement are undoubtedly Navajo *ketohs* which consist of perforated silver plaques attached to leather wrist-guards (*ibid.*). Historical and ethnographic research undertaken by the same authors highlights the fact that wrist-guards, regardless of the material they are made from, are not indispensable for the practice of archery. Often, they are invested

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with strong symbolic significance linked to virility and prowess in hunting and warfare. This symbolic aspect makes it difficult to interpret their function: "What is clear is that they can easily cross the border between functional tool and ornament, so whether a leather wrist-guard is a purely utilitarian tool, an ornamented tool (bracer), or 'only' an ornament (bracelet) may be very ambiguous" (Fokkens et al. 2008, 120).

The contexts analysed by H. Fokkens and his colleagues have not enabled us to move beyond this *status quo*. Were these wrist-guards archers' bracers, personal ornaments, or both at the same time? Recently, several functional analyses have been carried out in Great Britain (Woodward/Hunter 2011), Holland (van der Vaart 2009a) and Spain (Risch 2002; Delgado Raack 2008; Muñoz Moro 2017). The former two examined corpora of 74 and 15 pieces, respectively. They revealed significant use-wear (wear polishes and breakages) linked, in certain cases, to the wearing of the bracers, but did not reveal any evidence for their use as wrist-guards. Thus, they support the hypothesis that the bracers had an ornamental function. In Spain, it has long been held that small stone plaques bearing two holes may have been used for working metal as they are found in close association with daggers in Argaric tombs (Siret/Siret 1890). This interpretation has since been confirmed by analyses of use-wear and copper residues (Risch 2002; Delgado Raack 2008; Muñoz Moro 2017). However, this polishing or sharpening function of the objects is so far only recognised on the Iberian Peninsula.

These functional approaches have been augmented by a small number of experiments. The first of these was carried out by S. van der Vaart using two experimental pieces which were of average length (8.5 to 11 cm long) and quite fine (0.4 to 0.5 cm thick). The replicas were tested by three experienced archers who positioned them on the inside of their forearms. After two hours of use, all three concluded that the bracers were perfectly functional (van der Vaart 2009a, 30–31). More recently, Pedro Muñoz Moro undertook a larger-scale programme of experiments in which the two hypotheses (wrist-guards and polishers/sharpeners) were tested using fifteen replicas made of sandstone, schist and bone. This research confirmed that Iberian plaques, with perforations at the extremities, were used as sharpeners or polishers. For the first time, it also revealed marks linked to their use as archers' bracers which were consistent with marks found on an example from the archaeological record (Muñoz Moro 2017).

Today, thanks to these various studies, there is a repertoire of use wears that can substantiate a functional interpretation. With the aim of contributing to the debate on the functional and social status of 'wrist-guards', I have undertaken a study of these objects in Central Europe. This region has been chosen as the focus of the present study because of its importance in the context of the European Bell Beaker culture and, more particularly, because of the thousands of individual burials that are found there. These burials, which are often grouped together in cemeteries, have yielded a large corpus of material which provides a rich basis for observations regarding Bell Beaker bracers. Thus, 153 bracers from Bohemia, Moravia and Hungary have been examined. This study was completed by a bibliographical review for the entire upper valley of the Danube (Southern Germany, Austria, the Czech Republic, Hungary; see Appendix 2).

Beyond the question of function, the entire life stories of these objects have been considered, from their manufacture to their deposition. How were they made? Who made them? How were they attached? What purpose did they serve? Who wore them? What role did these bracers play in Bell Beaker society?

Some of these issues have been dealt with elsewhere, so in the following it will be attempted to summarise the key points and to develop them on the basis of the analysis of the Central European corpus.

### The Bell Beaker burials of Central Europe

On a European scale, Bell Beaker funerary practices are far from uniform, considering burials with or without wrist-guards. In Central Europe, individual burials predominate, but it is not rare to find two individuals or even up to five individuals buried together. Crouched inhumation burials are the most common burial type, but they can also co-exist with cremations (Endrődi 2013). A marked feature of the inhumations is the fact that they are clearly gendered: men are generally buried lying on their left side with the head to the north and facing east, while women are buried on their right side with the head to the south and also facing the east (Turek/Černý 2001). These burials are contained within rectangular or oval pits, which can be up to 1 metre deep where they are well-preserved. On several occasions, traces of wooden coffins or cists have been identified (Matějíčková/Dvořák 2012). In contexts where bone tends to survive well, recent excavations have allowed archaeologists to identify pits which resemble graves in both their form and contents, but which lack skeletal material indicating that they were probably cenotaphs (Peška 2013; Fojtík 2015). Certain burials appear to have been surrounded by ring-ditches, measuring 2 to 12 m in diameter, which may have delimited small mounds. Furthermore, in the early 20<sup>th</sup> century, the excavations carried out by I. L. Červinka (1910) in the forests of Moravia revealed the existence of cemeteries with mounds which could reach up to 15 m in diameter. Old reports (up to the 1960s) provide accounts of the discovery of isolated graves and small groups of tombs (see Annex 2). Where extensive areas have been excavated, Bell Beaker burials generally appear to be grouped together in cemeteries containing anything from ten to over a thousand graves. However, the same extensive excavations can also reveal isolated burials. In a gravel pit at Tišice (Bohemia), for example, rescue excavations carried out over an area of 2.5 km<sup>2</sup> revealed only two Bell Beaker burials, located more than 500 m apart (M. Kuna, pers. comm.).

An east-west gradient can be observed in burial practices: towards the west, inhumation burials predominate and cemeteries rarely contain more than 30 graves; towards the east, cremation burials are more frequent and even predominant with cemeteries that are larger (Endrődi 2013). In Moravia, the cemetery of Hoštice I contains 157 graves (Matějíčková/Dvořák 2012). In the Budapest region, the cemeteries of Szigetszentmiklós 'Felső Úrge-hegyi dűlő' and Budakalász 'Luppa-csárda' contain 219 and 1070 burials, respectively (Czene 2008; Patay 2013). Within cemeteries, strict gender grouping rarely occurs. The same is true of burials containing archery equipment (arrowheads, wrist-guards). Moreover, these 'warrior' graves rarely make up more than 10 to 15% of the total number of burials in a given cemetery. An exception is the Hulín 2 'Pravčice' cemetery, Moravia, where almost one-third of the graves have yielded archery equipment (13 out of 45 burials; 28.9%; Peška 2013). The cemetery is divided into three groups of burials, one of which contains nine aligned burials containing arrowheads and bracers (Fig. 1). This unusual layout seems to highlight the special status of the burials containing archery equipment.

From a chronological point of view, there are several regional classifications, each with its own subdivisions (Dvořák 1989; Heyd 2000; 2001; Endrődi 2013; Turek 2013). Three broad phases can be

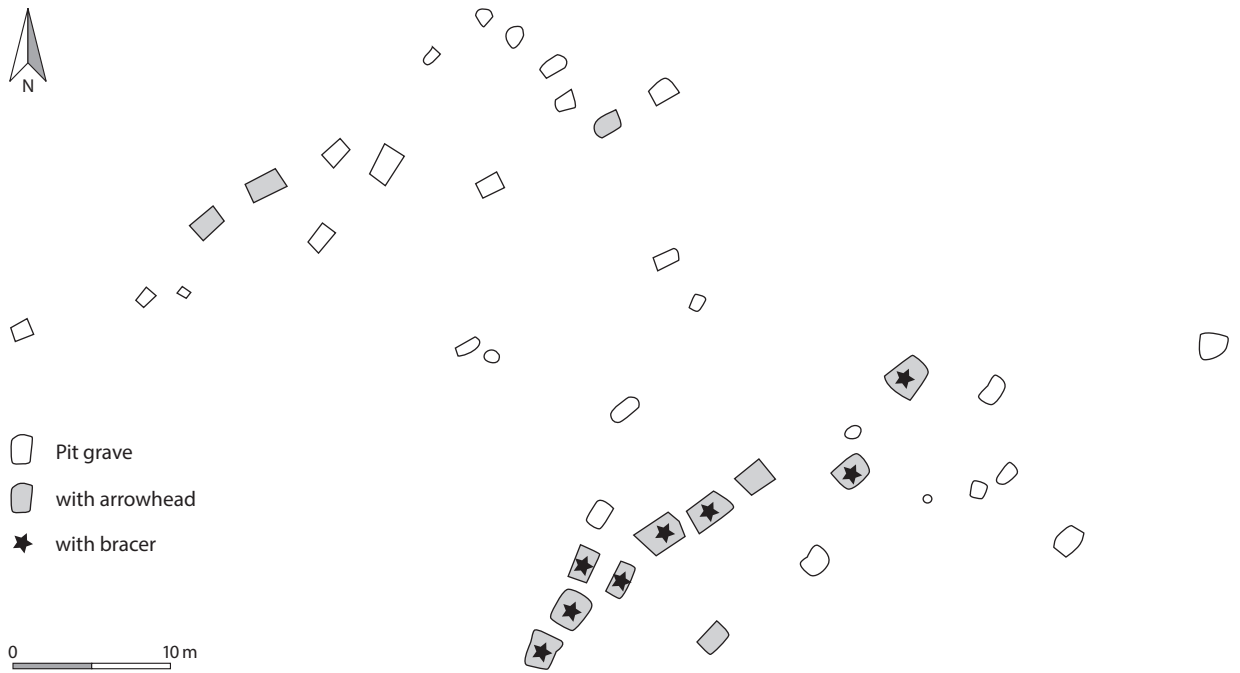


Fig. 1. The pit-grave cemetery of Hulín 2 'Pravčice', Olomouc, Moravia (after Peška 2013).

identified for Bell Beaker burials based on the beaker ceramic typology; the first is an international style, then regional styles and finally a production that is known as common ware (Besse 2003):

- Phase 1: tombs containing beakers of Maritime type (decorated with bands of alternating lines of hachures) and Epi-maritime type with only rare occurrences of common ware;
- Phase 2: tombs containing beakers decorated in various regionalised styles and common ware;
- Phase 3: tombs only containing common ware.

The identification of the first phase is further confirmed by the presence of other associated objects (Heyd 2001) and the 'Maritime' horizon is widely recognized elsewhere in Europe (Needham 2012; Salanova 2011). In contrast, the distinction between phases 2 and 3 is, in principle, more problematic because it is not based on a typological evolution of the beakers but rather on their presence or absence. Radiocarbon dating indicates that the Bell Beaker culture was relatively short-lived, spanning three centuries between 2500 and 2200 cal BCE. The imprecise nature of the radiocarbon dates neither confirms nor contradicts the relative chronology (Peška 2012). In any case, this system is widely accepted in Central Europe and has been used in the present study.

## Methodology

This investigation has been conducted with the aim of tracking the biographies of Bell Beaker wrist-guards, from the raw material to their final deposition, and the role they played in structuring the lives of their makers and users as stated by A. van Gijn (2010, 11). Such an undertaking requires an examination of various aspects of the wrist-guards from their process of production (raw materials, typology, and technology) to their use (use wear analysis) and their context of deposition.

Considering raw materials, the study mainly looked at the nature of the blanks (blocks, slabs or pebbles) and the selection of specific

colours. This benefited from the examination of a relevant sample in recent years by geologists, in particular by A. Přichystal (1992; 2000; 2013; Přichystal/Všianský 2012).

Concerning morphology and typology, the study is based on the works of E. Sangmeister (1964; 1974), who defined six types based on cross-section, the number of perforations (2 or 4), the shape of the longitudinal edges, and the presence of a flange at the extremities (Fig. 2). This typology has the merit of including most bracers, but also creates unclassifiable bracers (bracers with six holes, curved bracers with two holes, etc.) and will require revision in the future.

The technological approach has been considered by investigating each stage of production according to the concept of *chaîne opératoire* (Leroi-Gourhan 1964). Use-wear analysis, a method developed by S. Semenov (1964), is the reconstruction of the *chaîne opératoire* of manufacturing, use and abandonment. Moreover, skills in making wrist-guards have been estimated on the basis of repeated technical errors, the care given to general shaping, finishing or ornamentation and then put into perspective with previously made experimental replicas (Smith 2006; van der Vaart 2009a; 2009b).

Technological and functional analyses have been carried out with the naked eye, a camera (Canon Eos 450D) with two lenses (18–55 mm IS and EF 100 mm f/2.8 Macro USM) and a low magnification microscope (Leica EZ4 HD,  $\times 8$ – $\times 35$ ). Personal observations have been compared to previous studies, which include a large frame of reference and a catalogue of technical traces and use wears (van der Vaart 2009a; Woodward/Hunter 2011; Muñoz Moro 2017).

Finally, the deposition of bracers has been considered for graves and non-funerary deposits which offer the best contextual information, although few examples in settlements occur (Turek 2015).

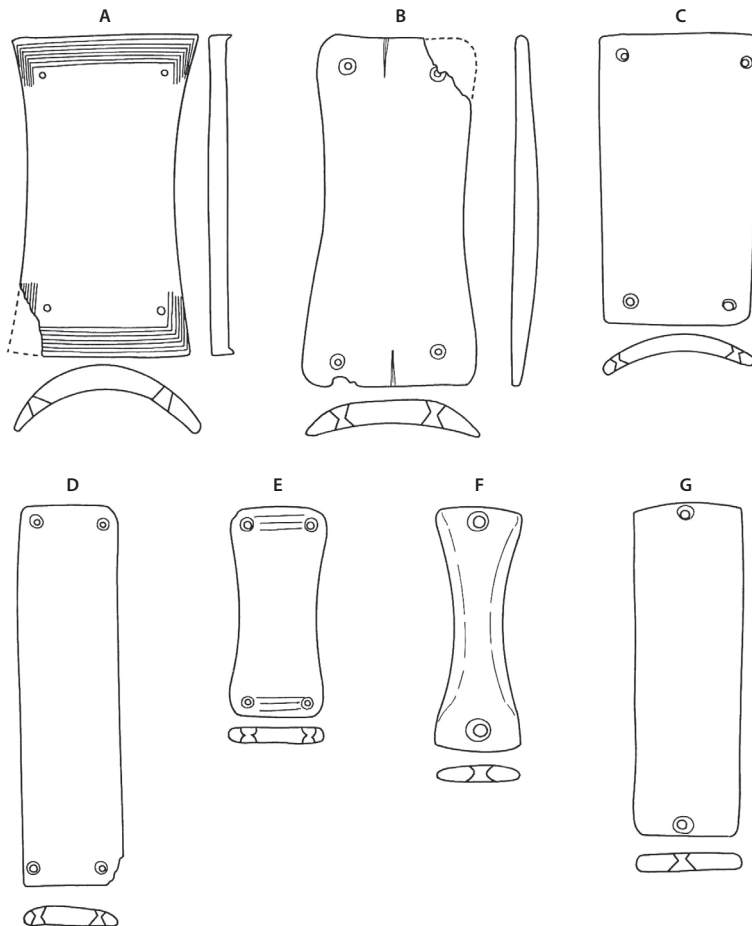


Fig.2. Typology of Central European bracers (after Sangmeister 1974).

Attention has been paid to the location of the wrist-guards in graves, especially the position on the skeleton following the studies conducted by Fokkens et al. (2008) and S. van der Vaart (2009a). A review of anthropological studies of individuals found in graves with wrist-guards allows an updated assessment of their sex, gender and age and therefore the identity of wrist-guard users.

### The corpus

Among the archery equipment deposited in Bell Beaker burials, bracers come after arrowheads in terms of the frequency with which they occur (Table 1). The study collates 297 bracers and 4 rough-outs from a total of 274 burials; of these, 146 bracers have been selected for detailed study (Fig. 3). All sites have been registered according to countries (A: Austria; CZ: Czech Republic; G: Germany; H: Hungary), numbered from 001 to n (see Appendix 2). To this number, seven bracers have been added from two non-funerary contexts. The buildings in which the bracers were found were recently excavated at Hostivice 'Palouky', Bohemia (Daněček et al. 2014) and at Brodek u Proštejova, Moravia (Fojtík 2015), both in the Czech Republic. A number of examples have been excluded where the discovery context is uncertain (old discoveries and surface finds) although certain examples that contribute significant information are cited.

Fig.3. Distribution map of Bell Beaker bracers from graves (black circles) in Central Europe and two ceremonial sites (white stars) at Hostivice (Bohemia) and Brodek u Proštejova (Moravia) (drawing: C. Nicolas).

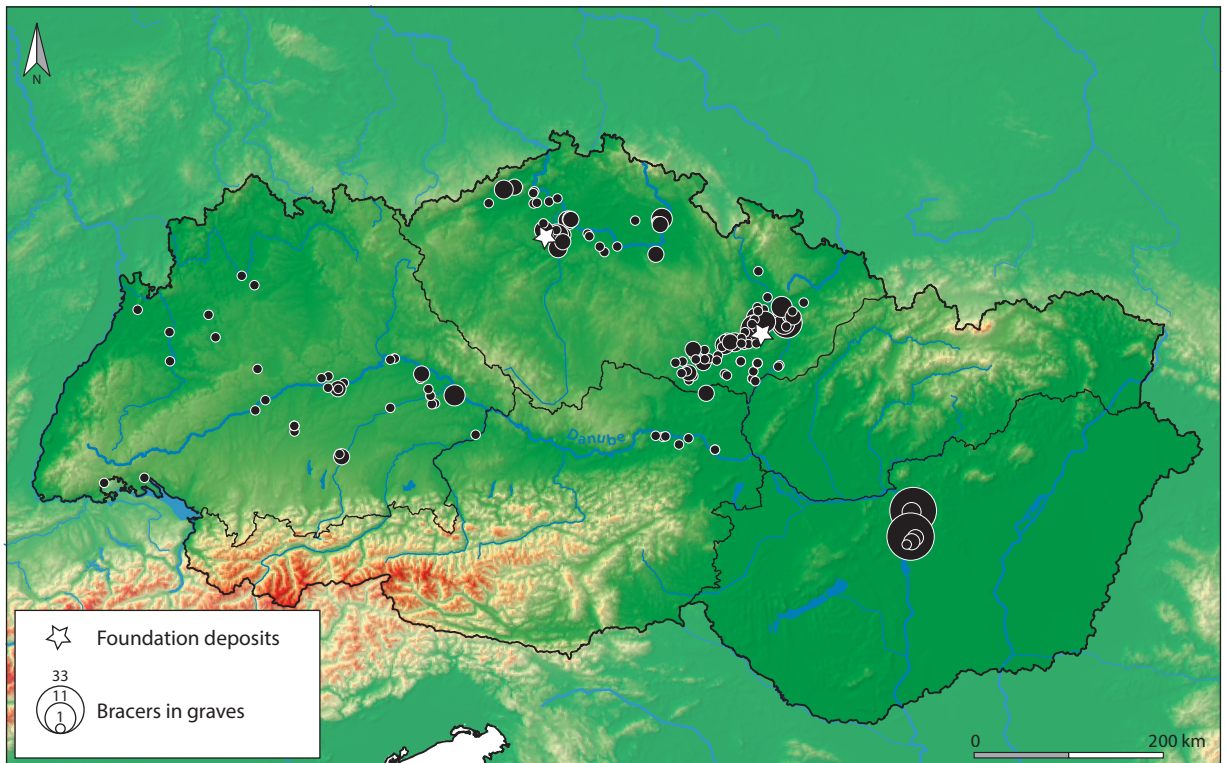


Table 1. Inventory of Bell Beaker bracers in Central Europe.

Country	Number of graves	Number of bracers	Number of rough-outs	Studied pieces
S. Germany	46	46	0	0
Austria	8	9	0	0
Hungary	73	77	0	32 (41.5%)
Czech Republic	147	165	4	114 (72.2%)
Total	274	297	4	146 (48.5%)

In Central Europe, bracers are, above all else, the subject of typological studies (Sangmeister 1964; Olivík 2009; Matějčková/Dvořák 2012). They have occasionally been subjected to petrographical analyses (Přichystal 1992; 2000; 2013, Přichystal/Všianský 2012). The only overall study of the biography of bracers was conducted by J. Turek (2004; 2015) on a corpus of objects from Northwestern Bohemia.

### Raw materials

The rocks used to manufacture bracers are generally of sedimentary type, a fact which does not facilitate their identification (Figs. 4–6). Only one piece, from grave 2 at Bylany I (Bohemia), was made from fibrous, blackish grey-green rock which might correspond to metabasite (A. Přichystal, pers. comm.; Fig. 6,12). Depending on their granulometry, these sedimentary rocks can be classified from sandstones to pelites, which can in turn be subdivided into siltstone, mudstone, claystone, etc.; there are also rare occurrences of schist. Pelites and sandstones are often banded and can have a calcareous, mica or muscovite component. This gives an impression of great diversity, suggesting exploitation of a multiplicity of raw material sources or rather various secondary deposits (e.g. river beds). The formation of these rocks goes back to the Primary (Devonian, Carboniferous, and Permian) and Tertiary geological periods, which could indicate that they were acquired locally and not necessarily imported from outside the region (Přichystal 1992; 2000; 2013; Přichystal/Všianský 2012; Turek 2004; 2015; A. Přichystal, pers. comm.). In all cases, when making bracers, the bearers of the Bell Beaker culture turned towards rock types that were relatively soft and easy to work. These pieces are generally heavily worked and leave little hint of the original

Fig. 4. Examples of bracer raw materials: (1) sandstone pebble, Prague 'Kobylis' XV, grave 11, Bohemia (CZ037; MHMP, no. A518450); (2) fine-grained sandstone pebble, Szigetszentmiklós 'Felső Űrgehegyi dúlő', grave 383, Hungary (H055; FM, no. 2009.11.383.3); (3) Culmian siltstone pebble, Hořtice IV, grave 841/02, Moravia (CZ126; MV, no. A34469); (4) a small plaque of purple schist, Vykan, Bohemia (CZ035; MČB, no. 27633) (photos: C. Nicolas).



blank from which they were made. A few crude examples were clearly made from pebbles (Fig. 4,1–3), which might indicate that at least some of the raw material was obtained from rivers. However, one example displays a rough irregular surface which suggests that a block or slab served as a blank (Fig. 4,4). The vast majority of these pelites and sandstones are variations, ranging from pale grey, brown, beige, yellow or ochre in colour (Fig. 5). Certain rocks appear to have been





Fig. 5. Bracers made from various sandstones and pelites: (1) pale grey pelite, Hulín 2 'Pravčice', grave H74, Moravia (CZ094; ACO, no. 04/2007–876-1); (2) beige, silicified aleurolite, Tišice, grave 77/99, Bohemia (CZ025; ARUP, no. 77–13); (3) very fine-grained Cretaceous sandstone, Libochovice II, grave 4 (CZ018; NM, no. 62989); (4) fine-grained, banded beige calcareous sandstone with muscovite, Hoštice I, grave 862/02, Moravia (CZ118; MV, no. A84644); (5) fine-grained, banded, beige sandstone, Prague 'Vršovice' IV, grave 4, Bohemia (CZ048; NM, no. 60343); (6) fine-grained, banded, beige sandstone, Modřice, grave 1/1990, Moravia (CZ068; MZMB, no. 09793–7/90); (7) reddish beige pelite, Hulín 2 'Pravčice', grave H74, Moravia (CZ094; ACO, no. 04/2007–876-4); (8) greyish-beige pelite, Mlékovice, grave 1, Bohemia (CZ017; RMK, no. 9125); (9) yellowish-beige, fine-grained, banded sandstone, Prague 'Lysolaje' III, grave 9, Bohemia (CZ041; NM, no. 70203); (10) greyish-brown fine-grained sandstone, Hulín 1 'U Isidor-ka', H95, Moravia (CZ086; ACO, no. 30/2004–1804-8); (11) greyish-brown pelite, Hodějice, Moravia (CZ116; MZMB, no. 66433); (12) reddish-brown banded pelite, Neratovice I, grave 1, Bohemia (CZ030; NM, no. 39777) (photos: C. Nicolas).



Fig. 6. Bracers made from white, black, red, purple and green stones: (1) calcareous sandstone, Prague 'Ruzyně', Bohemia, Czech Republic (CZ044; NM, no. 46282); (2) calcareous sandstone, Lochenice, grave 13, Bohemia (CZ005; MVCHK, no. 24/81–57); (3) black and green fine-grained, banded pelite, Prague 'Lysolaje' III, grave 10, Bohemia (CZ042; NM, no. 70208); (4) carboniferous black aleurolite, Štětí nad Labem, Bohemia (CZ021; RMT, no. 2874) (5) black pelite, Luleč, Moravia (CZ129; MV, no. A12706); (6) black, loamy, Culmian schist, Hoštice I, grave 939/02, Moravia (CZ124; MV, no. A84876); (7) purple pelite, Hulín 1 'U Isidorka', grave H95, Moravia (CZ086; ACO, no. 30/2004–1804-9); (8) permian, silicified, purple psammite (?), Souš, Bohemia (CZ034; RMT, no. 2446); (9) silicified argillite (?), Bílina VI, grave 3, Bohemia (CZ051; RMT, no. 1600); (10) red pelite, Předmostí, grave (?) 2, Moravia (MKP, no. 1601–63-10); (11) greyish-green pelite, Němčice nad Hanou, grave 33, Moravia (CZ104; MZMB, no. 66574); (12) greyish-green metamorphic rock (metabasite?), Bylany I, grave 2, Bohemia (CZ002; NM, no. 60258) (photos: C. Nicolas).

sought after because of their particularly striking colours (black, red, purple, green); e.g. Permian psammite, Devonian and Culmian schists (Fig. 6).

## Morphology, typology and chronology

In Central Europe, Bell Beaker bracers show a certain degree of variation in terms of their cross-section (flat or curved), the number of perforations (2 to 6), their overall shape (rectangular, trapezoidal or oval), the morphology of their edges (concave, rectilinear, convex) and the presence of decoration or flanges at their extremities. This diversity gives rise to a wide variety of forms ranging from simple examples, consisting of a flat pebble perforated with two holes, to more complex examples such as trapezoidal bracers with a concavo-convex profile to fit the forearm, featuring flanges and incised ornaments.

These various forms are accompanied by a high degree of diversity in terms of their dimensions. Bracers can vary in length from 3.7 to 15.8 cm, but the majority are between 6 and 14 cm in length (Fig. 7). Due to their curved cross-section, Sangmeister's types A, B and C are quite large (3–5 cm on average). Bracers with a flat cross-section are generally narrower: between 2.5 and 4 cm for examples with 4 holes (Sangmeister's types D and E) and between 1 and 3 cm for examples with 2 holes (Sangmeister's types F and G). The thickness of bracers varies – independent of type – from 0.3 to 1 cm.

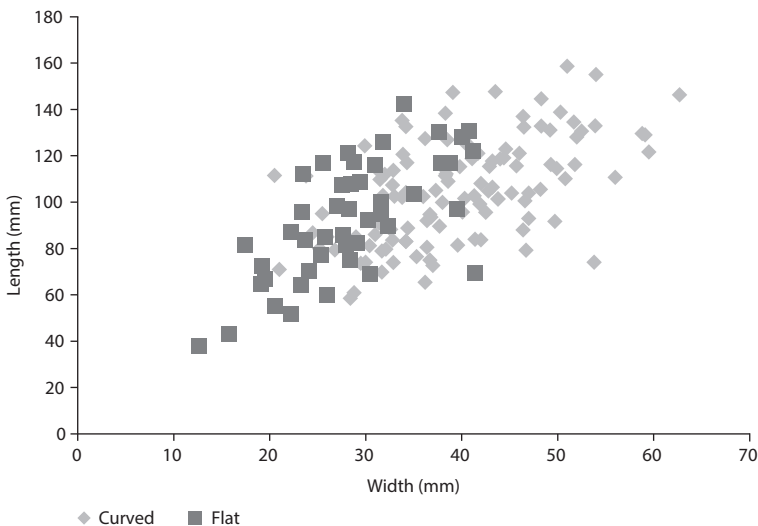
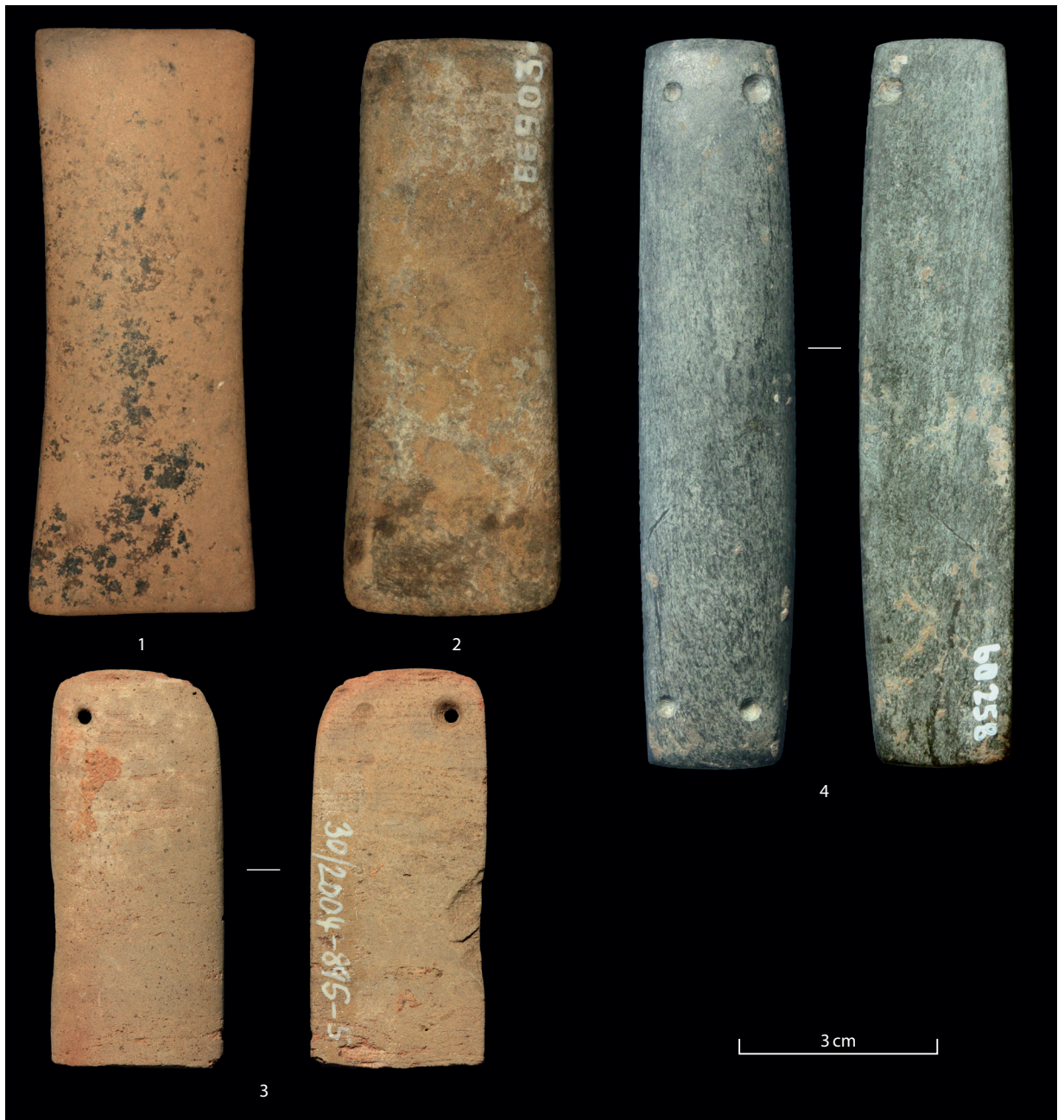


Fig. 7. Length vs. width of the studied bracers (Czech Republic and Hungary).

A minority of bracers bears engraved ornaments at their extremities (10.2%); these ornaments take the form of small cup-marks or incised linear grooves arranged in parallel or to form chevrons. Cup-marks could easily be differentiated from abandoned perforation: they are generally carefully made and always on the front face without opposite holes. They can occur singly or in a row, are generally found between the perforations or between the perforations and the short sides of the object. They can be very small and difficult to see with the naked eye or they can be as large as a perforation. The linear grooves are almost always grouped and parallel. They usually decorate the short sides, between the edges and the perforations; at the corners they sometimes criss-cross other parallel lines engraved at the extremities of the long sides. Sometimes the lines occur between the perforations where they evoke the cord that would have passed through the holes (Fig. 6,5,8).

Over time, the bracers became increasingly complex in form. In Phase 1, only bracers with a flat cross-section and two, four or six holes (types D and G) are known in Central Europe (Heyd 2001). Simple bracers with two perforations occur throughout the Bell Beaker



sequence and appear to have continued to be produced or at least circulated within the Únětice, Nitra and Chłopice-Veselé cultures (Ondráček/Šebela 1985; Bartelheim 1998; Podborský 1993). Furthermore, bracers with a flat cross-section and two perforations also appear to be the earliest types in the chronologies of Brittany (Nicolas 2016) and Great Britain (Woodward/Hunter 2011; Needham 2012) and they make up the majority of Bell Beaker bracers in Western Europe (Sangmeister 1964). In this area, these were the first type of bracers to have circulated with the diffusion of the Bell Beaker culture. In the absence of a prototype in Pre-Bell Beaker cultures, it appears to be impossible to identify any particular origin for the invention. In Phase 2, bracers with a curved cross-section (types B and C) appear in the record and become the standard product in Central Europe. The most elaborate bracers (type A) appear to be late. While they are rarely found in tombs, these items are most often associated with common ware (Phase 3; Hájek 1968, 3; Gauß 1963; Hille 2012, no. 811). One example of this type of bracer was found with a later

Fig.8. Bracer roughouts deposited in graves: (1) Brno 'Holásky' II, grave 35/38, Moravia (CZ060; MZMB, no. 16409); (2) Slavkov u Brna III, grave 8/04, Moravia (CZ134; MZMB, no. 66903); (3) Hulín 1 "U Isidorka", grave H85, Moravia (CZ085; ACO, no. 30/2004-895-5); (4) Bylany I, grave 2, Bohemia (CZ002; NM, no. 60258) (photos: C. Nicolas).

Table 2. Radiocarbon dates for burials yielding wrist-guards in Central Europe.

Site no.	Site	Lab no.	Sample	Date BP	Cal BC (95,4%)	Stage	Wrist-guard type
CZ144	Tvoříhráz, grave 2/91	Bln-4497	charcoal	3869 ± 40	2467–2208	1	D
		Bln-4498	charcoal	3746 ± 52	2335–1980		
		Bln-4499	charcoal	3771 ± 44	2339–2036		
		Bln-4500	charcoal	4011 ± 52	2850–2348		
		Bln-4501	charcoal	3838 ± 42	2462–2152		
CZ098	Záhlinice, grave 48/89	VERA-5230	human bone	3935 ± 40	2566–2297	1	D
CZ143	Těšetice-Kyjovice 'Sutny'	Poz-44322	dagger wooden sheath	3940 ± 40	2568–2299	2	C
H040	Szigetszentmiklós 'Felső Úrge-hegyi dűlő', grave 49	VERA-4749	human bone	3830 ± 40	2459–2148	2	B
H067	Szigetszentmiklós 'Felső Úrge-hegyi dűlő', grave 626	VERA-4757	human bone	3845 ± 35	2458–2204	2	C
CZ054	Radovesice-Bílina III, grave 53/80-II	KI-4449	?	3860 ± 40	2464–2206	3	B

type beaker, which would suggest a date towards the end of Phase 2 (Wagner 2011).

Few radiocarbon dates exist for burials yielding wrist-guards (Table 2). Half of them (5) have been made on charcoal samples from grave 2/91 at Tvoříhráz containing five cremations of immatures and point towards the second half of the 3<sup>rd</sup> millennium BC. The other half corresponds to radiocarbon dates of human bones or a dagger wooden sheath. They are more precise and indicate a time range from c. 2560 to 2200 cal BC, consistent with the Bell Beaker period in Central Europe. However, these radiocarbon results overlap much between typo-chronological stages (Peška 2012).

## Technology

The first steps of the manufacturing process (*chaîne opératoire*) are poorly represented. A small number of unpolished roughouts, as yet unperforated or in the process of being perforated, have been recovered from domestic and funerary contexts (Turek 2015; Fig. 8). The absence of flake scars suggests that the objects were not shaped using percussion, as appears to have been the case in Brittany (Nicolas 2016). In fact, deep parallel striations, running either diagonally across or longitudinally along the edges of several bracers seem to be more indicative of sawing rather than coarse abrasion (Fig. 9,6–7). Therefore, it seems likely that the first step in the shaping procedure involved sawing a pebble, block or slab to produce the required volume. The resulting rough-out would then be shaped by abrasion (Fig. 9,1). For more complex shapes with a strongly curved cross-section, this step would have constituted the bulk of the work and would have entailed the use of long, convex abraders. Then, fine abrasion, generally using a longitudinal movement, was employed to smoothen the surfaces (Fig. 9,2–4). Flat surfaces allowed longitudinal, transversal or diagonal movements, and often all three were used to avoid monotony in the gesture (Fig. 9,5). In general, greater attention was paid to the outer surface of the bracer with the result that the inner face sometimes retains traces of rough abrasion or may be left rough. The perforations are usually biconical but sometimes they are preferentially drilled from the inner face. In rare cases, the perforations are conical which causes chipping of the opposite



face during drilling (Fig. 10,1–3). In the case of biconical perforations, it was not always easy to line up the two drill holes. Thus, in some examples one or more attempted perforations were abandoned due to misalignment (Fig. 10,1–4). Striations around the perforation are usually very regular and perfectly circular undoubtedly indicating the use of a bow drill (Fig. 10,5–6).

Certain pieces are decorated with small cup-marks that were created in the same way as the perforations (Fig. 11,5–6). Others bear incised linear decoration (Fig. 11,1–4). This decoration could be added before or after perforation, without any evidence for a standard order (Fig. 11,1–4). Several examples suggest that these motifs were highlighted by inlays. Three bracers bearing linear ornament show evidence for white inlay although this is partially masked by concretions (Fig. 11,1–4; Fig. 12,1–2). The examples from Souš and Velké Žernoseky (Bohemia) are made of purplish stones, which must have created a similar effect to the beakers whose red colouring, obtained by oxidising firing, was enhanced by white

Fig. 9. Manufacturing striations on bracers: (1) abrasion on inner face, Štětí nad Labem, Bohemia (CZ021; RMT, no. 2874); (2) coarse polish on inner face, Tišice-Chrást I, grave 1, Bohemia (CZ026; NM, no. 90063); (3) medium polish on outer face, Předmostí, grave (?) 2, Moravia (CZ102; MKP, no. 1601–63-9); (4) fine polish on outer face, Hulín 2 'Pravčice', grave H74, Moravia (CZ094; ACO, no. 04/2007–876-1); (5) multidirectional polish on inner face, Předmostí, Grave (?) 1, Moravia (CZ101; MKP, no. 1601–63-12); (6–7) longitudinal and diagonal sawing striations, Szigetszentmiklós 'Felső Úrgehegyi dűlő', grave 49, Hungary (FM, no. 2009.11.49.3) (photos: C. Nicolas).

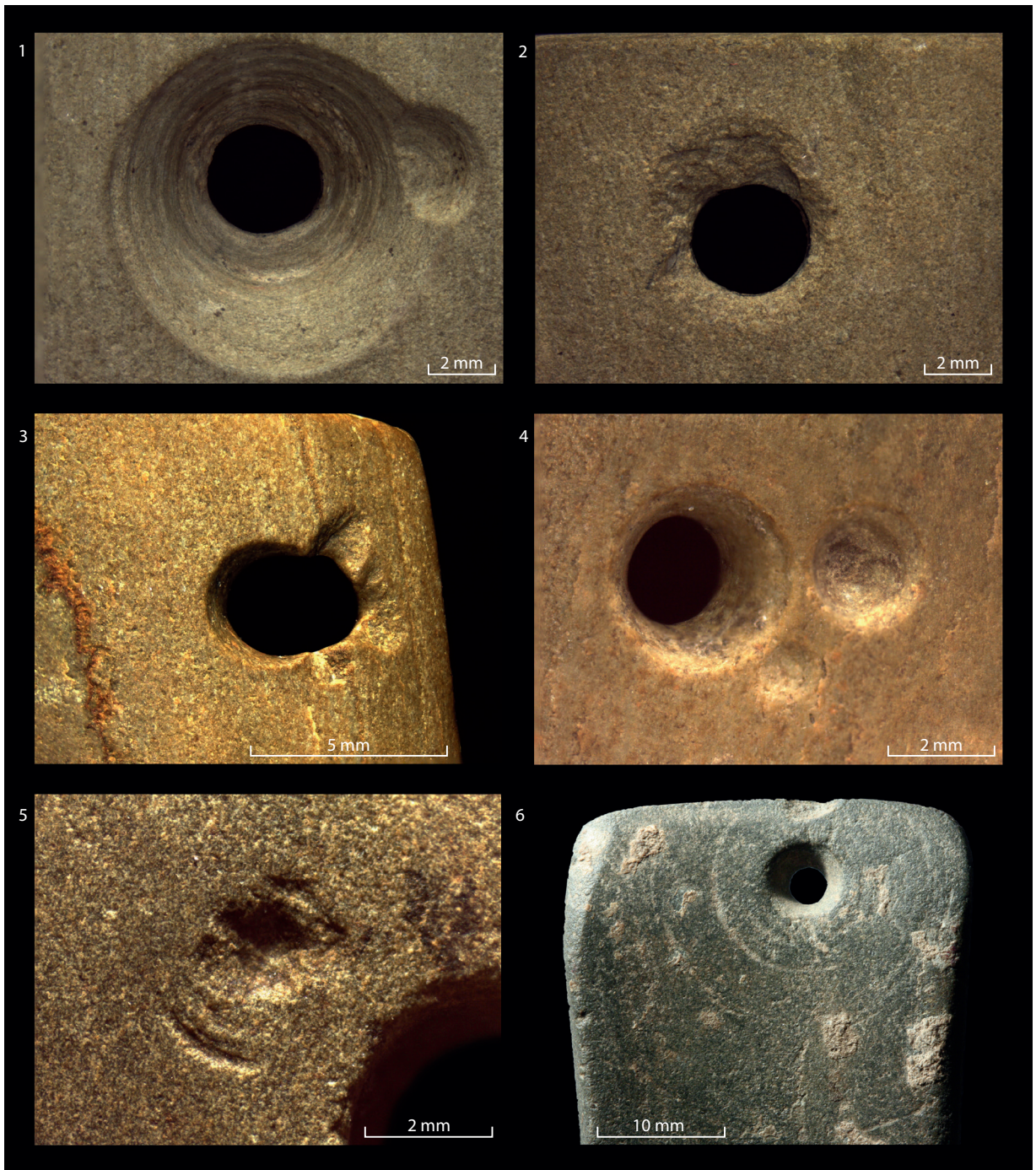


Fig. 10. Details of various bracer perforations: (1–2) abandoned perforation and completed conical perforation on inner face and chipped outline of perforation on outer face, Hoštice I, grave 915/02, Moravia (CZ122; MV, no. A84792); (3) biconical perforation with edge partly chipped during drilling, Hulín 2 'Pravčice', grave H59, Moravia (CZ091; ACO, no. 04/2007–861-3); (4) perforation and two abandoned perforations, Radovesice-Bílina III, grave 53/80-I, Bohemia (CZ053; RMT, no. 44524); (5) abandoned perforation with drilling striations, Radovesice-Bílina III, grave 53/80-II, Bohemia (CZ054; RMT, no. 44526); (6) large-diameter drilling striations, Třebovle, Bohemia (CZ016; RMK, no. 9127) (photos: C. Nicolas).

pigments (Všianský et al. 2014; Fig. 11,1–3; Fig. 12,1–2). Two other pieces each display a layer of black residue (charcoal?) within their single cup-mark (Fig. 14,3–4). Similar black inlays have been observed on Bell Beaker bow-shaped pendants made of boar tusks (Růžičková/Králík 2007). A final bracer shows evidence for a green resin-like substance in one of its two cup-marks (Fig. 14,5–6).



Fig. 11. Decorative details consisting of parallel lines and circular hollows: (1–3) detail of parallel lines created by grooving, Souš, Bohemia (CZ034; RMT, no. 2446); (4) parallel lines engraved after perforation, Luleč, Moravia (CZ129; MV, no. A12706); (5) decorative cup-marks between two perforations, Bohutice II, grave 1/50, Bohemia (CZ136; NM, no. 83042); (6) decorative cup-marks drilled above perforations, Svobodné Dvory, Bohemia (CZ010; MCVHK) (photos: C. Nicolas).





Fig. 12. Bracers with inlaid decoration: (1–2) whitish inlay within parallel grooves, Velké Žernoseky, Bohemia (Turek 2004; RMT, no. 13287); (3–4) blackish deposit at the base of a circular hollow, Hulín 1 'U Isidorka', grave H95, Moravia (CZ086; ACO, no. 30/2004–1804-8); (5–6) greenish resinous inlay filling a cup-mark, Ivanovice na Hané, grave 812/02, Moravia (CZ127; MV, no. A84644) (photos: C. Nicolas).

## Skill

The manufacture of most of the bracers does not seem to require any particular skill. Reproductions of the simplest flat-section bracers made of schist by novices suggest that such objects could be quite quickly produced, requiring 2 to 11 hours for completion (Smith 2006; van der Vaart 2009a; 2009b). For examples consisting of a simple flat perforated pebble, no more than an hour was required. However, for bracers with a curved cross-section, the hollowing out of the inner face represented a greater investment in terms of time

(ca. 21 hours of grinding and drilling the holes; van der Vaart 2009b). Sawing, abrading and polishing are time-consuming operations, but anyone with a basic level of manual dexterity could carry them out. The critical moment was undoubtedly the drilling of the perforations as evidenced by the regular occurrence of botched perforations. However, these attempts, which are often multiple, point to a lack of skill. There are a small number of cases that attest to the breaking of bracers during the drilling operation. However, this was not an insurmountable problem as the broken objects could be re-shaped. It is likely that everyone was capable of producing their own bracers, similar to arrowhead production (Nicolas 2017). However, this does not mean that everyone possessed the same level of skill and it is probable that different levels of skill are expressed in the regularity of the contours of the bracers and in the symmetry of the perforations. Furthermore, one cannot exclude that specific persons were in charge of the production of the bracers. A probable exception are the most complex Type A bracers which are trapezoidal, have a curved cross-section and feature ornamentation and flanges at the extremities (Fig. 6,8–9). Such pieces would have required a skilful mastery of the volumes of the rough-out in order to optimise the work time required. In particular, the symmetry of the shapes and the regularity of the engravings evident in certain examples would have required a certain mastery that could only have been acquired through experience. The production of these sophisticated bracers may, therefore, have been a preserve of a few experts or specialised craftspeople.

### Use-wear analysis

Use-wear analysis of bracers enabled the recognition of several elements of their life history. The main evidence is represented by traces of wearing, attachments and repeated breaks. Furthermore, evidence of heating and ochre-staining in the course of the life cycle of the bracers has been recognized. Finally, possible use-wear, resulting from the protection of archers' forearms, is considered.

### Worn bracers

Several former studies have revealed traces of use linked to the wearing of the bracers. These traces include wear on the edges of the bracers and perforations (van der Vaart 2009a; Woodward/Hunter 2011; Nicolas 2016). These traces of wear are generally matt and are limited to the edges of both faces. When they are well-developed, the traces can extend slightly onto the faces of the object and take on a shiny aspect. Use-wear is even more noticeable when it occurs on an un-polished or slightly polished surface, particularly on the raw edges of a break (Fig. 13,1–2). Traces of wear can successively cover chips or breaks or can be cut by them (Fig. 13,3–4). Under low magnification, traces of wear appear similar whatever their location (around the perforations or on the outer and inner edges). Without long-term experimentation, it is difficult to determine the wear mechanisms. It can be expected that it results from rubbing against various materials: for instance, threads, especially on perforations, contact with skin or an organic cuff (e.g. leather) for the inner face.

S. van der Vaart (2009a), A. Woodward and J. Hunter (2011) classed bracers in terms of four degrees of wear: fresh, slightly worn, worn, and very worn. However, this subjective classification appears to be difficult to apply according to A. Woodward and J. Hunter (2011, 79).

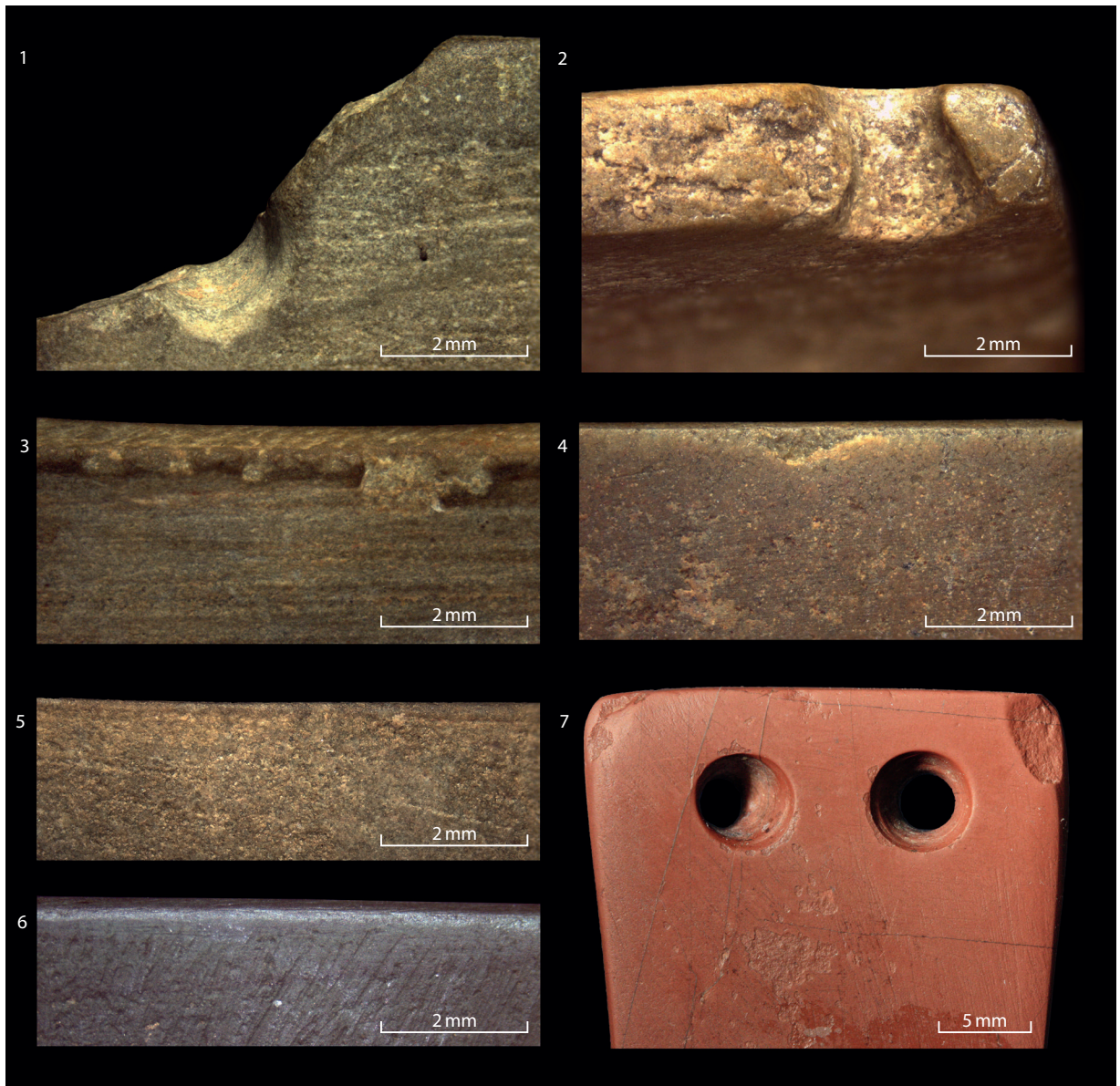


Fig. 13. Wears on bracer edges: (1) inner face, broken and very worn perforation, Stehelčevy III, grave 1, Bohemia (CZ012; VMS, no. 57.1–62); (2) broken and very worn perforation, Radovesice-Bílina I, grave 53/80-I, Bohemia (CZ053; RMT, no. 44524); (3) inner face, worn edge with fresh chipping, Most VI, grave 1, Bohemia (CZ033; MM, no. 336/27); (4) inner face, worn edge with worn chipping, Hodějice, Moravia (CZ116; MZMB, no. 66433); (5) inner face, slightly worn edge, Březno 'Čachovice', grave 90B, Bohemia (CZ001; OMC, no. 8/82–6); (6) inner face, worn edge, Prague 'Lysolaje III', grave 10, Bohemia (CZ042; NM, no. 70208); (7) inner face with macroscopic wears of the edges, Předmostí, grave (?) 2, Bohemia (CZ102; MKP, no. 1601–63-10) (photos: C. Nicolas).

For this reason, a scale for observations has been adopted here using the terms 'slightly worn' when the wear is discernible using a low magnification microscope ( $\times 8$  to  $\times 35$  magnification), 'worn' when it is clearly visible using a low magnification microscope, and 'very worn' when it is visible to the naked eye (Fig. 13,5–7). In the course of the study, no 'fresh' or new bracers have been observed; in all cases at least some wear was discernible. A significant proportion of the bracers ( $n = 38$ ; 26.7%) did not reveal visible wear due to the erosion of the surface of the raw material or the presence of concretions. The majority of the bracers were 'slightly worn' ( $n = 62$ ; 43.7%) or 'worn' ( $n = 38$ ; 26.7%). 'Very worn' examples ( $n = 4$ ; 2.8%) were very rare. These proportions are similar to those observed in Britain (Woodward/Hunter 2011).

## Broken and occasionally re-shaped bracers

Only a minority of the bracers are intact, most being damaged to a greater or lesser degree (see Appendix 3; Fig. 14). The breakage phenomenon is spread evenly across all types of bracers, be they curved or flat in cross-section. These breaks might be due to thermal or taphonomic alterations or to excavation conditions, but in most cases the damage occurred during the lifetime of the bracer (Fig. 15). Old breaks, which are recognisable by their worn edges, generally concern the corners of the bracers and chipped edges (Fig. 14). Such damage may have been caused by the impact of a bow string, the wearing of the bracer, or, as was demonstrated by J. Smith (2006), by its having been dropped onto a hard surface. Certain pieces, with two or more damaged corners, may have become difficult to attach to the forearm (Fig. 16,4–9). In order to remedy this, a certain number (13) were re-worked by grinding the broken edges and, where necessary, by the drilling of new perforations (Fig. 16,1–4). Sometimes this drilling caused new breaks (Fig. 16,6). Some pieces with only one surviving perforation could, at best, have been worn as pendants (Fig. 16,5–9). Such bracers are also known in Britain and may have been conserved as 'relics' (Woodward/Hunter 2011).

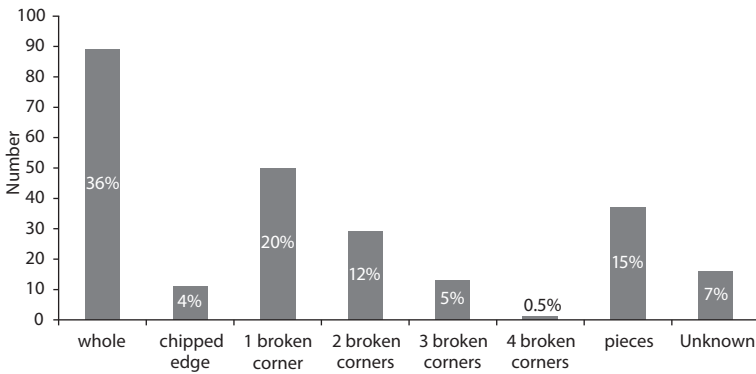


Fig. 14. The state of bracers deposited in graves.

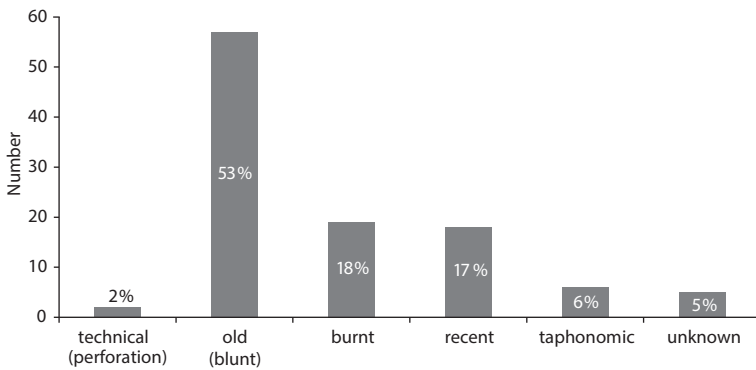


Fig. 15. Origin and freshness of breaks on bracers deposited in graves.



Fig. 16. Examples of broken and often reworked bracers with a long life story: (1) bracer with two broken corners and re-drilled perforations, Radovesice-Bílina III, grave 53/80-I, Bohemia (CZ053; RMT, no. 44524); (2) bracers with four broken corners and re-drilled perforations, Szigetszentmiklós 'Felső Úrge-hegyi dűlő', grave 107, Hungary (H043; FM, no. 2009.11.107.7); (3) reworked half bracer, with two broken corners, re-perforated and finally burnt, Bohutice II, grave 1/50, Bohemia (CZ136; NM, no. 83043); (4) broken bracer lacking context, reworked and perforated several times, Velké Žernoseky, Bohemia (Turek 2004; RMT, no. 13287); (5) bracer extremity with a new perforation and conserved in this condition, Ondratice I, grave 1/1900, Moravia (CZ109; MZMB, no. 66967); (6) bracer extremity, broken several times, re-perforated twice and conserved in this condition, one of the perforations appears to have caused the V-shaped break at the proximal end, Stehelčevy III, grave 1, Bohemia (CZ012; VMS, no. 57.1–62); (7) bracer conserved as a fragment, Zešov, Moravia (CZ111; MGP, no. 041572/14); (8) re-worked half bracer, one corner broken, finally burnt, Prague 'Lysolaje' III, grave 6, Bohemia (CZ040; NM, no. 15772); (9) broken bracer, partially reworked at one end and conserved as such, Neratovice, Bohemia (CZ029; NM, no. 18617) (photos: C. Nicolas).

### Attachment of the bracers

The large range of bracer types and also the presence of decoration imply that there were different methods of attachment particularly in terms of the threading of the cords. This diversity may be further increased due to breakages and reworking which could significantly alter the morphology of the objects (see above). Traces of wear on the perforations rarely provide directional information. It can be hypothesised that, once attached, there was little rubbing between the bracer and the cords used to tie it in place. Nonetheless, surviving evidence indicates several configurations for the attachment of four-holed bracer types:

- The first configuration consists of passing the cord from the under-side of the bracer, first through one perforation, running it across the outer surface of the bracer and then passing it back

through the second perforation so that it emerges once again on the under-side (Fig. 17,1). This mode of attachment is attested to by a linear zone of over-polish between the two perforations on the outer surface of the bracer (Fig. 18,1–2). In the same way, a piece from Poláky (Bohemia) displays a worn groove between the two holes on its outer face (Turek 2004). This method of tying is also confirmed by an English example from Hemp Knoll, which also displays linear wear-marks between the perforations (Woodward/Hunter 2011, no. 7).

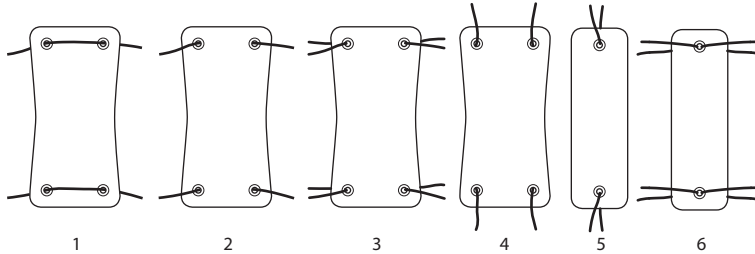


Fig. 17. Various methods to attach bracers (drawing: C. Nicolas).

- The second configuration is the converse of the first where the cord was passed across the underside of the bracer (Fig. 17,2). The exceptional example from grave 812/02 at Ivanovice na Hané (Moravia) retains a fragment of the cord which was preserved due to copper oxides that formed on a dagger which was in contact with the bracer (Matějčková/Dvořák 2012). The cord, which was made of plaited strands, was passed from the outer face through the first perforation, then passed across the underside of the bracer before being threaded through the second hole (Fig. 18,3–4). Another example from grave H59 at Hulín 2 'Pravčice' (Moravia) has two perforations which, on the outer surface of the bracer, exhibit wear on their outer sides, suggesting the same method of attachment (Fig. 18,5–6). Furthermore, these two bracers are decorated with cup-marks between the perforations; this mode of attachment would have avoided masking the ornamentation.
- The third arrangement involved passing the cord through each perforation and doubling it back on itself (Fig. 17,3). The bracer from grave H59 at Hulín 2 'Pravčice' could also correspond to this method of attachment (Fig. 18,5–6).
- A fourth possibility is highlighted by a bracer from grave 196 at Budakalász 'Luppa-csárda' (Horváth 2017). On its inner face, two longitudinal grooves link the proximal and distal perforations (Fig. 17,4). These grooves appear to have been created in order to facilitate the passage of the cord longitudinally on the underside of the bracer. An identical example was found in a cist burial at Newlands in Scotland (Woodward/Hunter 2011, no. 90).
- Finally, it is worth noting that in Great Britain certain four-holed bracers were attached using gold or copper alloy rivets (Smith 2006, Woodward/Hunter 2011, no. 8, 13, 79 and 89).

For two-holed bracers, there are fewer possibilities. A few pieces display preferential wear towards the short sides of the bracer indicating that the cords were attached longitudinally (Fig. 18,7–8). Elsewhere in the Netherlands, two-holed bracers appear to have been attached transversally (van der Vaart 2009a; Fig. 17,6).



Fig. 18. Evidence for several methods of bracer attachment: (1–2) linear over-polishing between two perforations on the outer surface, Prague 'Kobylis' VI, grave 1, Bohemia (CZ036; NM, no. 88838); (3–4) remains of a plaited cord preserved due to the presence of copper oxides and indicating that the cord was passed beneath the bracer through the two perforations, Ivanovice na Hané, grave 812/02, Moravia (CZ127; MV, no. A84644); (5–6) outer face of bracer showing a perforation with uneven wear towards the outside, Hulín 'Pravčice' 2, grave H59, Moravia (CZ091; ACO, no. 04/2007–861-3); (7–8) inner face of bracer with shiny wear on the distal edge side of perforation, Rosnice, grave I/59, Bohemia (CZ007; MVCHK, no. 24044) (photos: C. Nicolas).

Therefore, there appears to have been no hard and fast rule regarding the attachment of bracers. Instead, we see a significant degree of diversity depending on the morphology of the bracers and cultural factors. As suggested by H. Fokkens and his colleagues (2008), it appears that these stone plaques were affixed to bracers made of perishable materials (leather, textiles, etc.); this hypothesis is particularly supported by the riveted bracers found in Britain and might be congruent with wear on the inner faces of the bracers (Fig. 13).

Certain bracers displaying considerable re-working must have necessitated more individual methods of attachment. Although out of context, the broken bracer from Velké Žernoseky (Bohemia), which had been re-shaped and perforated several times, only retained two diagonally opposed holes in its final form (Fig. 16,4), which would not have permitted it to be attached in such a way that would have respected its long axis. Such broken bracers could still be worn on the forearm, as attested by the three-holed fragment from grave 30 at Mochov (Bohemia; Fig. 19). Some pieces, however, only survive as re-worked broken half-bracers, with one or two perforations at one end only (Fig. 16,5–9). Such pieces were either conserved like this or were worn as pendants. An unusual example from Tomb 81 at Prague 'Velká Chuchle' (Bohemia) displays two notches on its broken end to allow it to be attached; this system of attachment is attested elsewhere within the Nitra culture (Ondráček/Šebela 1985).

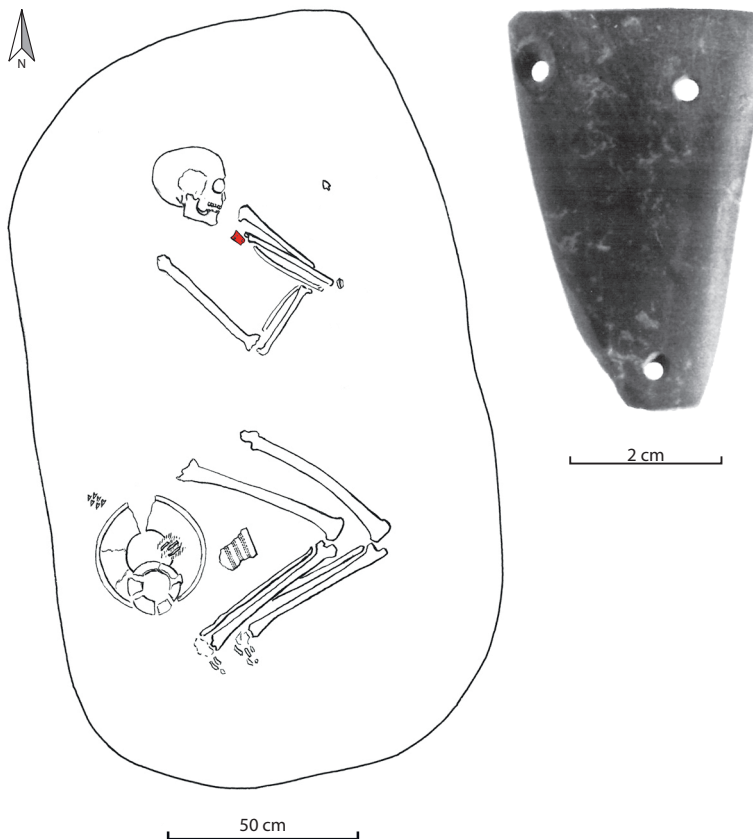


Fig. 19. Re-worked bracer from grave 30 at Mochov (Bohemia; CZ050) in position on the left forearm (after Moucha 1972).

### Burnt bracers

About forty bracers show evidence of some degree of burning. Most (20; 52.6%) are from cremation burials and it is reasonable to think that these objects were burnt with the deceased during the funeral rite. Not all of the bracers associated with cremations show evidence of thermal alteration. Burnt or not, the bracers were



generally placed in the tomb along with the burnt bones. This arrangement suggests that the deceased was wearing the bracer during the cremation, probably on the forearm as in inhumation burials. Nonetheless, several burnt bracers have also been found in pits without human remains which probably functioned as cenotaphs (Fig. 20,4–5). In these cases, the burnt bracers were probably the result of a sacrifice by burning or they may be cases of symbolic cremation. More unexpectedly, seven burnt bracers have been found in inhumation burials. In three instances, heat hollows, sometimes associated with a surface flaking affect, marked the surfaces of the bracers. Of these three, two display wear on the heat hollows, which indicates that the fire damage took place before or during the use-life of the object (Fig. 20,1–2). There seems to be no technological justification for this burning of the finished bracer. Finally, the four remaining bracers have been severely broken by the fire and thus probably indicate a sacrificial gesture. Despite the damage, one of these bracers was symbolically deposited on the left forearm of the deceased (Fig. 20,3).



Fig. 20. Bracers that were burnt before being deposited in graves: (1–2) general view and detail of a bracer with worn heat hollows on both faces, Prague 'Letná', Bohemia (CZ039; MHMP, no. P3553); (3) badly fire-shattered bracer arranged on the forearm of an inhumed individual, Szigetszentmiklós 'Felső Úrge-hegyi dűlő', grave 626, Hungary (H067; FM, no. 2009.11.626.5); (4–5) fire-shattered bracers deposited within a cenotaph, Brodek u Proštejova, 'grave' K522/H1, Moravia (CZ106; ÚAPPB, no. 287108a & b) (Bracer photos: C. Nicolas; photo of burial: R. Patay).

## Ochre-stained bracers

At least seven bracers from three cemeteries bear traces of ochre, either in the form of streaks or residual spots which are quite difficult to see (Fig. 21). The bright reddish ochre most often occurs on the underside of the bracers, close to the perforations (Table 3; Fig. 21,1–3). One notable example displays two parallel lines of ochre at the centre of its inner face (Fig. 21,1; 22,1–2). When concretions are present, the ochre is found overlying these deposits and not underneath them (Fig. 22,4). These distribution patterns appear to weaken the argument that the ochre was decorative, since it is generally the hidden face of the bracer that bears ochre; at least, this is the face on which the ochre best survives. The fact that the ochre overlies the concretions might indicate that it was applied to the bracer after the object had been deposited in the tomb. In such a case, it may be considered that the ochre was deposited on the wrist-guard upon contact with the deceased's body or clothing. However, the regular distribution of the ochre (inner surface, close to perforations) and the fact that in some cases a deliberate organization of the ochre could be observed (parallel lines; Fig. 21,1–2) indicate that these are not natural deposits originating from elements in the soil. Ochre residues have also been observed on three Dutch bracers. In the best-preserved example, the patch of ochre is once again located on the underside of the bracer, close to a perforation (van der Vaart 2009a). Traces of ochre on Bell Beaker bow-shaped pendants have been also mentioned (Růžičková/Králík 2007). In a hypothesis of indirect deposition, the ochre could originate from dyes used to colour textiles or leather in contact with the bracer or even the deceased's body. However, one cannot exclude other possible explanations linked to the burial ritual or to the manufacture of the bracers. In certain present-day societies in Irian Jaya (Indonesia), for example, red ochre, symbolising blood, is applied to axe blades before and after hafting in order to 'give them life' (Pétrequin/Pétrequin 2000, 250).

Table 3. Location of ochre traces on the bracers.

Grave	Id No.	Location of the ochre
Hulín 1 'U Isidorka', grave H85, Moravia	ACO, no. 30/2004–895-5	Broken rough-out with ochre on both faces of its extremity
Hulín 1 'U Isidorka', grave H95, Moravia	ACO, no. 30/2004–1804-8	Lower face: several traces on the surface and particularly near one of the perforations
Hulín 2 'Pravčice', grave H45, Moravia	ACO, no. 04/2007–847-4	Upper face: several traces at one extremity
Szigetszentmiklós 'Felső Űrgehegyi dűlő', grave 76–77, Hungary	FM, no. 2009.11.76.14	Lower face: two parallel lines of ochres at the centre, several traces around the perforations
Szigetszentmiklós 'Felső Űrgehegyi dűlő', grave 374, Hungary	FM, no. 2009.11.374.1	Lower face: one trace on a concretion near one of the perforations
Szigetszentmiklós 'Felső Űrgehegyi dűlő', grave 385, Hungary	FM, no. 2009.11.385.1	Lower face: several traces on a surface bearing concretions, near a perforation
Szigetszentmiklós 'Felső Űrgehegyi dűlő', grave 433, Hungary	FM, no. 2009.11.433.9	Lower face: several traces on surfaces bearing concretions around the perforations and at the centre of the object



Fig.21. Examples of bracers with ochre staining on their inner face (the arrows indicate the areas of ochre): (1) several lines and diffuse patches of ochre, Szigetszentmiklós 'Felső Űrge-hegyi dűlő', grave 76–77, Hungary (H041; FM, no. 2009.11.76.14); (2) several ochre deposits, Hulín 1 'U Isidorka', grave H95, Moravia (CZ086; ACO, no. 30/2004–1804-8); (3) ochre deposits on concretions, Szigetszentmiklós 'Felső Űrge-hegyi dűlő', grave 433, Hungary (H060; FM, no. 2009.11.433.9) (photos: C. Nicolas).

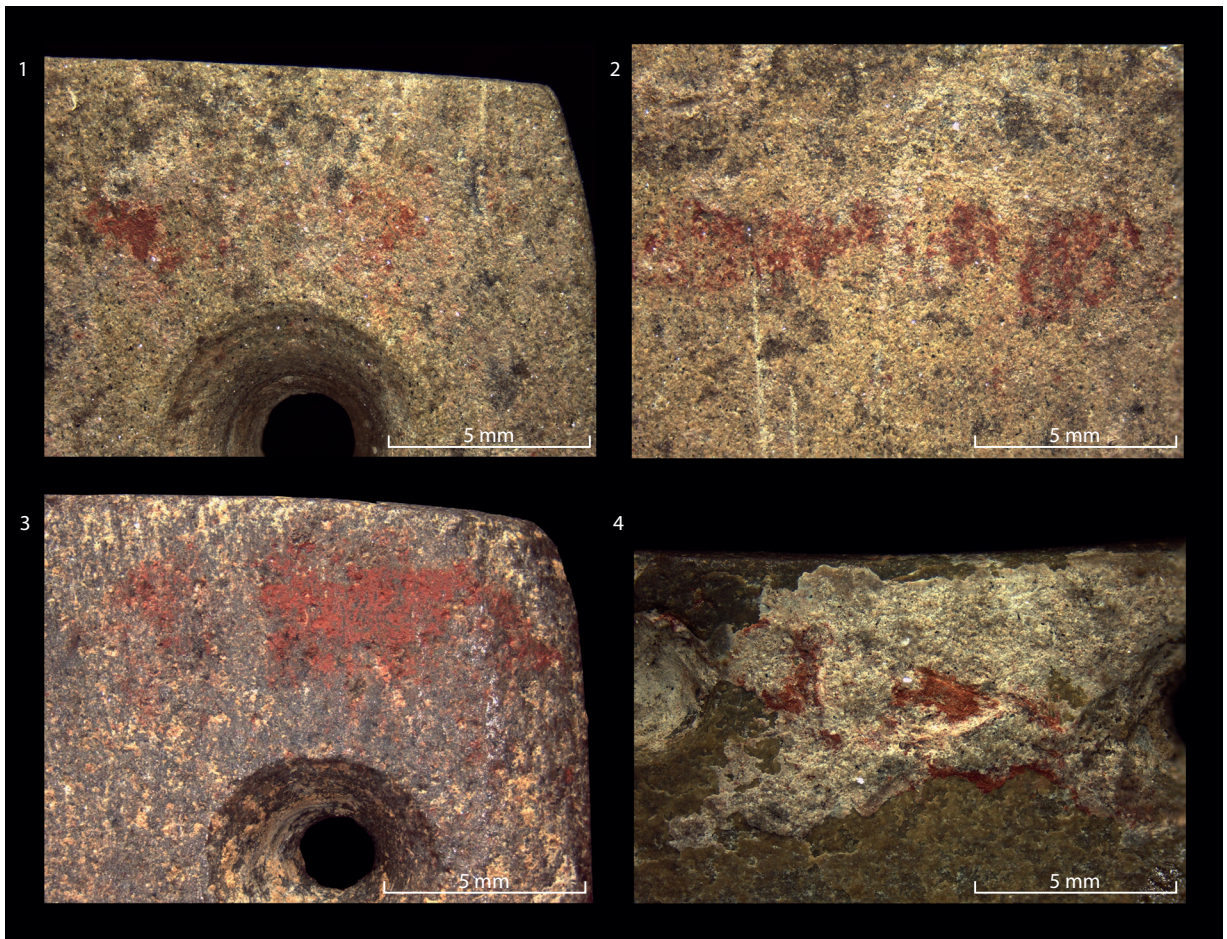


Fig. 22. Detailed views of ochre-stained bracers in Fig. 19: (1–2) lines of ochre, Szigetszentmiklós 'Felső Űrge-hegyi dűlő', grave 76–77, Hungary (H041; FM, no. 2009.11.76.14); (3) ochre deposit close to a perforation, Hulín 1 'U Isidorka', grave H95, Moravia (CZ086; ACO, no. 30/2004–1804-8); (4) ochre deposited on a concretion, Szigetszentmiklós 'Felső Űrge-hegyi dűlő', grave 433, Hungary (H060; FM, no. 2009.11.433.9) (photos: C. Nicolas).

### A means of protection for archers?

Experiments carried out by Pedro Muñoz Moro (2017) demonstrated that characteristic wear marks developed on wrist-guards that were used as such. These marks, which appeared after about 20 minutes of use, generally took the form of millimetric impacts or chips. However, it appears to be difficult to differentiate between this chipping of the surface linked to the use of a bow and flaking arising from natural or heat alteration. In fact, archers' bracers made from sedimentary stones are often affected, to a greater or lesser degree, by surface flaking which is often millimetric, but which can also involve the removal of large areas of the polished surface. As a consequence, the majority of bracers exhibit various degrees of surface flaking (Table 4). These areas of flaking are generally found on both faces, or only on the underside, and are thus clearly of natural or thermal origin. Only eight bracers display flaking on the outer surface alone. This flaking therefore appears to be too ubiquitous to be interpreted as use-wear.

However, the experiments carried out by Pedro Muñoz Moro were carried out over a short time span (20 minutes) and thus do not reflect long-term use of an archer's bracer. For this reason, one can envisage other traces that might occur over a long-time scale, for example, over-polished zones or striations arising from impacts and repeated rubbing by the bowstring.

Table 4. Inventory of surface flaking of bracers.

Surface flaking	Number of bracers
On both faces	66
On the outer surface	8
On the inner surface	7
None	27
Non-observable (concretions, labels, etc.)	45

The striations that are generally visible on the bracers correspond to the marks left by polishing or are short and haphazard. Indeed, none of the observed marks appear to suggest that the bracers were used as sharpeners; such a use would leave groups of short parallel striations (Muñoz Moro 2017). That said, only rare examples appear to have been used as archers' wrist-guards. A bracer from the cemetery at Souš (Bohemia) displays a scar prolonged by longitudinal striae which appear to have been created by the rubbing of the flake against the bracer (Fig. 23,1). This mark could correspond to an impact from the bowstring, although other explanations cannot be excluded due to the small size of the bracer (6.9 cm). The central areas of two other bracers bear wide, short, irregular, transversal striations. It is possible that these striations resulted from repeated impacts from the bowstring, but this needs to be demonstrated experimentally (Fig. 23,2).

These possible instances of use-wear, whether they are accidental or repeated, remain marginal and raise serious doubts about the recurrent use of bracers as proper archers' wrist-guards.

### Contexts of deposition

In this section, the deposition of bracers in graves and presumable ceremonial buildings has been examined. Thanks to the practice of individual burials in the Bell Beaker period, graves also provide information on people buried with bracers, and thus and for whom such items were intended.

### The position of bracers in graves

Within burials, the bracers are most often found on the forearms of the deceased (58.3%; Table 5). A bracer is generally found on the left forearm, indicating a high proportion of right-handed individuals (89.5%). However, this observation is significant only in the context of the practice of archery since, when shooting, it is the laterality of the master eye which is most important (Azémar 2003).

Movements linked to the decomposition of the body and other organic materials mean that the position of the bracer on the forearm is often ambiguous. An observation made by H. Fokkens et al. (2008) that bracers were most frequently worn on the outside of the forearm has since been criticised by S. van der Vaart (2009a, 33–35). Van der Vaart only retained three incontrovertible positions for the wearing of bracers on the forearm: on the exterior, on the interior and indeterminate. In this way, using the same corpus as Fokkens et al., she observed a high proportion of indeterminate wearing positions; conversely, only seven bracers were positioned on the inside of the forearm and three on the outside. However, some of these conclusions were drawn from second-hand plans which may, on



Fig. 23. Examples of traces of use-wear possibly linked to the use of bracers as archers' wrist-guards: (1) outer surface of a bracer bearing a flake scar prolonged by parallel, linear striations (resulting from the impact of a bow string?), Souš, Bohemia (CZ034; RMT, no. 2448); (2) bracer bearing short, transversal striations on its central portion, Tišice-Chrást I, Bohemia (CZ026; NM, no. 90063) (photos: C. Nicolas).

Table 5. Position of bracers in Bell Beaker burials in Central Europe (see Appendix).

	Number	On the outside of the forearm	On the inside of the forearm
<b>Inhumation</b>			
<i>Left forearm</i>	34	10	1
<i>Right forearm</i>	4	1	1
<i>Undetermined forearm</i>	11		
<i>In the area of the left elbow</i>	4		
<i>In the area of the right elbow</i>	1		
<i>In the area of the rib cage</i>	5		
<b>Cremation</b>			
<i>With the burnt bones</i>	8		
<i>Laid beside the burnt bones</i>	5		
<b>Offering</b>	12		
<b>Total</b>	84		

occasion, contradict first-hand field observations. In order to study the position of bracers, primary publications and, if possible, original excavation photographs have been reviewed. Thus, out of 49 inhumations, where the bracer is located in the area of the forearms, only 13 could be determined with certitude (see Appendix 2). It transpires that these bracers are more often worn on the outside of the forearm (11) than on the inside (2), thereby confirming the initial observations made by H. Fokkens et al. 2008 (Fig. 24,1.2.4). However, some bracers discovered on the forearms may be the result of a staging. In grave 626 at Szigetszentmiklós 'Felső Ürge-hegyi dűlő', a fire-shattered bracer broken into several pieces is found close to the left forearm and unlikely attached to it (Fig. 18,3). In grave 77/99 at Tišice, a bracer is placed on the left forearm but is back-to-front, i.e., with the underside facing outwards (Turek 2016; Fig. 24,4).

Although rarer, there exist alternative positions where the bracer is located at the level of the rib cage (5) or at the elbow (5; Fig. 24,3.5–6). While in certain cases this might result from the action of burrowing animals, it is also possible that in others it indicates that the bracers were worn in a different way, perhaps as part of an adornment, or that they were carried in a container, for example. In tomb 812 at Ivanovice na Hané VI, the bracer was found behind the elbow and was associated with a dagger (Fig. 24,5). In grave 67 at Jezeřany-Maršovice, the bracer, which was found by the rib cage, behind the right elbow, looks largely burnt and may originally have been held in a container or deposited as it was (Fig. 24,3). In the case of cremation burials (13), the bracers are generally mixed with the burnt bone or placed close to the ashes. Finally, a small number of bracers do not appear to have been worn by the deceased during the burial rite but were deposited separately along with other grave goods (Fig. 24,4).

### The wearers of bracers

The techno-functional analysis of the bracers has demonstrated that they could be deposited as worn or quite new objects. Above all, the traces of use highlight their value as display items. But who wore these object-signs?

Apart from a few early determinations, anthropological studies of skeletons developed from the 1980s onwards. As regards

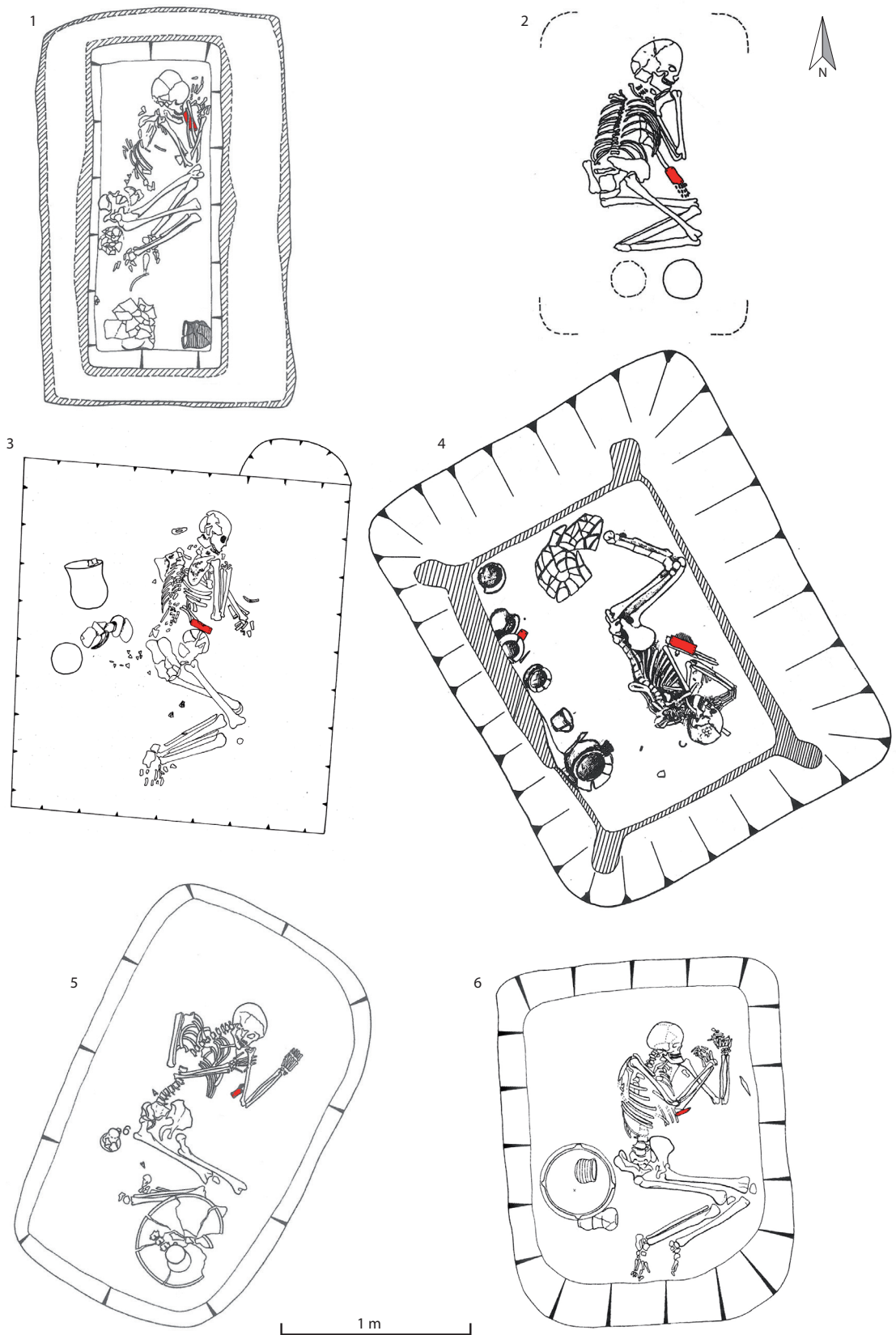


Fig. 24. Various positions of bracers (in red) in tombs: (1) the 'classic' position where the bracer is placed on the outside of the left forearm, Hoštice I, grave 939/02, Moravia (CZ124); (2) bracer positioned on the inside of the left forearm, Radovsice-Bílina III, grave 53/80-I, Bohemia (CZ053); (3) bracer (burnt?) discovered in the area of the rib cage and behind the right elbow, Jezeřany-Maršovice, grave 67, Moravia (CZ139); (4) bracer placed back-to-front on the left forearm and bracer deposited as a grave good with ceramic vessels, Tišice, grave 77/99, Bohemia (CZ025); (5) bracer situated behind the left elbow in contact with a copper dagger, Ivanovice na Hané, tomb 812/02 (CZ127); (6) bracer situated close to the right elbow, Hoštice I, grave 884/02, Moravia (CZ119) (1.5–6) after Matějčková/Dvořák 2012; 2.4 after Turek 2004; 3 after Langová/Rakovský 1981).



biological sex, two biases limit determination: immature individuals are not differentiable and the practice of cremation deteriorates bone, particularly the pelvis which is the most reliable indicator of sex (Ferembach et al. 1979). Occasionally, DNA analyses have allowed the determination of immature individuals (Vaňharová/Drozdoová 2008). Because of these limitations, only 85 out of 274 burials have been sexually determined. Nonetheless, gender (cultural sex) allows some of these gaps to be filled (Trémeaud 2015). In the Bell Beaker burials of Central Europe, the existence of specific positions of the remains – lying on the left side or the right side – expresses differences in gender (Turek/Černý 2001). This rule is also confirmed for tombs containing archery equipment. Apart from a few instances of gender transgression (where sex does not match the strict norms), the differentiation between masculine and feminine is confirmed by the determinations of biological sex.

Not surprisingly, burials accompanied by bracers are overwhelmingly of masculine sex and gender (Table 6–7). This observation applies to both Central Europe (Turek/Černý 2001; Fokkens et al. 2008) and Western Europe (Salanova 2007; Woodward/Hunter 2011; Nicolas 2016). However, not all adult men wore bracers. Within the largest cemeteries of Central Europe – Hoštice I (Matějčíková/Dvořák 2012), Szigetszentmiklós 'Felső Úrge-hegyi dűlő' (Patay 2013) and Bu-

Table 6. Inventory of bracer wearers according to sex in Central Europe. The numbers followed by '?' correspond to uncertain determinations.

Man	Woman	Indeterminate	Cenotaph	Total
63 + 14?	4 + 4?	173	16	274

Table 7. Inventory of bracer wearers according to gender in Central Europe.

Left-sided inhumation (Masculine)	Right-sided inhumation (Feminine)	Indeterminate	Cenotaph	Total
95	13	150	16	274

dakalász 'Luppa-csárda' (Czene 2008) – only 3 to 18% of the burials yield bracers, indicating that at least one man out of two was not equipped with one.

Inhumations lying on the right side, of feminine gender, exist. They represent 13 out of 95 individuals (12%), and include two individuals of feminine sex and one of masculine sex. Considering the sexual determinations, eight women (9.4%) were buried with a bracer. The access of women to archery equipment was therefore not prohibited, but remained marginal.

Archers' bracers were essentially the preserve of adult males (Table 8). There are, however, several cases where bracers are associated with young (< 15 years) or even very young (< 8 years) individuals: grave 1118 at Budakalász 'Luppa-csárda', Hungary (1–7 years old; Horváth 2017); grave 383 at Szigetszentmiklós 'Felső Úrge-hegyi dűlő', Hungary (6–8 years old; Patay 2013); Burial 1 at Landau III, Bavaria (0–6 years old; Husty 2004). In the case of grave 383 at

Table 8. Inventory of bracer wearers according to age in Central Europe

Immature (0–14 y)	Juvenile & Adult (15+ y)	Indeterminate	Cenotaph	Total
7	102	150	16	274

Szigetszentmiklós 'Felső Ürge-hegyi dűlő' and grave 841/02 at Hoštice IV in Moravia (Matějčková/Dvořák 2012), it is interesting to note that they yielded two of three miniature bracers made from perforated pebbles (Fig. 4,2–3). These, therefore, appear to be expedient products, destined specifically for young individuals. These young bracer wearers are, however, the exception and one might wonder if there was perhaps a hereditary element to their status or if they result as a rather symbolic expression of the afterlife.

Ultimately, bracers, which generally occur singly, seem to have been personal objects received or manufactured during adulthood as a mark of acquired or inherited social status and which accompanied an individual until his death. This hypothesis would explain why certain broken and reworked bracers were retained despite their condition.

### Foundation deposits

While not part of burials, two recent discoveries within buildings are worthy of mention. The first, Hostivice 'Palouky' (Bohemia), which was only partially excavated, is composed of two rows of postholes, some 4 m apart. At the centre of the structure was a large pit at the bottom in which four bracers arranged to form the four corners of a notional rectangle were recovered (Daněček et al. 2014; Fig. 25,1). The unusual nature of the feature and the absence of human remains or other finds excludes the possibility that this was a burial. Moreover, the building does not resemble a Bell Beaker house. Nevertheless, there is a strong likelihood that the deposit represents a foundation deposit. The second building, situated at Brodek u Proštejova in Moravia, is rectangular in plan, with its long axis orientated E-W, measuring 17 m in length by 4 m in width (Fojtík 2015; Grömer et al. 2017; Fig. 25,2). It is also composed of two rows of postholes. In the northern row, three bracers were deposited at the bottoms of three postholes. Thus, they probably constitute foundation deposits. This structure is bordered to the north by a smaller stake-built structure and to the west by four large rectangular pits, similar to vaults; the latter may be interpreted as cenotaphs and contain typical Bell Beaker grave goods. Among the finds were four bracers, two of which survive as burnt fragments; also present were arrowheads and a bow-shaped pendant. The foundation deposits and these symbolic offerings – some of which appear to have been sacrificed by burning – indicate that the building probably had a ritual function (e.g. a 'house' reserved for initiates, a temple, a sanctuary, etc.). In both cases, the bracers are complete (except the burnt ones) and show slight traces of wear, indicating that they had been worn before their deposition and removal from their life cycle.

### Conclusion: Bracers as personal adornment

The majority of Central European bracers are perfectly profiled to fit the forearm (ca. 10 cm long, 0.5 to 0.6 cm thick, with a curved cross-section and a shape that is often trapezoidal). While a large proportion of the bracers found in burials were positioned on the outside of the forearm, it could be argued that this was a symbolic or ornamental position (Turek 2015). It would have been possible to turn the bracer when required to be used as an archery wrist-guard. However, there is too little available evidence and traces of repeated use-wear to indicate such a use. Up until now, rare experiments have demonstrated that well-dimensioned bracers perfectly fulfilled



Fig. 25. Two cases of non-funerary deposition of bracers (indicated by red stars): (1) four bracers deposited at the base of a pit within a partially excavated post-built structure, Hostivice 'Palouky', Bohemia (excavated by D. Daněček, Středočeské muzeum Roztoky u Prahy); (2) three bracers deposited at the bases of postholes and four bracers deposited in cenotaphs, Brodek u Proštejova, Moravia (excavated by P. Fojtík, Kroměříž - Ústav archeologické památkové péče Brno) (Aerial views: 1 O. Tomek; 2 J. Šedivý, after Grömer et al. 2017; bracers photos: C. Nicolas).

the function of archery protection but the short duration of the experiments (a few hours at most) at best allowed ubiquitous traces of wear to be identified (Smith 2006; van der Vaart 2009a; Muñoz Moro 2017). Would prolonged use have resulted in the breaking off of the corners as is often observed in the archaeological record? A recent study on skeletal remains from Bohemia has pointed out that some people buried with stone bracers must have practiced archery

regularly in order to develop enthesal changes (on the joint between bones and ligaments; Ryan et al. 2018). In order to resolve the issue, it would be necessary to carry out experiments over longer durations to obtain a statistical sample for the recurrence of breakages and use-wears. Despite appearances, the protective function of these small stone plaques remains problematic.

Furthermore, the design of certain pieces seems to be somewhat incompatible with a protective function. As has already been pointed out by H. Fokkens and his colleagues (2008), very small examples (< 5 cm) would have offered insufficient protection for the forearm from the release of the bow string. Similarly, Type A bracers, featuring a flange at the extremities, can measure up to 1 cm thick and thus would have increased the chances that the bow string might actually strike the end of the bracer. At the end of their long use-life, certain bracers were so heavily re-worked that their small size and broken perforations meant that they no longer offered either a sufficient protective surface or the means to tie them securely in place. From their manufacture to the end of their life cycle, at least some bracers were not fit for a purpose as forearm protectors.

There is considerable evidence pointing to the fact that these plaques played a significant role as personal adornments and symbolic objects (Fokkens et al. 2008; van der Vaart 2009a; Woodward/Hunter 2011). They regularly show traces of a fairly long wearing time, indicated by wear on the edges and perforations. Most of depositional contexts correspond to single objects, physically tied to the deceased's body. The care paid to their manufacture and the application of ornaments, some of which were inlaid, appears superfluous if they were purely functional items. In particular, the traces of use and the depositional contexts indicate that the bracers had a value that largely exceeded their presumed practical function: the deposition of rough outs as grave goods, the manufacture of substitute bracers (perforated pebbles), multiple re-workings, the conservation of bracer relics, the presence of ochre, sacrifice by burning, and their deposition in building foundations all attest to the social significance and intangible value attached to these objects. The biography of 'archer bracers' appears to indicate that these small stone plaques were first and foremost items of personal adornment rather than protective equipment. In light of this, these perforated stone plaques should be considered, first and foremost, as bracer ornaments or bracelets as defined by H. Fokkens et al. (2008).

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## Appendices

### Appendix 1 – List of abbreviations

ACO : Archeologické centrum Olomouc  
ARUP : Archeologický ústav Praha  
FM : Ferenczy Museum Center in Cegléd  
MZMB : Moravské zemské muzeum Brno  
MGP : Muzeum a galerie v Prostějově  
MČB : Muzeum Český Brod  
MHMP : Muzeum hlavního města Prahy  
MKP : Muzeum Komenského v Přerově

MVCHK : Muzeum východních Čech v Hradci Králové  
MV : Muzeum Vyškovska  
NM : Národní muzeum  
OMC : Oblastní muzeum v Chomutově  
RMK : Regionální muzeum v Kolíně  
RMT : Regionální muzeum v Teplicích  
ÚAPPB : Ústav archeologické památkové péče, Brno  
VMS: Vlastivědné muzeum ve Slaném

### Appendix 2 – Inventory of graves yielding Bell Beaker bracer ornaments in Central Europe

#### Austria

##### A001 – Laa an der Thaya, Mistelbach, Lower Austria

*Burial:* grave?

*Bracer:* 1

*Chronology:* stage?

*Reference:* Franz et al. 1924; Heyd 2000; Metzinger-Schmidt 2004

##### A002 – Laa an der Thaya 8, Mistelbach, Lower Austria

*Burial:* pit, cremation

*Bracer:* 2

*Chronology:* stage 1

*Reference:* Hetzer 1949; Toriser 1976; Heyd 2000; Metzinger-Schmidt 2004; Bosch 2008

##### A003 – Gemeinlebarn 2071, Sankt Pölten, Lower Austria

*Burial:* pit, left-sided inhumation (sex: M; age: 20–)

*Bracer:* 1

*Position in grave:* outside the left forearm

*Chronology:* stage 1

*Reference:* Neugebauer/Neugebauer 1994; Neugebauer 1994; Heyd 2000; Metzinger-Schmidt 2004; Bosch 2008

##### A004 – Nußdorf ob der Traisen, Franzhausen 230, Sankt Pölten, Lower Austria

*Burial:* pit, left-sided inhumation (sex: M; age: 25–35)

*Bracer:* 1

*Position in grave:* at the left forearm

*Chronology:* stage 3

*Reference:* Neugebauer/Neugebauer 1997; Metzinger-Schmidt 2004

##### A005 – Henzing, Tulln, Lower Austria

*Burial:* pit?, inhumation

*Bracer:* 1

*Chronology:* stage?

*Reference:* Friesinger 1976; Neugebauer 1994; Heyd 2000; Bosch 2008

##### A006 – Oberbierbaum 1, Tulln, Lower Austria

*Burial:* pit, left-sided inhumation (sex: M; age: 20–)

*Bracer:* 1

*Position in grave:* at the left forearm

*Chronology:* stage 3

*Reference:* Neugebauer/Neugebauer 1992; 1994; Neugebauer 1994; Heyd 2000; Metzinger-Schmidt 2004; Bosch 2008; Růžičková 2009

##### A007 – Wien-Aspern 1, Vienne, Vienna

*Burial:* pit?, cremation

*Bracer:* 1

*Chronology:* stage 2

*Reference:* Hetzer 1949; Neugebauer 1994; Heyd 2000; Metzinger-Schmidt 2004

##### A008 – Wien-Aspern 2, Vienne, Vienna

*Burial:* pit?, cremation

*Bracer:* 1

*Chronology:* stage 2

*Reference:* Hetzer 1949; Neugebauer 1994; Heyd 2000; Metzinger-Schmidt 2004

#### Czech Republic

##### CZ001 – Březno 'Čachovice', grave 90B, Chomutov, Bohemia

*Burial:* pit, left-sided inhumation (sex: M; age: 40–50)

*Bracer:* 1

*Chronology:* stage 3

*Reference:* Neustupný/Smrž 1989; Turek 2004b

##### CZ002 – Bylany I, grave 2, Chrudim, Bohemia

*Burial:* pit, multiple burial (1 left-sided inhumation, 2 cremations) (sex: ?, ?, ?; age: Indéterminé, ?, ?)

*Bracer:* 2

*Chronology:* stage 2

*Reference:* Diviš-Čištecký 1901; Píč 1912; Stocky 1926; Schráníl 1928; Moucha 1989; Sangmeister 1964; 1974; Hájek 1968; Turek 2006a; Bosch 2008

##### CZ003 – Lochenice I, grave 4, Hradec Králové, Bohemia

*Burial:* pit, inhumation?

*Bracer:* 1

*Chronology:* stage 3

*Reference:* Hájek 1968; Buchvaldek 1990

##### CZ004 – Lochenice I, grave 5, Hradec Králové, Bohemia

*Burial:* pit, left-sided inhumation

*Bracer:* 1

*Position in grave:* deposit behind the pelvis with grave offerings

*Chronology:* stage 3

*Reference:* Hájek 1968; Buchvaldek 1990



**CZ005 – Lochenice I, grave 13, Hradec Králové, Bohemia***Burial:* pit, left-sided inhumation*Bracer:* 1*Position in grave:* outside the left forearm*Chronology:* stage 3*Reference:* Buchvaldek 1990**CZ006 – Lochenice I, grave 14, Hradec Králové, Bohemia***Burial:* pit, cremation (sex: F?; age: ?)*Bracer:* 1*Chronology:* stage 2*Reference:* Buchvaldek 1990; Bosch 2008; Růžičková 2008; 2009**CZ007 – Rosnice, grave I/59, Hradec Králové, Bohemia***Burial:* pit?, left-sided inhumation*Bracer:* 1*Position in grave:* at the left elbow*Chronology:* stage 2*Reference:* Vokolek 1965; Hájek 1968; Sangmeister 1974; Kuna/Matoušek 1978; Moucha 1978; Bosch 2008; Růžičková 2008; 2009; Merkl 2011**CZ008 – Rosnice, grave II/59, Hradec Králové, Bohemia***Burial:* pit, inhumation*Bracer:* 1*Chronology:* stage 3*Reference:* Vokolek 1965; Hájek 1968; Sangmeister 1974; Moucha 1978**CZ009 – Starý Bydžov, Hradec Králové, Bohemia***Burial:* pit?, inhumation*Bracer:* 1*Chronology:* stage 3*Reference:* Stocký 1926; Sangmeister 1964; 1974; Hájek 1968**CZ010 – Svobodné Dvory, Hradec Králové, Bohemia***Burial:* pit?, double inhumation (sex: ?, ?; age: ?, ?)*Bracer:* 2*Chronology:* stage 2*Reference:* Drozdová 2001; Domečka 1932; Schráníl 1928; Stocký 1926; Hájek 1957; 1968; Sangmeister 1974; Kuna/Matoušek 1978; Moucha 1978; 2003**CZ011 – Stehelčevy I, Kladno, Bohemia***Burial:* pit?, inhumation*Bracer:* 1*Chronology:* stage 2*Reference:* Collective 1873; Smolík 1881; Stocký 1926; Schráníl 1928; Hájek 1961; 1962; 1966; 1968; Sangmeister 1974; Kuna/Matoušek 1978; Moucha 1989; Bosch 2008**CZ012 – Stehelčevy III, grave 1, Kladno, Bohemia***Burial:* pit, left-sided inhumation (sex: M?; age: 20–)*Bracer:* 2*Position in grave:* one at the left forearm*Chronology:* stage 2*Reference:* Archives Slaný Muzeum; Knor 1966; Hájek 1968; Kuna/Matoušek 1978; Bosch 2008; Merkl 2011**CZ013 – Stehelčevy III, grave 2, Kladno, Bohemia***Burial:* ring-ditch/pit, left-sided inhumation (sex: M?; age: 20–)*Bracer:* 1*Position in grave:* at the left forearm*Chronology:* stage 2*Reference:* Archives Slaný Muzeum; Knor 1966; Hájek 1968; Kuna/Matoušek 1978; Bosch 2008; Merkl 2011**CZ014 – Zvoleněves II, grave 2, Kladno, Bohemia***Burial:* pit, left-sided inhumation*Bracer:* 1*Chronology:* stage 3*Reference:* Schmidt 1895; Stocký 1926; Hájek 1968; Sangmeister 1964; 1974**CZ015 – Kolín VI, grave 14, Kolín, Bohemia***Burial:* pit, left-sided inhumation (sex: M?; age: 20–)*Bracer:* 1*Chronology:* stage 2*Reference:* Stocký 1926; Dvořák 1931; Sangmeister 1964; 1974; Hájek 1968; Moucha 1978; Přichystal/Šebela 2013**CZ016 – Třebovle, Kolín, Bohemia***Burial:* pit?, left-sided inhumation*Bracer:* 1*Chronology:* stage 3*Reference:* Dvořák 1931; Hájek 1968; Sangmeister 1964; 1974**CZ017 – Mlékovice, grave 1, Kolín, Bohemia***Burial:* pit, inhumation*Bracer:* 1*Chronology:* stage 2*Reference:* Dvořák 1936; Schiermeisen 1936; Hájek 1946 ; 1968; Sangmeister 1964; Kuna/Matoušek 1978; Bosch 2008; Růžičková 2008 ; 2009**CZ018 – Libochovice II, grave 4, Litoměřice, Bohemia***Burial:* pit, left-sided inhumation*Bracer:* 1*Chronology:* stage?*Reference:* Hájek 1968; Sangmeister 1974; Přichystal 2000; Turek 2004b**CZ019 – Lovosice I, grave 6, Litoměřice, Bohemia***Burial:* pit, crouched inhumation*Bracer:* 1*Chronology:* stage 2*Reference:* Hájek 1942; 1957; 1968; Sangmeister 1974**CZ020 – Roudnice nad Labem, Litoměřice, Bohemia***Burial:* pit?, inhumation*Bracer:* 1*Chronology:* stage 3*Reference:* Stocký 1926; Hájek 1968; Sangmeister 1974**CZ021 – Štětí nad Labem, Litoměřice, Bohemia***Burial:* pit?, inhumation (sex: M?; age: 20–)*Bracer:* 1*Chronology:* stage 3*Reference:* Zápotocký 1962; Hájek 1968; Sangmeister 1974; Přichystal 2000; Turek 2004b**CZ022 – Sulejovice, grave 3, Litoměřice, Bohemia***Burial:* pit?*Bracer:* 1*Chronology:* stage 2*Reference:* Hájek 1962, 1968; Sangmeister 1974**CZ023 – Žabovřesky, grave II, Litoměřice, Bohemia***Burial:* grave?*Bracer:* 1*Chronology:* stage 2*Reference:* Zápotocký 1962; Hájek 1968

- CZ024 – Přívory, Mělník, Bohemia**  
*Burial:* pit?, left-sided inhumation  
*Bracer:* 1  
*Chronology:* stage 3  
*Reference:* Sklenař 1966; Hájek 1968; Sangmeister 1974
- CZ025 – Tišice, grave 77/99, Mělník, Bohemia**  
*Burial:* pit, right-sided inhumation  
*Bracer:* 2  
*Position in grave:* one outside the forearm, one deposited close to a ceramic  
*Chronology:* stage 2  
*Reference:* Turek/Foster 2000; Turek 2002; 2004a; 2004b; 2006a; Bosch 2008
- CZ026 – Tišice-Chrást I, grave 1, Mělník, Bohemia**  
*Burial:* pit, cremation  
*Bracer:* 1  
*Chronology:* stage?  
*Reference:* Sklenař 1966; Hájek 1968; Sangmeister 1974; Kuna/Matoušek 1978
- CZ027 – Tišice-Chrást II, grave 1, Mělník, Bohemia**  
*Burial:* pit?, inhumation  
*Bracer:* 1  
*Chronology:* stage 3  
*Reference:* Hájek 1968
- CZ028 – Tišice-Chrást II, grave 2, Mělník, Bohemia**  
*Burial:* pit?, inhumation  
*Bracer:* 1  
*Chronology:* stage 3  
*Reference:* Hájek 1968
- CZ029 – Neratovice, Mělník, Bohemia**  
*Burial:* pit?, inhumation  
*Bracer:* 1  
*Chronology:* stage 2  
*Reference:* Stocký 1926; Hájek 1968; Sangmeister 1974
- CZ030 – Neratovice I, grave 1, Mělník, Bohemia**  
*Burial:* pit?, inhumation  
*Bracer:* 1  
*Chronology:* stage 2  
*Reference:* Sklenař 1966; Hájek 1968; Kuna/Matoušek 1978; Moucha 1978; Merkl 2011
- CZ031 – Neratovice I, grave 17, Mělník, Bohemia**  
*Burial:* pit?, cremation  
*Bracer:* 1  
*Chronology:* stage?  
*Reference:* Sklenař 1966; Hájek 1968; Sangmeister 1974
- CZ032 – Neratovice I, grave 18, Mělník, Bohemia**  
*Burial:* pit?, inhumation  
*Bracer:* 1  
*Chronology:* stage 2  
*Reference:* Sklenař 1966; Hájek 1968; Sangmeister 1974
- CZ033 – Most VI, grave 1, Most, Bohemia**  
*Burial:* pit?, inhumation  
*Bracer:* 1  
*Chronology:* stage?  
*Reference:* Preidel 1934; Hájek 1968; Sangmeister 1974; Turek 2004b
- CZ034 – Souš, Most, Bohemia**  
*Burial:* graves?  
*Bracer:* 3  
*Chronology:* stage?  
*Reference:* Preidel 1934; Stocky 1926; Hájek 1968; Sangmeister 1974; Kuna/Matoušek 1978; Moucha 1978; Turek 2004b
- CZ035 – Vykán, Nymburk, Bohemia**  
*Burial:* pit, left-sided inhumation  
*Bracer:* 1  
*Chronology:* stage 3  
*Reference:* Hájek 1966, 1968; Sangmeister 1974; Moucha 1978; Bosch 2008; Růžičková 2008; 2009
- CZ036 – Prague 'Kobylis' VI, grave 1, Prague, Bohemia**  
*Burial:* pit, inhumation  
*Bracer:* 1  
*Chronology:* stage 3  
*Reference:* Kandyba 1935; Hájek 1968; Sangmeister 1974; Turek 1996; 2005
- CZ037 – Prague 'Kobylis' XV, grave 11, Prague, Bohemia**  
*Burial:* pit, left-sided inhumation (sex: M; age: 35–)  
*Bracer:* 1  
*Position in grave:* at the shoulders  
*Chronology:* stage?  
*Reference:* Turek 2005; 2006b; Turek/Kuchařík 2006
- CZ038 – Prague 'Kobylis' XV, grave 12, Prague, Bohemia**  
*Burial:* pit, left-sided inhumation (sex: M; age: 35–)  
*Bracer:* 1  
*Position in grave:* at the left elbow  
*Chronology:* stage?  
*Reference:* Turek 2005; 2006b; Turek/Kuchařík 2006
- CZ039 – Prague 'Letná', Prague, Bohemia**  
*Burial:* pit?, inhumation  
*Bracer:* 1  
*Chronology:* stage 1  
*Reference:* Hájek 1966; Sangmeister 1974; Turek 2008
- CZ040 – Prague 'Lysolaje' III, grave 6, Prague, Bohemia**  
*Burial:* pit, left-sided inhumation  
*Bracer:* 2  
*Chronology:* stage 2  
*Reference:* Hájek 1968; Sangmeister 1974; Kuna/Matoušek 1978; Merkl 2011
- CZ041 – Prague 'Lysolaje' III, grave 9, Prague, Bohemia**  
*Burial:* pit?, inhumation  
*Bracer:* 1  
*Chronology:* stage 2  
*Reference:* Hájek 1968; Sangmeister 1974; Kuna/Matoušek 1978; Moucha 1978; Turek 2008
- CZ042 – Prague 'Lysolaje' III, grave 10, Prague, Bohemia**  
*Burial:* pit, cremation  
*Bracer:* 1  
*Chronology:* stage?  
*Reference:* Hájek 1968; Sangmeister 1974

- CZ043 – Prague 'Lysolaje' III, grave 18, Prague, Bohemia**  
*Burial:* pit?, inhumation  
*Bracer:* 1  
*Chronology:* stage 2  
*Reference:* Hájek 1968; Sangmeister 1974; Bosch 2008; Růžičková 2008; 2009
- CZ044 – Prague 'Ruzyně', Prague, Bohemia**  
*Burial:* pit?, inhumation  
*Bracer:* 1  
*Chronology:* stage?  
*Reference:* Hájek 1968; Sangmeister 1974; Kuna/Matoušek 1978; Merkl 2011
- CZ045 – Prague 'Velká Chuchle', grave 81, Prague, Bohemia**  
*Burial:* pit, stone structure, left-sided inhumation (sex: M; age: 20–35)  
*Bracer:* 2  
*Position in grave:* one at the rib cage level, one deposited with grave offerings  
*Chronology:* stage 3  
*Reference:* Zemanová/Turek 2009
- CZ046 – Prague 'Velká Chuchle', grave 83, Prague, Bohemia**  
*Burial:* pit, left-sided inhumation? (sex: ?; age: 20–)  
*Bracer:* 1  
*Chronology:* stage 3  
*Reference:* Zemanová/Turek 2009
- CZ047 – Prague 'Vršovice' IV, grave 3, Prague, Bohemia**  
*Burial:* pit, right-sided inhumation  
*Bracer:* 1  
*Chronology:* stage?  
*Reference:* Hájek 1968; Sangmeister 1974; Turek 2008
- CZ048 – Prague 'Vršovice' IV, grave 4, Prague, Bohemia**  
*Burial:* pit, left-sided inhumation  
*Bracer:* 1  
*Position in grave:* at the left forearm  
*Chronology:* stage 3  
*Reference:* Hájek 1946; 1968; Sangmeister 1964; 1974; Bosch 2008; Turek 2008; Růžičková 2008; 2009
- CZ049 – Řež, grave 6, Prague-východ, Bohemia**  
*Burial:* pit?, inhumation  
*Bracer:* 1  
*Chronology:* stage 2  
*Reference:* Stocký 1916; 1926; Schráníl 1928; Sangmeister 1964; Hájek 1968
- CZ050 – Mochov, grave 30, Prague-západ, Bohemia**  
*Burial:* pit, left-sided inhumation (sex: M?; age: 20–)  
*Bracer:* 1  
*Position in grave:* at the left forearm  
*Chronology:* stage 3  
*Reference:* Moucha 1966; 1972; 1978; Hájek 1968; Kuna/Matoušek 1978
- CZ051 – Bílina VI, grave 3, Teplice, Bohemia**  
*Burial:* pit?, inhumation  
*Bracer:* 1  
*Chronology:* stage 3  
*Reference:* Hájek 1968; Turek 2004b

- CZ052 – Radovesice-Bílina II, grave 116/78, Teplice, Bohemia**  
*Burial:* pit, left-sided inhumation  
*Bracer:* 1  
*Chronology:* stage?  
*Reference:* Muška 1981; Turek 2004a; 2004b; 2006a; Přichystal 2000; Turek/Černý 2001; Bosch 2008
- CZ053 – Radovesice-Bílina III, grave 53/80-I, Teplice, Bohemia**  
*Burial:* pit, left-sided inhumation  
*Bracer:* 1  
*Position in grave:* inside the left forearm  
*Chronology:* stage 2  
*Reference:* Muška 1981; Turek 2004b; 2006a; Turek/Černý 2001
- CZ054 – Radovesice-Bílina III, grave 53/80-II, Teplice, Bohemia**  
*Burial:* pit, cremation (sex: ?; age: 0–20)  
*Bracer:* 1  
*Chronology:* stage 3, 3860 ± 40 BP (KI-4449), sample?, 2464–2206 cal BC (95.4 %)  
*Reference:* Muška 1981; Turek 2004b; 2006a; Turek/Černý 2001; Bosch 2008; Růžičková 2008; 2009; Peška 2012
- CZ055 – Dolní Věstonice III, grave 330/77, Břeclav, Moravia**  
*Burial:* pit, crouched inhumation  
*Bracer:* 1  
*Position in grave:* at the right forearm  
*Chronology:* stage 2  
*Reference:* Dvořák et al. 1996; Metzinger-Schmidt 2004; Bosch 2008; Olivík 2009
- CZ056 – Klobouky III, Břeclav, Moravia**  
*Burial:* pit?, inhumation  
*Bracer:* 1  
*Chronology:* stage?  
*Reference:* Kovář 1914; Sangmeister 1974; Dvořák et al. 1996; Metzinger-Schmidt 2004; Bosch 2008; Olivík 2009
- CZ057 – Klobouky IV, grave 2/66, Břeclav, Moravia**  
*Burial:* grave?  
*Bracer:* 1  
*Chronology:* stage?  
*Reference:* Ondráček 1967; Dvořák et al. 1996; Metzinger-Schmidt 2004; Bosch 2008; Olivík 2009
- CZ058 – Pavlov I, grave 519/83, Břeclav, Moravia**  
*Burial:* pit, left-sided inhumation (sex: M; age: 15–20)  
*Bracer:* 1  
*Position in grave:* at the forearms  
*Chronology:* stage 3  
*Reference:* Geisler et al. 1985; Čižmář et al. 1984; Dvořák et al. 1996; Metzinger-Schmidt 2004; Bosch 2008; Kopacz et al. 2009; Olivík 2009
- CZ059 – Brno 'Holásky' II, grave 13/38, Brno-město, Moravia**  
*Burial:* pit, inhumation?  
*Bracer:* 2  
*Position in grave:* both deposited with grave offerings  
*Chronology:* stage 3  
*Reference:* Chleborád 1950; Dvořák 1991; 1992; Přichystal 2000; Metzinger-Schmidt 2004; Bosch 2008; Kopacz et al. 2009; Olivík 2009

**CZ060 – Brno 'Holásky' II, grave 35/38, Brno-město, Moravia***Burial:* pit, inhumation*Bracer:* 1*Position in grave:* deposited with grave offerings*Chronology:* stage 3*Reference:* Chleborád 1950; Dvořák 1991; 1992; Přichystal 2000; Metzinger-Schmidt 2004; Kopacz et al. 2009; Olivík 2009**CZ061 – Brno 'Líšeň' II, grave 8, Brno-město, Moravia***Burial:* pit, left-sided inhumation? (sex: M?; age: 20–24)*Bracer:* 1*Position in grave:* close to the skeleton*Chronology:* stage?*Reference:* Drozdová 2001; Matějčková 2001; Olivík 2009**CZ062 – Brno 'Židenice' 4/32, Brno-město, Moravia***Burial:* pit?, inhumation*Bracer:* 1*Chronology:* stage 3*Reference:* Dvořák 1992; Metzinger-Schmidt 2004; Olivík 2009**CZ063 – Blažovice II, grave 4/13, Brno-venkov, Moravia***Burial:* pit?, inhumation*Bracer:* 1*Chronology:* stage 3*Reference:* Dvořák 1992; Metzinger-Schmidt 2004; Olivík 2009**CZ064 – Blažovice II, grave 16/33, Brno-venkov, Moravia***Burial:* pit?, inhumation*Bracer:* 1*Chronology:* stage 3*Reference:* Dvořák 1992; Metzinger-Schmidt 2004; Olivík 2009**CZ065 – Blažovice II, grave 19/33, Brno-venkov, Moravia***Burial:* pit?, inhumation*Bracer:* 1*Chronology:* stage?*Reference:* Dvořák 1992; Kopacz et al. 2009; Metzinger-Schmidt 2004; Olivík 2009**CZ066 – Ivančice, grave 1/52, Brno-venkov, Moravia***Burial:* pit?, right-sided inhumation*Bracer:* 1*Position in grave:* at the left forearm*Chronology:* stage 3*Reference:* Dvořák 1992; Přichystal 2000; Metzinger-Schmidt 2004; Olivík 2009**CZ067 – Ledce II, grave 1/52, Brno-venkov, Moravia***Burial:* pit, wooden structure, left-sided inhumation*Bracer:* 1*Position in grave:* at the forearms*Chronology:* stage 1*Reference:* Benešová 1953; Dvořák 1992; 1993; Metzinger-Schmidt 2004; Bosch 2008; Růžičková 2008; 2009; Kopacz et al. 2009; Olivík 2009**CZ068 – Modřice, grave 1/1990, Brno-venkov, Moravia***Burial:* pit, left-sided inhumation*Bracer:* 1*Position in grave:* at the left forearm?*Chronology:* stage?*Reference:* Geisler 1990b; Metzinger-Schmidt 2004; Kopacz et al. 2009; Olivík 2009**CZ069 – Šlapanice II, grave 12/34, Brno-venkov, Moravia***Burial:* pit, right-sided inhumation*Bracer:* 1*Position in grave:* at the left forearm*Chronology:* stage 2*Reference:* Skutil 1941; Hájek 1957; 1966; Moucha 1981; Dvořák/Hájek 1990; Dvořák 1990; Metzinger-Schmidt 2004; Bosch 2008; Olivík 2009**CZ070 – Šlapanice II, graves 5/35 & 6/35, Brno-venkov, Moravia***Burial:* pit, double burial (1 inhumation, 1 cremation) (sex: F?, ?; age: 18–, ?)*Bracer:* 1*Chronology:* stage 2*Reference:* Hájek 1962; Dvořák/Hájek 1990; Dvořák 1990; Sangmeister 1974; Metzinger-Schmidt 2004; Bosch 2008; Olivík 2009**CZ071 – Smolín I, grave 13/51, Brno-venkov, Moravia***Burial:* ring-ditch/pit, wooden structure, inhumation?*Bracer:* 1*Chronology:* stage 2*Reference:* Novotný 1958; Hájek 1966; Sangmeister 1974; Kuna/Matoušek 1978; Dvořák 1993; Dvořák et al. 1996; Metzinger-Schmidt 2004; Bosch 2008; Kopacz et al. 2009; Olivík 2009**CZ072 – Josefov I, grave 3/37, Hodonín, Moravia***Burial:* pit?, inhumation*Bracer:* 1*Chronology:* stage?*Reference:* Olivík 2009**CZ073 – Josefov III, grave 1/65, Hodonín, Moravia***Burial:* pit?, inhumation*Bracer:* 1*Chronology:* stage?*Reference:* Olivík 2009**CZ074 – Mikulčice, site I, grave 1/1924, Hodonín, Moravia***Burial:* pit?*Bracer:* 1*Chronology:* stage?*Reference:* Kuna/Matoušek 1978; Kopacz et al. 2009; Olivík 2009; Matějčková/Dvořák 2012**CZ075 – Mutěnice II, grave 2/30, Hodonín, Moravia***Burial:* pit?, inhumation*Bracer:* 1*Chronology:* stage 2*Reference:* Tůmová 2008; Olivík 2009**CZ076 – Svatobořice, grave 18, Hodonín, Moravia***Burial:* pit?*Bracer:* 1*Chronology:* stage 2*Reference:* Červinka 1933; Metzinger-Schmidt 2004; Olivík 2009

**CZ077 – Svatoborice-Mistřin 1/1902, Hodonín, Moravia***Burial:* pit?, inhumation*Bracer:* 1*Chronology:* stage 2*Reference:* Červinka 1910; 1911; 1933; Sangmeister 1964; 1974; Kuna/Matoušek 1978; Metzinger-Schmidt 2004; Olivík 2009**CZ078 – Svatoborice-Mistřin 22/42, Hodonín, Moravia***Burial:* pit?, inhumation*Bracer:* 1*Chronology:* stage 2*Reference:* Olivík 2009**CZ079 – Veselí nad Moravou, Hodonín, Moravia***Burial:* pit, left-sided inhumation*Bracer:* 1*Position in grave:* between the forearms*Chronology:* stage 3*Reference:* Staňa 1959; Sangmeister 1974; Metzinger-Schmidt 2004; Olivík 2009**CZ080 – Zarazice, Hodonín, Moravia***Burial:* grave?*Bracer:* 1*Chronology:* stage?*Reference:* Štaňa 1959; Metzinger-Schmidt 2004; Olivík 2009; Matějčíková/Dvořák 2012**CZ081 – Holešov, grave I, Kroměříž, Moravia***Burial:* pit, cremation (sex: ?; age: 8–14)*Bracer:* 1*Chronology:* stage?*Reference:* Struhala 1951; Ondráček/Šebela 1985; Stloukal 1985; Šmejda 2001; Metzinger-Schmidt 2004**CZ082 – Holešov, grave II, Kroměříž, Moravia***Burial:* pit, left-sided inhumation (sex: M; age: 20–)*Bracer:* 1*Position in grave:* at the left forearm?*Chronology:* stage 2*Reference:* Struhala 1951; Ondráček/Šebela 1985; Stloukal 1985; Šmejda 2001; Metzinger-Schmidt 2004; Kopacz et al. 2009; Olivík 2009**CZ083 – Holešov, grave X, Kroměříž, Moravia***Burial:* pit, left-sided inhumation (sex: ?; age: 20–)*Bracer:* 1*Position in grave:* at the left forearm?*Chronology:* stage 2*Reference:* Struhala 1951; Ondráček/Šebela 1985; Stloukal 1985; Moucha 1989; Přichystal 2000; Šmejda 2001; Turek 2004a; Metzinger-Schmidt 2004; Bosch 2008; Kopacz et al. 2009; Olivík 2009**CZ084 – Hulín 1 'U Isidorka', H66, Kroměříž, Moravia***Burial:* pit, left-sided inhumation*Bracer:* 1*Chronology:* stage?*Reference:* Peška 2013**CZ085 – Hulín 1 'U Isidorka', H85, Kroměříž, Moravia***Burial:* pit, left-sided inhumation*Bracer:* 1*Position in grave:* moved, close to the rib cage*Chronology:* stage?*Reference:* Peška 2013**CZ086 – Hulín 1 'U Isidorka', H95, Kroměříž, Moravia***Burial:* pit, inhumation?*Bracer:* 2*Chronology:* stage?*Reference:* Růžičková/Králík 2007; Růžičková 2008; 2009; Peška 2013**CZ087 – Hulín 2 'Pravčice', H45, Kroměříž, Moravia***Burial:* pit, left-sided inhumation (sex: ?; age: 20–)*Bracer:* 1*Position in grave:* outside the left forearm*Chronology:* stage 2*Reference:* Peška/Kalábek 2008; Peška 2013**CZ088 – Hulín 2 'Pravčice', H46, Kroměříž, Moravia***Burial:* pit, inhumation?*Bracer:* 1*Chronology:* stage 3*Reference:* Peška/Kalábek 2008; Peška 2013**CZ089 – Hulín 2 'Pravčice', H54, Kroměříž, Moravia***Burial:* pit, wooden structure, inhumation?*Bracer:* 1*Chronology:* stage 2*Reference:* Peška/Kalábek 2008; Peška 2013**CZ090 – Hulín 2 'Pravčice', H58, Kroměříž, Moravia***Burial:* pit, inhumation?*Bracer:* 1*Chronology:* stage 2*Reference:* Peška/Kalábek 2008; Peška 2013**CZ091 – Hulín 2 'Pravčice', H59, Kroměříž, Moravia***Burial:* pit, inhumation?*Bracer:* 1*Chronology:* stage?*Reference:* Peška/Kalábek 2008; Peška 2013**CZ092 – Hulín 2 'Pravčice', H60, Kroměříž, Moravia***Burial:* pit, wooden structure, inhumation?*Bracer:* 1*Chronology:* stage 2*Reference:* Peška/Kalábek 2008; Zapletalová 2009; Peška 2013**CZ093 – Hulín 2 'Pravčice', H63, Kroměříž, Moravia***Burial:* pit, inhumation (sex: ?; age: 20–)*Bracer:* 1*Chronology:* stage 2*Reference:* Peška/Kalábek 2008; Zapletalová 2009; Peška 2013**CZ094 – Hulín 2 'Pravčice', H74, Kroměříž, Moravia***Burial:* pit, inhumation*Bracer:* 4*Chronology:* stage 2*Reference:* Peška/Kalábek 2008; Zapletalová 2009; Peška 2013**CZ095 – Kostelec u Holešova II, grave 13, Kroměříž, Moravia***Burial:* pit?, left-sided inhumation*Bracer:* 1*Chronology:* stage 2*Reference:* Červinka 1902; 1909; 1910; 1911; Tůmová 2008; Olivík 2009

**CZ096 – Kostelec u Holešova III, barrow 2, Kroměříž, Moravia***Burial:* barrow, grave?*Bracer:* 1*Chronology:* stage 2*Reference:* Červinka 1902; 1909; 1910; 1911; Metzinger-Schmidt 2004; Olivík 2009**CZ097 – Prusinovice I, grave 1, Kroměříž, Moravia***Burial:* barrow, inhumation?*Bracer:* 2*Position in grave:* one deposited with grave offerings*Chronology:* stage 2*Reference:* Červinka 1909; 1910; 1911; Sangmeister 1964; 1974; Metzinger-Schmidt 2004; Olivík 2009**CZ098 – Záhlinice, grave 48/89, Kroměříž, Moravia***Burial:* pit, right-sided inhumation*Bracer:* 1*Chronology:* stage 1, 3935 ± 40 BP (VERA-5230), human bone, 2566–2297 cal BC (95.4 %)*Reference:* Dvořák et al. 1992; Metzinger-Schmidt 2004; Bosch 2008; Olivík 2009; Peška 2012**CZ099 – Nemilany I, grave 1/40, Olomouc, Moravia***Burial:* , right-sided inhumation*Bracer:* 1*Chronology:* stage?*Reference:* Tůmová 2008; Olivík 2009**CZ100 – Opatovice, grave 1, Přerov, Moravia***Burial:* pit, left-sided inhumation (sex: ?; age: 20–35)*Bracer:* 1*Position in grave:* at the left forearm*Chronology:* stage 2*Reference:* Peška/Vránová 2011**CZ101 – Předmostí, grave (?) 1, Přerov, Moravia***Burial:* pit, grave?*Bracer:* 2*Chronology:* stage 1*Reference:* Medunová-Benešová 1962; Hájek 1966; Sangmeister 1974; Kuna/Matoušek 1978; Moucha 1989; Dvořák 1989; 1993; Metzinger-Schmidt 2004; Bosch 2008; Kopacz et al. 2009; Olivík 2009; Merkl 2011; Malaníková 2011; Matějčíková/Dvořák 2012**CZ102 – Předmostí, grave (?) 2, Přerov, Moravia***Burial:* pit, Pas de squelette (grave ?)*Bracer:* 2*Chronology:* stage 1*Reference:* Medunová-Benešová 1962; Hájek 1966; Sangmeister 1974; Kuna/Matoušek 1978; Moucha 1989; Metzinger-Schmidt 2004; Bosch 2008; Olivík 2009; Merkl 2011; Malaníková 2011; Matějčíková/Dvořák 2012**CZ103 – Němčice nad Hanou, grave 18, Přerov, Moravia***Burial:* pit, left-sided inhumation*Bracer:* 2*Chronology:* stage?*Reference:* Červinka 1910; Olivík 2009; Malaníková 2011; Matějčíková/Dvořák 2012**CZ104 – Němčice nad Hanou, grave 33, Přerov, Moravia***Burial:* pit, left-sided inhumation*Bracer:* 2*Chronology:* stage 3*Reference:* Sangmeister 1974; Metzinger-Schmidt 2004; Kopacz et al. 2009; Olivík 2009; Malaníková 2011; Matějčíková/Dvořák 2012**CZ105 – Turovice 'Kopice', Přerov, Moravia***Burial:* barrow, cremation?*Bracer:* 1*Chronology:* stage?*Reference:* Červinka 1902; 1910; 1911; Zápotocký 1962; Sangmeister 1964; 1974; Kuna/Matoušek 1978; Metzinger-Schmidt 2004; Bosch 2008; Kopacz et al. 2009; Olivík 2009; Merkl 2011**CZ106 – Brodek u Proštejova, H1, Prostějov, Moravia***Burial:* pit, cenotaph?*Bracer:* 3*Chronology:* stage 2*Reference:* Grömer et al. 2017**CZ107 – Brodek u Proštejova, H2, Prostějov, Moravia***Burial:* pit, cenotaph?*Bracer:* 1*Chronology:* stage 2*Reference:* Grömer et al. 2017**CZ108 – Hrubčice, Prostějov, Moravia***Burial:* pit?, left-sided inhumation*Bracer:* 1*Position in grave:* deposited with grave offerings*Chronology:* stage?*Reference:* Červinka 1902; 1910; 1911; Sangmeister 1964; 1974; Metzinger-Schmidt 2004; Tůmová 2008; Olivík 2009; Matějčíková/Dvořák 2012**CZ109 – Ondratice I, grave 1/1900, Prostějov, Moravia***Burial:* pit?, inhumation?*Bracer:* 1*Chronology:* stage 2*Reference:* Tůmová 2008; Olivík 2009**CZ110 – Prostějov IV, grave 1/45, Prostějov, Moravia***Burial:* pit?, inhumation?*Bracer:* 1*Chronology:* stage 2*Reference:* Tůmová 2008; Olivík 2009; Matějčíková/Dvořák 2012**CZ111 – Zešov, Prostějov, Moravia***Burial:* pit?, inhumation*Bracer:* 1*Chronology:* stage?*Reference:* Gottwald 1931; Sangmeister 1974; Metzinger-Schmidt 2004; Tůmová 2008; Olivík 2009**CZ112 – Lhánice, grave 7/50, Třebíč, Moravia***Burial:* pit, cremation*Bracer:* 1*Chronology:* stage 2*Reference:* Hájek 1951; 1957; 1966; Sangmeister 1964; 1974; Metzinger-Schmidt 2004; Moucha 2005; Olivík 2009; Matějčíková/Dvořák 2012

**CZ113 – Lhánice, grave 8/50, Třebíč, Moravia***Burial:* pit, left-sided inhumation*Bracer:* 1*Position in grave:* at the neck/shoulder level*Chronology:* stage 3*Reference:* Hájek 1951; 1957; 1966; Sangmeister 1974; Kuna/Matoušek 1978; Metzinger-Schmidt 2004; Moucha 2005; Olivík 2009; Merkl 2011**CZ114 – Dolní Sukolom, grave 8/45, Uničov, Moravia***Burial:* pit?, inhumation*Bracer:* 1*Chronology:* stage?*Reference:* Hájek 1951; Tůmová 2008; Kopacz et al. 2009; Olivík 2009**CZ115 – Brankovice, grave 2, Vyškov, Moravia***Burial:* pit, cremation (sex: ?; age: 40)*Bracer:* 1*Chronology:* stage 2*Reference:* Kalousek 1956; Sangmeister 1964; 1974; Metzinger-Schmidt 2004; Olivík 2009**CZ116 – Hodějice, Vyškov, Moravia***Burial:* pit?, inhumation?*Bracer:* 1*Chronology:* stage 1*Reference:* Červinka 1902; 1910; Sangmeister 1974; Metzinger-Schmidt 2004; Ondráček et al. 2005; Tůmová 2008; Olivík 2009**CZ117 – Hoštice I, grave 843/02, Vyškov, Moravia***Burial:* pit, left-sided inhumation (sex: M; age: 45–55)*Bracer:* 1*Position in grave:* at the left forearm*Chronology:* stage 3*Reference:* Olivík 2009; Matějčková/Dvořák 2012**CZ118 – Hoštice I, grave 862/02, Vyškov, Moravia***Burial:* pit, left-sided inhumation (sex: M; age: 49–58)*Bracer:* 1*Position in grave:* at the left forearm*Chronology:* stage 2*Reference:* Olivík 2009; Matějčková/Dvořák 2012**CZ119 – Hoštice I, grave 884/02, Vyškov, Moravia***Burial:* pit, left-sided inhumation (sex: M; age: 37–46)*Bracer:* 1*Position in grave:* at the right elbow*Chronology:* stage 3*Reference:* Olivík 2009; Matějčková/Dvořák 2012**CZ120 – Hoštice I, grave 885/02, Vyškov, Moravia***Burial:* pit, left-sided inhumation (sex: M; age: 45–55)*Bracer:* 1*Position in grave:* at the right forearm*Chronology:* stage?*Reference:* Olivík 2009; Matějčková/Dvořák 2012**CZ121 – Hoštice I, grave 911/02, Vyškov, Moravia***Burial:* pit, cenotaph?*Bracer:* 1*Chronology:* stage?*Reference:* Olivík 2009; Matějčková/Dvořák 2012**CZ122 – Hoštice I, grave 915/02, Vyškov, Moravia***Burial:* pit, left-sided inhumation (sex: M; age: 40–50)*Bracer:* 1*Position in grave:* outside the left forearm*Chronology:* stage 2*Reference:* Olivík 2009; Matějčková/Dvořák 2012**CZ123 – Hoštice I, grave 917/02, Vyškov, Moravia***Burial:* pit, left-sided inhumation (sex: M; age: 30–35)*Bracer:* 1*Position in grave:* deposited with grave offerings*Chronology:* stage 2*Reference:* Olivík 2009; Matějčková/Dvořák 2012**CZ124 – Hoštice I, grave 939/02, Vyškov, Moravia***Burial:* pit, wooden structure, left-sided inhumation (sex: M; age: 70–79)*Bracer:* 1*Position in grave:* at the left forearm*Chronology:* stage 2*Reference:* Olivík 2009; Matějčková/Dvořák 2012**CZ125 – Hoštice I, grave 949/02, Vyškov, Moravia***Burial:* pit, left-sided inhumation (sex: M; age: 55–64)*Bracer:* 1*Position in grave:* outside the left forearm*Chronology:* stage 3*Reference:* Olivík 2009; Matějčková/Dvořák 2012**CZ126 – Hoštice IV, grave 841/02, Vyškov, Moravia***Burial:* pit, left-sided inhumation (sex: ?; age: 0–20)*Bracer:* 1*Position in grave:* at the left forearm?*Chronology:* stage 3*Reference:* Matějčková/Dvořák 2012**CZ127 – Ivanovice na Hané, grave 812/02, Vyškov, Moravia***Burial:* pit, left-sided inhumation (sex: M; age: 25–35)*Bracer:* 1*Position in grave:* at the left elbow*Chronology:* stage 3*Reference:* Tkáč 2008; Kopacz et al. 2009; Olivík 2009; Matějčková/Dvořák 2012**CZ128 – Letonice, grave 1, Vyškov, Moravia***Burial:* pit, crouched inhumation*Bracer:* 1*Position in grave:* at the left forearm*Chronology:* stage 2*Reference:* Kalousek 1956; Hájek 1962; Sangmeister 1964; 1974; Kuna/Matoušek 1978; Dvořák 1993; Metzinger-Schmidt 2004; Olivík 2009; Merkl 2011**CZ129 – Luleč, Vyškov, Moravia***Burial:* pit, left-sided inhumation (sex: M; age: 35–45)*Bracer:* 1*Chronology:* stage 3*Reference:* Baarová 2003; Kopacz et al. 2009; Olivík 2009**CZ130 – Marefy, grave 6, Vyškov, Moravia***Burial:* pit, left-sided inhumation (sex: M; age: 20–)*Bracer:* 1*Position in grave:* at the left forearm*Chronology:* stage 2*Reference:* Kalousek 1956; Sangmeister 1964; 1974; Šebela/Škrdla 2003; Metzinger-Schmidt 2004; Kopacz et al. 2009; Olivík 2009

**CZ131 – Nesovice, Vyškov, Moravia***Burial:* pit, right-sided inhumation*Bracer:* 1*Chronology:* stage 3*Reference:* Kalousek 1956; Hájek 1957; Sangmeister 1964; 1974; Metzinger-Schmidt 2004; Olivík 2009; Matějčková/Dvořák 2012**CZ132 – Pustiměř III, Vyškov, Moravia***Burial:* pit?, left-sided inhumation*Bracer:* 1*Chronology:* stage 3*Reference:* Tůmová 2008; Olivík 2009**CZ133 – Rousínov-Rousínovec II 18/1985, Vyškov, Moravia***Burial:* pit, stone structure, right-sided/left-sided double inhumation (sex: M, M; age: 20–30, 30–40)*Bracer:* 1*Position in grave:* between the rib cage and the arms*Chronology:* stage 2*Reference:* Čižmař/Geisler 1985; Geisler 1990a; Metzinger-Schmidt 2004; Růžičková 2008, 2009; Kopacz et al. 2009; Olivík 2009; Matějčková/Dvořák 2012**CZ134 – Slavkov u Brna III, grave 8/04, Vyškov, Moravia***Burial:* pit, left-sided inhumation*Bracer:* 1*Chronology:* stage 3*Reference:* Červinka 1910; 1911; Zápotocký 1962; Kuna/Matoušek 1978; Dvořák 1993; Tůmová 2008; Kopacz et al. 2009; Olivík 2009**CZ135 – Běhařovice I, grave 1/1899, Znojmo, Moravia***Burial:* pit, inhumation*Bracer:* 1*Chronology:* stage 3*Reference:* Tůmová 2008; Olivík 2009**CZ136 – Bohutice II, grave 1/50, Znojmo, Moravia***Burial:* pit?, cremation*Bracer:* 2*Chronology:* stage 2*Reference:* Moucha 1981; Metzinger-Schmidt 2004; Olivík 2009; Matějčková/Dvořák 2012**CZ137 – Dolní Dubňany, grave 5/30, Znojmo, Moravia***Burial:* pit?, right-sided inhumation*Bracer:* 1*Chronology:* stage?*Reference:* Kuna/Matoušek 1978; Metzinger-Schmidt 2004; Tůmová 2008; Olivík 2009**CZ138 – Hodonice-Tasovice, Znojmo, Moravia***Burial:* pit?, crouched inhumation*Bracer:* 1*Chronology:* stage 2*Reference:* Horáková-Jansová 1932; Sangmeister 1964; 1974; Dvořák/Šebela 1992; Metzinger-Schmidt 2004; Olivík 2009; Matějčková/Dvořák 2012**CZ139 – Jezeřany-Maršovice, grave 67, Znojmo, Moravia***Burial:* ring-ditch/pit, left-sided inhumation (sex: M; age: 30–40)*Bracer:* 1*Position in grave:* between the pelvis and the rib cage*Chronology:* stage 1*Reference:* Langová/Rakovský 1981; Dvořák 1993; Přichystal 2000; Metzinger-Schmidt 2004; Bosch 2008; Růžičková 2008; 2009; Kopacz et al. 2009; Olivík 2009**CZ140 – Lechovice, grave 5, Znojmo, Moravia***Burial:* ring-ditch/pit, cremation (sex: ?; age: 20–)*Bracer:* 1*Chronology:* stage 3*Reference:* Medunová/Ondráček 1969; Sangmeister 1974; Metzinger-Schmidt 2004; Bosch 2008; Olivík 2009**CZ141 – Střelice, grave 8/1926, Znojmo, Moravia***Burial:* pit?, left-sided inhumation*Bracer:* 1*Chronology:* stage 3*Reference:* Kuna/Matoušek 1978; Metzinger-Schmidt 2004; Kopacz et al. 2009; Tůmová 2008; Olivík 2009; Merkl 2011; Matějčková/Dvořák 2012**CZ142 – Tešetice, grave 4, Znojmo, Moravia***Burial:* pit, cremation*Bracer:* 1*Chronology:* stage 2*Reference:* Koštuřík 1971; Sangmeister 1974; Metzinger-Schmidt 2004; Olivík 2009; Matějčková/Dvořák 2012**CZ143 – Těšetice-Kyjovice 'Sutny', grave 27, Znojmo, Moravia***Burial:* ring-ditch/pit, wooden structure, left-sided inhumation (sex: M; age: 45–55)*Bracer:* 2*Position in grave:* one at the forearms, one deposited with grave offerings*Chronology:* stage 2, 3940 ± 40 BP (Poz-44322), dagger wooden sheath, 2568 –2299 cal BC (95.4 %)*Reference:* Kazdová et al. 2011; 2012; Petřík et al. 2012**CZ144 – Tvořihráz, grave 2/91, Znojmo, Moravia***Burial:* ring-ditch/pit, multiple cremation (sex: ?, ?, ?, ?, ?; age: 2, 3–5, 7–9, 10, 10+)*Bracer:* 1*Chronology:* stage 1, 3869±40 BP (Bln-4497), charcoal, 2467–2208 cal BC (95.4%); 3746±52 BP (Bln-4498), charcoal, 2335–1980 cal BC (95.4%); 3771±44 BP (Bln-4499), charcoal, 2339–2036 cal BC (95.4%); 4011±52 BP (Bln-4500), charcoal, 2850–2348 cal BC (95.4%); 3838±42 BP (Bln-4501), charcoal, 2462–2152 cal BC (95.4%)*Reference:* Dvořák 1993; Bálek et al. 1999; Metzinger-Schmidt 2004; Bosch 2008; Olivík 2009**CZ145 – Únanov II, grave 1/37, Znojmo, Moravia***Burial:* pit?, inhumation*Bracer:* 1*Chronology:* stage?*Reference:* Tůmová 2008; Olivík 2009**CZ146 – Vedrovice, Znojmo, Moravia***Burial:* pit?, cremation*Bracer:* 1*Chronology:* stage 2*Reference:* Dvořák/Šebela 1992; Metzinger-Schmidt 2004; Olivík 2009



**CZ147 – Vémyslice I, grave 2/47, Znojmo, Moravia**  
*Burial:* pit?, left-sided inhumation (sex: M; age: 20–)  
*Bracer:* 1  
*Chronology:* stage 3  
*Reference:* Tůmová 2008; Olivík 2009;  
 Matějčíková/Dvořák 2012

## Germany

**G001 – Heilbronn 'Klingenberg', Heilbronn, Baden-Württemberg**  
*Burial:* pit?, left-sided inhumation  
*Bracer:* 1  
*Chronology:* stage 2  
*Reference:* Biel 1987; Heyd 2000

**G002 – Ingelfingen 'Criesbach', Hohenlohekreis, Bade-Wurtemberg**  
*Burial:* pit?, inhumation  
*Bracer:* 1  
*Chronology:* stage?  
*Reference:* Sangmeister 1974; Heyd 2000

**G003 – Stockach 'Wahlwies', Konstanz, Baden-Württemberg**  
*Burial:* pit, inhumation?  
*Bracer:* 1  
*Chronology:* stage 2  
*Reference:* Wagner 1908; Sangmeister 1974; Heyd 2000

**G004 – Kornwestheim, Ludwigsburg, Baden-Württemberg**  
*Burial:* pit, wooden structure, left-sided inhumation  
*Bracer:* 1  
*Chronology:* stage 3  
*Reference:* Sangmeister 1974; Heyd 2000

**G005 – Bopfingen 'Flochberg', Ostalb, Baden-Württemberg**  
*Burial:* pit?, double inhumation (1 left-sided) (sex: M, ?; age: 20, 0–20)  
*Bracer:* 1  
*Chronology:* stage 2  
*Reference:* Krause 1989; Krause/Wieland 1993; Heyd 2000

**G006 – Wiesloch, Rhein-Neckar, Baden-Württemberg**  
*Burial:* pit, left-sided inhumation  
*Bracer:* 1  
*Chronology:* stage 2  
*Reference:* Wagner 2011

**G007 – Schwäbisch-Hall 'Hessental', Schwäbisch-Hall, Baden-Württemberg**  
*Burial:* pit, inhumation?  
*Bracer:* 1  
*Chronology:* stage 2  
*Reference:* Heyd 2000

**G008 – Stühlingen, Waldshut, Baden-Württemberg**  
*Burial:* pit, left-sided inhumation  
*Bracer:* 1  
*Chronology:* stage 2  
*Reference:* Gersbach 1969; Heyd 2000

**G009 – Augsburg 'Haunstetten' I, Augsburg, Bavaria**  
*Burial:* pit, left-sided inhumation (sex: M; age: 20–35)  
*Bracer:* 1  
*Chronology:* stage?  
*Reference:* Bakker 1986; 1987; 1990; Kociumaka/Dietrich 1991; Kociumaka 1996; Heyd 2000; Bosch 2008

**G010 – Augsburg, grave?, Augsburg, Bavaria**  
*Burial:* pit?, inhumation (sex: M; age: 20–)  
*Bracer:* 1  
*Chronology:* stage?  
*Reference:* Kociumaka/Dietrich 1991; Kociumaka 1992; 1996; Heyd 2000

**G011 – Augsburg, grave?, Augsburg, Bavaria**  
*Burial:* pit?, inhumation (sex: M; age: 20–)  
*Bracer:* 1  
*Chronology:* stage?  
*Reference:* Kociumaka/Dietrich 1991; Kociumaka 1992; 1996; Heyd 2000

**G012 – Augsburg, grave 3, Augsburg, Bavaria**  
*Burial:* pit, left-sided inhumation (sex: M; age: 20–)  
*Bracer:* 1  
*Chronology:* stage 2  
*Reference:* Kociumaka/Dietrich 1991; Kociumaka 1992; 1996; Heyd 2000

**G013 – Haunersdorf, grave 1, Deggendorf, Bavaria**  
*Burial:* pit?, left-sided inhumation (sex: M; age: 20–)  
*Bracer:* 1  
*Position in grave:* at the left forearm  
*Chronology:* stage?  
*Reference:* Sangmeister 1964; 1974; Bill 1976; Ruckdeschel 1978; Heyd 2000; Bosch 2008

**G014 – Künzing 'Bruck' III, grave 9, Deggendorf, Bavaria**  
*Burial:* pit, left-sided inhumation (sex: M; age: 20–)  
*Bracer:* 1  
*Chronology:* stage 2  
*Reference:* Schmotz 1991b; 1992; Heyd 2000; Bosch 2008

**G015 – Osterhofen 'Altenmarkt' III, grave 2, Deggendorf, Bavaria**  
*Burial:* pit, left-sided inhumation  
*Bracer:* 1  
*Chronology:* stage 3  
*Reference:* Schmotz 1989; 1991a; 1994; Heyd 2000; Bosch 2008

**G016 – Osterhofen 'Altenmarkt' III, grave 5, Deggendorf, Bavaria**  
*Burial:* pit, left-sided inhumation (sex: M; age: 20–)  
*Bracer:* 1  
*Position in grave:* at the left forearm  
*Chronology:* stage 2  
*Reference:* Schmotz 1989; 1991a; 1994; Heyd 2000; Bosch 2008

**G017 – Osterhofen 'Altenmarkt' III, grave 6, Deggendorf, Bavaria**  
*Burial:* pit, left-sided inhumation (sex: M; age: 20–)  
*Bracer:* 1  
*Chronology:* stage 2  
*Reference:* Schmotz 1989; 1991a; 1994; Heyd 2000; Bosch 2008

**G018 – Osterhofen 'Altenmarkt' III, grave 10, Deggen-****dorf, Bavaria***Burial:* pit?, left-sided inhumation*Bracer:* 1*Chronology:* stage 3*Reference:* Schmotz 1989; 1991a; 1994; Heyd 2000; Bosch 2008**G019 – Dillingen an der Donau 'Reitweg', Dillingen a. d.****Donau, Bavaria***Burial:* pit?, left-sided inhumation (sex: M; age: 20–)*Bracer:* 1*Chronology:* stage 3*Reference:* Sangmeister 1964; 1974; Bill 1976; Schröter 1976; Ruckdeschel 1978; Kreiner 1988; Engelhardt 1998; Heyd 2000; Bosch 2008**G020 – Aufhausen, Dingolfing-Landau, Bavaria***Burial:* pit, cremation*Bracer:* 1*Position in grave:* beside the cremation*Chronology:* stage 2*Reference:* Kreiner et al. 1998; Heyd 2000; Bosch 2008**G021 – Landau I, Dingolfing-Landau, Bavaria***Burial:* pit, left-sided inhumation (sex: M; age: 20–)*Bracer:* 1*Position in grave:* at the left forearm*Chronology:* stage 2*Reference:* Christlein 1981; Husty 1999; 2004; Heyd 2000**G022 – Landau III, grave 1, Dingolfing-Landau, Bavaria***Burial:* pit, left-sided inhumation (sex: ?; age: 0–6)*Bracer:* 1*Position in grave:* deposited with the ceramic*Chronology:* stage 2*Reference:* Husty 1992; 1994; 1999; 2004; Kreiner 1995; Heyd 2000; Bosch 2008**G023 – Triefing, grave 1, Dingolfing-Landau, Bavaria***Burial:* ring-ditch/pit, left-sided inhumation (sex: M; age: 20–)*Bracer:* 1*Position in grave:* at the left forearm*Chronology:* stage 1*Reference:* Engelhardt 1989; Kreiner 1991a; 1991b; Heyd 2000; Bosch 2008**G024 – Eitensheim, grave 7, Eichstätt, Bavaria***Burial:* pit, left-sided inhumation (sex: M; age: 20–)*Bracer:* 1*Chronology:* stage 3*Reference:* Meixner/Weinig 2002; Bosch 2008**G025 – Großmehring I, Eichstätt, Bavaria***Burial:* grave?*Bracer:* 1*Chronology:* stage?*Reference:* Schiermaisen 1936; Ruckdeschel 1978; Rieder 1986a; Heyd 2000; Bosch 2008**G026 – Nassenfels, grave 101, Eichstätt, Bavaria***Burial:* pit, wooden structure?, inhumation?*Bracer:* 1*Chronology:* stage 3*Reference:* O'Neill 2010**G027 – Offingen, grave 4, Günzburg, Bavaria***Burial:* pit, wooden structure, left-sided inhumation (sex: M; age: 20–)*Bracer:* 1*Chronology:* stage 3*Reference:* Ruckdeschel 1978; Schröter 1997; Heyd 2000**G028 – Ergolding, Landshut, Bavaria***Burial:* pit?, inhumation*Bracer:* 1*Chronology:* stage?*Reference:* Heyd 2000**G029 – München 'Sendling', grave 3, München, Bavaria***Burial:* pit, left-sided inhumation*Bracer:* 1*Chronology:* stage 2*Reference:* Müller-Karpe 1961; 1974; Ruckdeschel 1978; Heyd 2000; Bosch 2008**G030 – München 'Sendling', grave 4, München, Bavaria***Burial:* pit, right-sided inhumation*Bracer:* 1*Chronology:* stage 2*Reference:* Müller-Karpe 1961; 1974; Ruckdeschel 1978; Heyd 2000; Bosch 2008**G031 – München West, München, Bavaria***Burial:* ring-ditch/pit, right-sided/left-sided double inhumation (sex: F, ?; age: 30–35, 10)*Bracer:* 1*Chronology:* stage 2*Reference:* Guckenbiehl/Schreiber 2008**G032 – Weichering, grave 18, Neuburg-Schrobenhausen, Bavaria***Burial:* pit, left-sided inhumation (sex: M; age: 20–)*Bracer:* 1*Chronology:* stage 3*Reference:* Weinig 1991; Heyd 2000; Bosch 2008**G033 – Reusch, Neustadt an der Aisch-Bad Windsheim, Bavaria***Burial:* pit?, inhumation?*Bracer:* 1*Chronology:* stage?*Reference:* Sangmeister 1974; Heyd 2000**G034 – Safferstetten, grave 1, Passau, Bavaria***Burial:* pit?, inhumation*Bracer:* 1*Chronology:* stage 3*Reference:* Pätzold/Uenze 1963; Sangmeister 1974; Ruckdeschel 1978; Heyd 2000; Bosch 2008**G035 – Oberstimm I, grave 1, Pfaffenhofen an der Ilm, Bavaria***Burial:* ring-ditch/pit, right-sided inhumation (sex: M; age: 20–)*Bracer:* 1*Position in grave:* at the left elbow*Chronology:* stage 2*Reference:* Rieder 1982a; 1982b; 1983; Heyd 2000; Bosch 2008

- G036 – Oberstimm I, grave 2, Pfaffenhofen an der Ilm, Bavaria**  
*Burial:* ring-ditch/pit, left-sided inhumation (sex: M; age: 20–)  
*Bracer:* 1  
*Position in grave:* at the left forearm  
*Chronology:* stage 2  
*Reference:* Rieder 1982a; 1982b; 1983; Heyd 2000; Bosch 2008
- G037 – Oberstimm II, grave 2, Pfaffenhofen an der Ilm, Bavaria**  
*Burial:* pit, Extended inhumation (sex: M; age: 20–)  
*Bracer:* 1  
*Chronology:* stage?  
*Reference:* Rieder 1986a; 1986b; Heyd 2000; Bosch 2008
- G038 – Barbing I, grave 3, Regensburg, Bavaria**  
*Burial:* pit?, left-sided inhumation (sex: M; age: 20–)  
*Bracer:* 1  
*Position in grave:* inside the right forearm  
*Chronology:* stage 2  
*Reference:* Eckes 1952; Sangmeister 1964; 1974; Bill 1976; Ruckdeschel 1978; Heyd 2000; Bosch 2008
- G039 – Barbing II, Regensburg, Bavaria**  
*Burial:* ring-ditch/pit, left-sided inhumation (sex: M; age: 20–)  
*Bracer:* 1  
*Position in grave:* outside the left forearm  
*Chronology:* stage 3  
*Reference:* Engelhardt 2010
- G040 – Burgweinting, grave 3092, Regensburg, Bavaria**  
*Burial:* pit, left-sided inhumation (sex: M; age: 20–35)  
*Bracer:* 1  
*Position in grave:* at the forearms  
*Chronology:* stage 3  
*Reference:* Schröter 2005; Bosch 2008
- G041 – Straubing-Alburg II 'Lerchenaid', Straubing, Bavaria**  
*Burial:* grave?  
*Bracer:* 1  
*Chronology:* stage?  
*Reference:* Hundt 1958; Heyd 2000
- G042 – Straubing-Alburg IV 'Stadtäcker', Straubing, Bavaria**  
*Burial:* pit?, left-sided inhumation  
*Bracer:* 1  
*Chronology:* stage 3  
*Reference:* Heyd 2000; Bosch 2008
- G043 – Straubing-Gabelsbergerstraße, grave 2, Straubing, Bavaria**  
*Burial:* pit, inhumation (sex: M; age: 20–)  
*Bracer:* 1  
*Chronology:* stage 3  
*Reference:* Hundt 1958; Heyd 2000; Bosch 2008
- G044 – Straubing-Gabelsbergerstraße, grave 3, Straubing, Bavaria**  
*Burial:* pit, inhumation?  
*Bracer:* 1  
*Chronology:* stage 3  
*Reference:* Hundt 1958; Heyd 2000; Bosch 2008

- G045 – Mitterharthausen, Straubing-Bogen, Bavaria**  
*Burial:* pit, left-sided inhumation  
*Bracer:* 1  
*Chronology:* stage?  
*Reference:* Hundt 1958; Heyd 2000; Bosch 2008

- G046 – Ochsenfurt, Würzburg, Bavaria**  
*Burial:* pit?, inhumation?  
*Bracer:* 1  
*Chronology:* stage?  
*Reference:* Sangmeister 1974; Heyd 2000

## Hungary

- H001 – Budapest–Békásmegyer, grave 128, Budapest, Budapest**  
*Burial:* pit?, cremation  
*Bracer:* 1  
*Chronology:* stage 2  
*Reference:* Kalicz-Schreiber 1976; Kalicz-Schreiber/Kalicz 1998; 1999; 2000

- H002 – Budapest–Békásmegyer, grave 432/a, Budapest, Budapest**  
*Burial:* pit?, inhumation  
*Bracer:* 1  
*Chronology:* stage 2  
*Reference:* Kalicz-Schreiber 1976; Kalicz-Schreiber/Kalicz 1998; 1999; 2000

- H003 – Budapest–Békásmegyer, grave 471, Budapest, Budapest**  
*Burial:* pit?, cremation  
*Bracer:* 1  
*Chronology:* stage 2  
*Reference:* Kalicz-Schreiber 1976; Kalicz-Schreiber/Kalicz 1998; 1999; 2000

- H004 – Budapest-Csepel 'Rákóczi Ferenc street', grave 1, Budapest, Budapest**  
*Burial:* pit, left-sided inhumation  
*Bracer:* 1  
*Chronology:* stage 2  
*Reference:* Endrődi/Horváth 1999; Endrődi 2002; 2013

- H005 – Budapest-Csepel, Waste Water Treatment Plant, Budapest, Budapest**  
*Burial:* pit?, cremation  
*Bracer:* x  
*Chronology:* stage?  
*Reference:* Horváth et al. 2007; Horváth/Endrődi 2008; Endrődi et al. 2008; Kulcsár 2011

- H006 – Budakalász 'Luppa-csárda', grave 14, Szentendre, Pest**  
*Burial:* pit?, urned cremation (sex: F; age: 23–)  
*Bracer:* 1  
*Chronology:* stage?  
*Reference:* Ottományi/Czene 2006; Czene 2008; Horváth 2013

- H007 – Budakalász 'Luppa-csárda', grave 106, Szentendre, Pest**  
*Burial:* pit?, cenotaph?  
*Bracer:* 1  
*Chronology:* stage?  
*Reference:* Ottományi/Czene 2006; Czene 2008; Horváth 2013
- H008 – Budakalász 'Luppa-csárda', grave 107, Szentendre, Pest**  
*Burial:* pit?, urned cremation (sex: ?; age: 23–)  
*Bracer:* 1  
*Chronology:* stage?  
*Reference:* Ottományi/Czene 2006; Czene 2008; Horváth 2013
- H009 – Budakalász 'Luppa-csárda', grave 157, Szentendre, Pest**  
*Burial:* pit?, cremation  
*Bracer:* 1  
*Chronology:* stage?  
*Reference:* Ottományi/Czene 2006; Czene 2008; Horváth 2013
- H010 – Budakalász 'Luppa-csárda', grave 171, Szentendre, Pest**  
*Burial:* pit?, urned cremation (sex: M; age: 23–)  
*Bracer:* 1  
*Chronology:* stage?  
*Reference:* Ottományi/Czene 2006; Czene 2008; Horváth 2013
- H011 – Budakalász 'Luppa-csárda', grave 185, Szentendre, Pest**  
*Burial:* pit?, cremation  
*Bracer:* 1  
*Chronology:* stage?  
*Reference:* Ottományi/Czene 2006; Czene 2008; Horváth 2013
- H012 – Budakalász 'Luppa-csárda', grave 196, Szentendre, Pest**  
*Burial:* pit?, urned cremation (sex: F; age: 23–)  
*Bracer:* 1  
*Chronology:* stage?  
*Reference:* Ottományi/Czene 2006; Czene 2008; Horváth 2013
- H013 – Budakalász 'Luppa-csárda', grave 203, Szentendre, Pest**  
*Burial:* grave?  
*Bracer:* 1  
*Chronology:* stage?  
*Reference:* Ottományi/Czene 2006; Czene 2008; Horváth 2013
- H014 – Budakalász 'Luppa-csárda', grave 278, Szentendre, Pest**  
*Burial:* pit?, cremation  
*Bracer:* 1  
*Chronology:* stage?  
*Reference:* Ottományi/Czene 2006; Czene 2008; Horváth 2013
- H015 – Budakalász 'Luppa-csárda', grave 285, Szentendre, Pest**  
*Burial:* pit?, Urned cremation  
*Bracer:* 1  
*Chronology:* stage?  
*Reference:* Ottományi/Czene 2006; Czene 2008; Horváth 2013
- H016 – Budakalász 'Luppa-csárda', grave 347, Szentendre, Pest**  
*Burial:* pit?, urned cremation (sex: M; age: 30–50)

- Bracer:* 1  
*Chronology:* stage?  
*Reference:* Ottományi/Czene 2006; Czene 2008; Horváth 2013
- H017 – Budakalász 'Luppa-csárda', grave 467, Szentendre, Pest**  
*Burial:* pit?, cenotaph?  
*Bracer:* 1  
*Chronology:* stage?  
*Reference:* Ottományi/Czene 2006; Czene 2008; Horváth 2013
- H018 – Budakalász 'Luppa-csárda', grave 484, Szentendre, Pest**  
*Burial:* pit?, cremation (sex: F; age: 23–59)  
*Bracer:* 1  
*Chronology:* stage?  
*Reference:* Ottományi/Czene 2006; Czene 2008; Horváth 2013
- H019 – Budakalász 'Luppa-csárda', grave 530, Szentendre, Pest**  
*Burial:* pit?, urned cremation (sex: F?; age: 23–59)  
*Bracer:* 1  
*Chronology:* stage?  
*Reference:* Ottományi/Czene 2006; Czene 2008; Horváth 2013
- H020 – Budakalász 'Luppa-csárda', grave 551, Szentendre, Pest**  
*Burial:* pit?, urned cremation (sex: M; age: 23–)  
*Bracer:* 1  
*Chronology:* stage?  
*Reference:* Ottományi/Czene 2006; Czene 2008; Horváth 2013
- H021 – Budakalász 'Luppa-csárda', grave 614, Szentendre, Pest**  
*Burial:* pit?, urned cremation (sex: ?; age: 23–)  
*Bracer:* 1  
*Chronology:* stage?  
*Reference:* Ottományi/Czene 2006; Czene 2008; Horváth 2013
- H022 – Budakalász 'Luppa-csárda', grave 616, Szentendre, Pest**  
*Burial:* pit?, inhumation (sex: F?; age: 23–59)  
*Bracer:* 1  
*Chronology:* stage?  
*Reference:* Ottományi/Czene 2006; Czene 2008; Horváth 2013
- H023 – Budakalász 'Luppa-csárda', grave 847, Szentendre, Pest**  
*Burial:* pit?, inhumation (sex: M; age: 23–)  
*Bracer:* 1  
*Chronology:* stage?  
*Reference:* Ottományi/Czene 2006; Czene 2008; Horváth 2013
- H024 – Budakalász 'Luppa-csárda', grave 884, Szentendre, Pest**  
*Burial:* pit?, urned cremation (sex: M; age: 23–)  
*Bracer:* 1  
*Chronology:* stage?  
*Reference:* Ottományi/Czene 2006; Czene 2008; Horváth 2013
- H025 – Budakalász 'Luppa-csárda', grave 901, Szentendre, Pest**  
*Burial:* pit?, urned cremation (sex: M; age: 23–)  
*Bracer:* 1  
*Chronology:* stage?  
*Reference:* Ottományi/Czene 2006; Czene 2008; Horváth 2013

- H026 – Budakalász 'Luppa-csárda', grave 925, Szentendre, Pest**  
*Burial:* pit?, urned cremation (sex: M; age: 23–)  
*Bracer:* 1  
*Chronology:* stage?  
*Reference:* Ottományi/Czene 2006; Czene 2008; Horváth 2013
- H027 – Budakalász 'Luppa-csárda', grave 936, Szentendre, Pest**  
*Burial:* pit?, urned cremation (sex: M; age: 23–)  
*Bracer:* 1  
*Chronology:* stage?  
*Reference:* Ottományi/Czene 2006; Czene 2008; Horváth 2013
- H028 – Budakalász 'Luppa-csárda', grave 945, Szentendre, Pest**  
*Burial:* pit?, urned cremation (sex: ?; age: 23–)  
*Bracer:* 1  
*Chronology:* stage?  
*Reference:* Ottományi/Czene 2006; Czene 2008; Horváth 2013
- H029 – Budakalász 'Luppa-csárda', grave 979, Szentendre, Pest**  
*Burial:* pit?, cremation  
*Bracer:* 1  
*Chronology:* stage?  
*Reference:* Ottományi/Czene 2006; Czene 2008; Horváth 2013
- H030 – Budakalász 'Luppa-csárda', grave 990, Szentendre, Pest**  
*Burial:* pit?, urned cremation (sex: F; age: 23–)  
*Bracer:* 1  
*Chronology:* stage?  
*Reference:* Ottományi/Czene 2006; Czene 2008; Horváth 2013
- H031 – Budakalász 'Luppa-csárda', grave 1024, Szentendre, Pest**  
*Burial:* pit?, urned cremation (sex: M; age: 23–59)  
*Bracer:* 1  
*Chronology:* stage?  
*Reference:* Ottományi/Czene 2006; Czene 2008; Horváth 2013
- H032 – Budakalász 'Luppa-csárda', grave 1082, Szentendre, Pest**  
*Burial:* pit?, inhumation (sex: ?; age: 20–)  
*Bracer:* 1  
*Chronology:* stage?  
*Reference:* Ottományi/Czene 2006; Czene 2008; Horváth 2013
- H033 – Budakalász 'Luppa-csárda', grave 1118, Szentendre, Pest**  
*Burial:* pit?, cremation (sex: ?; age: 1–7)  
*Bracer:* 2  
*Chronology:* stage?  
*Reference:* Ottományi/Czene 2006; Czene 2008; Horváth 2013
- H034 – Budakalász 'Luppa-csárda', grave 1259, Szentendre, Pest**  
*Burial:* pit?, cremation (sex: ?; age: 23–)  
*Bracer:* 1  
*Chronology:* stage?  
*Reference:* Ottományi/Czene 2006; Czene 2008; Horváth 2013
- H035 – Budakalász 'Luppa-csárda', grave 1265, Szentendre, Pest**  
*Burial:* grave?

*Bracer:* 2  
*Chronology:* stage?  
*Reference:* Ottományi/Czene 2006; Czene 2008; Horváth 2013

**H036 – Budakalász 'Luppa-csárda', grave 1274, Szentendre, Pest**

*Burial:* pit?, cenotaph?  
*Bracer:* 1  
*Chronology:* stage?  
*Reference:* Ottományi/Czene 2006; Czene 2008; Horváth 2013

**H037 – Budakalász 'Luppa-csárda', grave 1288, Szentendre, Pest**

*Burial:* pit?, cenotaph?  
*Bracer:* 1  
*Chronology:* stage?  
*Reference:* Ottományi/Czene 2006; Czene 2008; Horváth 2013

**H038 – Budakalász 'Tangzdaság', grave 1, Szentendre, Pest**

*Burial:* pit?, urned cremation  
*Bracer:* 1  
*Chronology:* stage 3  
*Reference:* Kalicz 1955

**H039 – Szigetszentmiklós 'Felső Ürge-hegyi dűlő', grave 40, Szigetszentmiklós, Pest**

*Burial:* pit, cenotaph?  
*Bracer:* 1  
*Chronology:* stage 3  
*Reference:* Patay 2008; 2013

**H040 – Szigetszentmiklós 'Felső Ürge-hegyi dűlő', grave 49, Szigetszentmiklós, Pest**

*Burial:* pit, left-sided inhumation (sex: M; age: 40–50)  
*Bracer:* 1  
*Position in grave:* outside the left forearm  
*Chronology:* stage 2, 3830 ± 40 BP (VERA-4749), human bone, 2459–2148 cal BC (95.4 %)  
*Reference:* Patay 2008; 2013

**H041 – Szigetszentmiklós 'Felső Ürge-hegyi dűlő', grave 76–77, Szigetszentmiklós, Pest**

*Burial:* pit, cenotaph?  
*Bracer:* 2  
*Chronology:* stage 2  
*Reference:* Patay 2008; 2013

**H042 – Szigetszentmiklós 'Felső Ürge-hegyi dűlő', grave 84, Szigetszentmiklós, Pest**

*Burial:* pit, cremation (sex: ?; age: 23–59)  
*Bracer:* 1  
*Position in grave:* beside the pile of burnt bones  
*Chronology:* stage 3  
*Reference:* Patay 2008; 2013

**H043 – Szigetszentmiklós 'Felső Ürge-hegyi dűlő', grave 107, Szigetszentmiklós, Pest**

*Burial:* pit, double burial (1 left-sided inhumation, 1 cremation) (sex: M, M; age: 50–60, 23–59)  
*Bracer:* 1  
*Position in grave:* with the pile of burnt bones  
*Chronology:* stage 2  
*Reference:* Patay 2008; 2013

**H044 – Szigetszentmiklós 'Felső Ürge-hegyi dűlő', grave 128, Szigetszentmiklós, Pest***Burial:* ring-ditch/pit, cremation (sex: M?; age: 23–59)*Bracer:* 1*Position in grave:* with the pile of burnt bones*Chronology:* stage 2*Reference:* Patay 2008; 2013**H045 – Szigetszentmiklós 'Felső Ürge-hegyi dűlő', grave 146, Szigetszentmiklós, Pest***Burial:* pit, cenotaph?*Bracer:* 1*Chronology:* stage 2*Reference:* Patay 2008; 2013**H046 – Szigetszentmiklós 'Felső Ürge-hegyi dűlő', grave 162, Szigetszentmiklós, Pest***Burial:* pit?, double burial (1 left-sided inhumation, 1 cremation) (sex: M?, ?; age: 30–50, ?)*Bracer:* 1*Chronology:* stage?*Reference:* Patay 2008; 2013**H047 – Szigetszentmiklós 'Felső Ürge-hegyi dűlő', grave 164, Szigetszentmiklós, Pest***Burial:* pit, cremation (sex: M?; age: 23–59)*Bracer:* 1*Position in grave:* with the pile of burnt bones*Chronology:* stage 2*Reference:* Patay 2008; 2013**H048 – Szigetszentmiklós 'Felső Ürge-hegyi dűlő', grave 216, Szigetszentmiklós, Pest***Burial:* ring-ditch/pit, cenotaph?*Bracer:* 1*Chronology:* stage 2*Reference:* Patay 2008; 2013**H049 – Szigetszentmiklós 'Felső Ürge-hegyi dűlő', grave 225, Szigetszentmiklós, Pest***Burial:* pit, double cremation (sex: M?, ?; age: 23–59, 23–59)*Bracer:* 1*Position in grave:* with the pile of burnt bones*Chronology:* stage 2*Reference:* Patay 2008; 2013**H050 – Szigetszentmiklós 'Felső Ürge-hegyi dűlő', grave 314, Szigetszentmiklós, Pest***Burial:* pit, cremation*Bracer:* 1*Position in grave:* beside the pile of burnt bones*Chronology:* stage 2*Reference:* Patay 2008; 2013**H051 – Szigetszentmiklós 'Felső Ürge-hegyi dűlő', grave 339, Szigetszentmiklós, Pest***Burial:* semi-circular ditch/pit, cremation (sex: M?; age: 23–)*Bracer:* 1*Position in grave:* with the pile of burnt bones*Chronology:* stage 2*Reference:* Patay 2008; 2013**H052 – Szigetszentmiklós 'Felső Ürge-hegyi dűlő', grave 341, Szigetszentmiklós, Pest***Burial:* curved ditch/pit, left-sided inhumation (sex: M?; age: 23–59)*Bracer:* 1*Chronology:* stage 3*Reference:* Patay 2008; 2013**H053 – Szigetszentmiklós 'Felső Ürge-hegyi dűlő', grave 362, Szigetszentmiklós, Pest***Burial:* pit, Multiple cremation (sex: M?, M?, ?, ?, ?, ?, ?; age: 23–59, 23–59, 23–59, ?, ?, ?)*Bracer:* 1*Position in grave:* beside the pile of burnt bones*Chronology:* stage 2*Reference:* Patay 2008; 2013**H054 – Szigetszentmiklós 'Felső Ürge-hegyi dűlő', grave 374, Szigetszentmiklós, Pest***Burial:* pit, cenotaph?*Bracer:* 1*Chronology:* stage 3*Reference:* Patay 2008; 2013**H055 – Szigetszentmiklós 'Felső Ürge-hegyi dűlő', grave 383, Szigetszentmiklós, Pest***Burial:* pit, left-sided inhumation (sex: ?; age: 6–8)*Bracer:* 1*Position in grave:* outside the left forearm*Chronology:* stage 2*Reference:* Patay 2008; 2013**H056 – Szigetszentmiklós 'Felső Ürge-hegyi dűlő', grave 385, Szigetszentmiklós, Pest***Burial:* ring-ditch/pit, cenotaph?*Bracer:* 1*Chronology:* stage 2*Reference:* Patay 2008; 2013**H057 – Szigetszentmiklós 'Felső Ürge-hegyi dűlő', grave 409, Szigetszentmiklós, Pest***Burial:* pit, cenotaph?*Bracer:* 1*Chronology:* stage 2*Reference:* Patay 2008; 2013**H058 – Szigetszentmiklós 'Felső Ürge-hegyi dűlő', grave 410, Szigetszentmiklós, Pest***Burial:* pit, left-sided inhumation (sex: M; age: 40–50)*Bracer:* 1*Position in grave:* outside the left forearm*Chronology:* stage 3*Reference:* Patay 2008; 2013**H059 – Szigetszentmiklós 'Felső Ürge-hegyi dűlő', grave 418, Szigetszentmiklós, Pest***Burial:* pit, cremation (sex: ?; age: 23–)*Bracer:* 1*Position in grave:* with the pile of burnt bones*Chronology:* stage 2*Reference:* Patay 2008; 2013**H060 – Szigetszentmiklós 'Felső Ürge-hegyi dűlő', grave 433, Szigetszentmiklós, Pest***Burial:* pit, cenotaph?*Bracer:* 2*Chronology:* stage 1*Reference:* Patay 2008; 2013

**H061 – Szigetszentmiklós 'Felső Űrge-hegyi dűlő', grave 463, Szigetszentmiklós, Pest***Burial:* pit, cenotaph?*Bracer:* 1*Chronology:* stage 2*Reference:* Patay 2008; 2013**H062 – Szigetszentmiklós 'Felső Űrge-hegyi dűlő', grave 483, Szigetszentmiklós, Pest***Burial:* pit, cenotaph?*Bracer:* 1*Chronology:* stage 2*Reference:* Patay 2008; 2013**H063 – Szigetszentmiklós 'Felső Űrge-hegyi dűlő', grave 505, Szigetszentmiklós, Pest***Burial:* ring-ditch/pit, cenotaph?*Bracer:* 1*Chronology:* stage 2*Reference:* Patay 2008; 2013**H064 – Szigetszentmiklós 'Felső Űrge-hegyi dűlő', grave 533, Szigetszentmiklós, Pest***Burial:* ring-ditch/pit, left-sided inhumation (sex: M; age: 40–50)*Bracer:* 1*Position in grave:* at the left forearm*Chronology:* stage 2*Reference:* Patay 2008; 2013**H065 – Szigetszentmiklós 'Felső Űrge-hegyi dűlő', grave 539, Szigetszentmiklós, Pest***Burial:* pit, right-sided inhumation (sex: F; age: 25–35)*Bracer:* 1*Position in grave:* in front of the forearms*Chronology:* stage 2*Reference:* Patay 2008; 2013**H066 – Szigetszentmiklós 'Felső Űrge-hegyi dűlő', grave 544, Szigetszentmiklós, Pest***Burial:* pit, cremation (sex: M?; age: 23–59)*Bracer:* 1*Position in grave:* beside the pile of burnt bones*Chronology:* stage 2*Reference:* Patay 2008; 2013**H067 – Szigetszentmiklós 'Felső Űrge-hegyi dűlő', grave 626, Szigetszentmiklós, Pest***Burial:* pit, left-sided inhumation (sex: M; age: 23–26)*Bracer:* 1*Position in grave:* at the left forearm*Chronology:* stage 2, 3845 ± 35 BP (VERA-4757), human bone, 2458–2204 cal BC (95.4 %)*Reference:* Patay 2008; 2013**H068 – Szigetszentmiklós 'Felső Űrge-hegyi dűlő', grave 634, Szigetszentmiklós, Pest***Burial:* pit, double cremation (sex: M, ?; age: 30–45, 0–4)*Bracer:* 1*Position in grave:* with the pile of burnt bones*Chronology:* stage 2*Reference:* Patay 2008, 2013**H069 – Szigetszentmiklós 'Felső Űrge-hegyi dűlő', grave 637, Szigetszentmiklós, Pest***Burial:* pit, wooden structure, cremation (sex: ?; age: 23–)*Bracer:* 1*Position in grave:* with the pile of burnt bones*Chronology:* stage 2*Reference:* Patay 2008; 2013**H070 – Szigetszentmiklós 'Üdülősor', grave 784, Szigetszentmiklós, Pest***Burial:* ring-ditch/pit, cremation*Bracer:* 1*Chronology:* stage 2*Reference:* Endrődi/Horváth 2009; Endrődi et al. 2010; 2011; Endrődi 2012; 2014**H071 – Szigetszentmiklós 'Üdülősor', grave 863, Szigetszentmiklós, Pest***Burial:* ring-ditch/pit, cremation*Bracer:* 1*Chronology:* stage 2*Reference:* Endrődi/Horváth 2009; Endrődi et al. 2010; 2011; Endrődi 2012; 2014**H072 – Szigetszentmiklós 'Water Works', grave 7, Szigetszentmiklós, Pest***Burial:* pit, cremation*Bracer:* 2*Chronology:* stage 2*Reference:* Endrődi 2013**H073 – Tököl, grave 70, Szigetszentmiklós, Pest***Burial:* pit, crouched inhumation*Bracer:* 1*Chronology:* stage 2*Reference:* Schreiber 1975

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Site no.	Site	District	Region	Country	Conservation	ID no.	Study	State	Burnt	Raw material	Length	Width	Thickness	Section
CZ001	Březno Čachovice, grave 90B	Chomutov	Bohemia	Czech Republic	Oblastní muzeum v Chomutově	8/82–6	yes	1 broken edge	no	Yellow, banded, fine-grained sandstone	91.6	[49.3]	4.6	concavo-convex
CZ002	Bylany I, grave 2	Chrudim	Bohemia	Czech Republic	Národní muzeum	60250	yes	complete	no	Greyish beige, banded, fine-grained sandstone	130.6	52.5	6.8	concavo-convex
CZ002	Bylany I, grave 2	Chrudim	Bohemia	Czech Republic	Národní muzeum	60258	yes	complete	no	Grey/black/green, fibrous metamorphic rock (metabasite? Přichystal, com. pers.)	111.2	23.8	7.7	concavo-convex
CZ003	Lochenice I, grave 13	Hradec Králové	Bohemia	Czech Republic	Hradec Králové Muzeum	24/81–57	yes	2 broken corners	no	White, calcareous sandstone	95.5	[41.8]	5.4	concavo-convex
CZ004	Lochenice I, grave 14	Hradec Králové	Bohemia	Czech Republic	Hradec Králové Muzeum	24/81–12	yes	complete	no	Grey, fine-grained sandstone	114.5	31.1	6.3	concavo-convex
CZ005	Lochenice I, grave 4	Hradec Králové	Bohemia	Czech Republic	Hradec Králové Muzeum	L82	yes	complete	no	Beige, very-fine grained sandstone	73.9	32.9	5.1	concavo-convex
CZ006	Lochenice I, grave 5	Hradec Králové	Bohemia	Czech Republic	–	–	no	–	–	–	–	–	–	–
CZ007	Rosnice, grave I/59	Hradec Králové	Bohemia	Czech Republic	Hradec Králové Muzeum	24044	yes	1 broken edge	no	Greenish grey, banded, fine-grained sandstone	85	29	6.2	concavo-convex
CZ008	Rosnice, grave II/59	Hradec Králové	Bohemia	Czech Republic	Hradec Králové Muzeum	24057	yes	1 broken edge	no	Beige, banded, fine-grained sandstone	103.8	[44.5]	5.7	concavo-convex
CZ009	Starý Bydžov	Hradec Králové	Bohemia	Czech Republic	–	–	no	–	–	–	108	42	–	concavo-convex
CZ010	Svobodné Dvory	Hradec Králové	Bohemia	Czech Republic	Hradec Králové Muzeum	Svob. Dvory 1	yes	3 broken corners	no	Beige, banded, fine-grained sandstone	126.9	[38.1]	6.6	concavo-convex
CZ010	Svobodné Dvory	Hradec Králové	Bohemia	Czech Republic	Hradec Králové Muzeum	Svob. Dvory 2	yes	1 broken edge	no	Greyish green, fine-grained stone	147.3	39.1	5.7	concavo-convex
CZ011	Stehelčevs I	Kladno	Bohemia	Czech Republic	Národní muzeum	60232	yes	1 broken edge, desquamations	no	Brownish beige, fine-grained sandstone	105	37.3	6.1	concavo-convex
CZ012	Stehelčevs III, grave 1	Kladno	Bohemia	Czech Republic	Slaný Muzeum	57.1–62	yes	complete, 2 fragments	no	Beige, banded, fine-grained sandstone	101.3	43.8	5.9	concavo-convex
CZ012	Stehelčevs III, grave 1	Kladno	Bohemia	Czech Republic	Slaný Muzeum	57.1–62	yes	fragment, 1 broken corner	no	Beige, banded, fine-grained sandstone	[45.7]	[34.1]	5.4	concavo-convex
CZ013	Stehelčevs III, grave 2	Kladno	Bohemia	Czech Republic	Slaný Muzeum	57.2–62	yes	2 broken corners	no	Beige, banded, fine-grained sandstone	102	[33.6]	6.5	concavo-convex
CZ014	Zvoleněves II, grave 2	Kladno	Bohemia	Czech Republic	–	–	no	complete	–	–	99.9	31.6	–	flat

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Site no.	General shape	Long sides	Short sides	Flanges	Sangmeister Type	Polishing (outer face)	Polishing (inner face)	Holes	New holes	Attempted holes	Ornamentation	Use wears	Origins of breaks	Reshaping	Comments
CZ001	trapezoidal	concave	concave/convex	-	B	fine	medium	4	-	yes	no	slightly worn	sharp breaks	no	-
CZ002	rectangular	concave	concave/convex	-	B	medium	coarse	4	-	-	no	slightly worn	-	no	-
CZ002	rectangular	convex/straight	convex	-	C	fine	medium	4	-	-	no	worn	-	no	preform
CZ003	rectangular	concave	concave	-	B	medium	medium	4	-	-	no	N/A	taphonomic breaks	no	-
CZ004	rectangular	straight	concave	-	C	fine	medium	4	-	-	no	slightly worn	-	no	-
CZ005	trapezoidal	concave	straight	-	B	fine	medium	4	-	-	no	slightly worn	-	no	-
CZ006	-	-	-	-	-	-	-	4	-	-	-	-	-	-	-
CZ007	trapezoidal	straight	convex	-	C	medium	coarse	2	-	-	no	worn	blunt breaks	no	-
CZ008	trapezoidal	concave	convex	-	B	fine	coarse	4	-	-	no	slightly worn	blunt breaks	no	-
CZ009	-	-	-	-	B/C	-	-	4	-	-	-	-	-	-	-
CZ010	rectangular	straight	concave	-	C	fine	medium	6	-	-	no	worn	blunt breaks	no	-
CZ010	rectangular	straight	concave	-	C	medium	medium	4	-	yes	aligned cup-marks	slightly worn	blunt breaks	no	-
CZ011	rectangular	straight	convex	-	C	medium	abrasion	2	-	-	cup-marks	worn	blunt breaks	no	group of longitudinal large grooves on the upper face
CZ012	rectangular	concave	straight	-	B	fine	coarse	4	-	-	no	slightly worn	-	no	-
CZ012	?	concave	convex	-	B	fine	abrasion	4	2	-	no	very worn	blunt breaks & drilling break	no	-
CZ013	rectangular	concave	convex	-	B	fine	coarse	4	-	-	no	slightly worn	blunt breaks	no	upper face bearing short, transversal striations on its central section (used as wrist-guard?)
CZ014	rectangular	straight	concave/convex	-	D	-	-	4	-	-	no	-	-	-	-

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Site no.	Site	District	Region	Country	Conservation	ID no.	Study	State	Burnt	Raw material	Length	Width	Thickness	Section
CZ015	Kolín VI, grave 14	Kolín	Bohemia	Czech Republic	Regionální muzeum v Kolíně	9111	yes	2 broken corners	no	Black, fine-grained sandstone	97.1	28.3	8	biconvex
CZ016	Třebovle	Kolín	Bohemia	Czech Republic	Regionální muzeum v Kolíně	9127	yes	1 broken corner, 1 broken edge	no	Black, banded, fine-grained sandstone	81.2	30.4	5.7	concavo-convex
CZ017	Mlékovice, grave 1	Kolín	Bohemia	Czech Republic	Regionální muzeum v Kolíně	9125	yes	complete	no	Beige/black, very fine-grained sandstone	72.4	19.2	6.9	biconvex
CZ018	Libochovice II, grave 4	Litoměřice	Bohemia	Czech Republic	Národní muzeum	62989	yes	3 broken corners	no	Yellowish brown, very fine-grained, Cretaceous sandstone (Přichystal 2000, Turek 2004b)	58.4	[28]	5.5	concavo-convex
CZ019	Lovosice I, grave 6	Litoměřice	Bohemia	Czech Republic	–	–	no	–	–	–	–	–	–	–
CZ020	Roudnice nad Labem	Litoměřice	Bohemia	Czech Republic	–	–	no	–	–	–	155	54	5	concavo-convex
CZ021	Štětí nad Labem	Litoměřice	Bohemia	Czech Republic	Regionální muzeum v Teplicích	2874	yes	1 broken edge	no	Carboniferous aleuropelite (Turek 2004b)	99.1	41.9	5.5	concavo-convex
CZ022	Sulejovice, grave 3	Litoměřice	Bohemia	Czech Republic	–	–	no	complete	–	–	121	46	10	concavo-convex
CZ023	Žabovřesky, grave II	Litoměřice	Bohemia	Czech Republic	–	–	no	complete	–	–	88	46.4	–	concavo-convex
CZ024	Přivory	Mělník	Bohemia	Czech Republic	–	–	no	–	–	–	60	–	–	flat
CZ025	Tišice, grave 77/99	Mělník	Bohemia	Czech Republic	ARUP, Praha	77–13	yes	2 broken corners	–	Silicified aleuropelite (Turek 2004b)	128.1	52	8.3	concavo-convex
CZ025	Tišice, grave 77/99	Mělník	Bohemia	Czech Republic	ARUP, Praha	77–5	yes	2 broken corners	–	Silicified aleuropelite (Turek 2004b)	131	49.2	6.5	concavo-convex
CZ026	Tišice-Chrást I, grave 1	Mělník	Bohemia	Czech Republic	Národní muzeum	90063	yes	complete	yes	Fine-grained sandstone	118.6	44	5.5	concavo-convex
CZ027	Tišice-Chrást II, grave 1	Mělník	Bohemia	Czech Republic	–	–	no	–	–	–	–	–	–	–
CZ028	Tišice-Chrást II, grave 2	Mělník	Bohemia	Czech Republic	–	–	no	–	–	–	–	–	–	–
CZ029	Neratovice	Mělník	Bohemia	Czech Republic	Národní muzeum	18617	yes	half	no	Yellow, banded, fine-grained sandstone	[81.3]	41.4	5.3	concavo-convex
CZ030	Neratovice I, grave 1	Mělník	Bohemia	Czech Republic	Národní muzeum	39777	yes	chipped edge	no	Purple, banded, fine-grained sandstone	113.6	32.9	5.7	concavo-convex

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Appendix 3, continued. Detailed inventory of Bracer Ornaments from Czech Republic and Hungary.

Site no.	General shape	Long sides	Short sides	Flanges	Sangmeister Type	Polishing (outer face)	Polishing (inner face)	Holes	New holes	Attempted holes	Ornamentation	Use wears	Origins of breaks	Reshaping	Comments
CZ015	rectangular	straight	convex	-	D	medium	medium	4	-	-	no	worn	blunt breaks	no	-
CZ016	trapezoidal	concave	convex	-	B	fine	medium	2	-	-	no	slightly worn	blunt breaks	no	-
CZ017	rectangular	concave	convex	-	E	fine	medium	4	-	-	no	slightly worn	-	no	-
CZ018	trapezoidal	concave/straight	convex/straight	-	B	fine	fine	4	-	-	incised parallel lines	slightly worn	sharp and blunt breaks	no	-
CZ019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CZ020	-	-	-	-	B/C	-	-	4	-	-	no	-	-	-	-
CZ021	rectangular	concave	straight	-	B	medium	abrasion	4	-	yes	no	slightly worn	blunt breaks	no	-
CZ022	trapezoidal	concave	straight	-	B	-	-	4	-	-	no	-	-	-	-
CZ023	trapezoidal	straight	convex	-	C	-	-	4	-	-	no	-	-	-	-
CZ024	-	-	-	-	D/E	-	-	4	-	-	-	-	-	-	-
CZ025	rectangular	concave	convex	-	B	fine	medium	4	-	-	no	slightly worn	blunt breaks	no	-
CZ025	rectangular	concave	concave/convex	-	B	fine	medium	6	-	-	no	slightly worn	blunt breaks	no	-
CZ026	rectangular	concave	convex	-	B	medium	coarse	4	-	-	no	slightly worn	-	no	upper face bearing short, transversal striations on its central part (used as wrist-guard?)
CZ027	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CZ028	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CZ029	?	concave	concave	-	B	fine	coarse	4	-	-	no	worn	blunt breaks	yes	-
CZ030	rectangular	straight	convex	-	C	fine	coarse	4	-	yes	no	worn	blunt breaks	no	-

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Site no.	Site	District	Region	Country	Conservation	ID no.	Study	State	Burnt	Raw material	Length	Width	Thickness	Section
CZ031	Neratovice I, grave 17	Mělník	Bohemia	Czech Republic	Národní muzeum	43333	yes	half	yes?	Banded, fine-grained sandstone	[60.6]	48.7	6.4	concavo-convex
CZ032	Neratovice I, grave 18	Mělník	Bohemia	Czech Republic	Národní muzeum	43339	yes	1 broken edge	no	Greyish beige, fine-grained sandstone	95.7	40.1	7.2	concavo-convex
CZ033	Most VI, grave 1	Most	Bohemia	Czech Republic	Most Muzeum	336/27	yes	3 broken corners	no	Greyish beige, silicified aleuropelite (Turek 2004b)	79.2	46.7	5	concavo-convex
CZ034	Souš	Most	Bohemia	Czech Republic	Regionální muzeum v Teplicích	2446	yes	2 broken corners	no	Purple, white-mottled, silicified, Permian? psammite (Turek 2004b)	92.9	[45.3]	7.7	concavo-convex
CZ034	Souš	Most	Bohemia	Czech Republic	Regionální muzeum v Teplicích	2447	yes	complete	no	Greyish beige, calcareous, non-silicified aleuropelite (Turek 2004b)	129.5	58.8	6.2	concavo-convex
CZ034	Souš	Most	Bohemia	Czech Republic	Regionální muzeum v Teplicích	2448	yes	complete	no	Black, banded, Carboniferous? Aleuropelite (Turek 2004b)	69.1	30.4	6.2	biconvex
CZ035	Vykán	Nymburk	Bohemia	Czech Republic	Muzeum České Brod	27633	yes	1 broken edge	-	-	69.7	[30.7]	6.1	concavo-convex
CZ036	Praha 'Kobylis' VI, grave 1	Praha	Bohemia	Czech Republic	Národní muzeum	88838	yes	complete	-	Beige, banded, fine-grained sandstone	97.2	39.5	6.7	biconvex
CZ037	Praha 'Kobylis' XV, grave 11	Praha	Bohemia	Czech Republic	Muzeum hlavního města Prahy	A518450	yes	complete	no	Grey, white-veined, very fine-grained sandstone with reddish patina	51.8	22.2	6.3	biconvex
CZ038	Praha 'Kobylis' XV, grave 12	Praha	Bohemia	Czech Republic	Muzeum hlavního města Prahy	A518470	yes	2 broken corners	no	Beige sandstone	81.4	39.6	7.4	concavo-convex
CZ039	Praha 'Letná'	Praha	Bohemia	Czech Republic	Muzeum hlavního města Prahy	P3553	yes	complete, splintered face	yes	Red, fine-grained sandstone	87.2	22.2	5.4	biconvex
CZ040	Praha 'Lysolaje' III, grave 6	Praha	Bohemia	Czech Republic	Národní muzeum	15771	yes	3 broken corners	no	Beige, banded, fine-grained sandstone	83.7	42	6.7	concavo-convex
CZ040	Praha 'Lysolaje' III, grave 6	Praha	Bohemia	Czech Republic	Národní muzeum	15772	yes	reshaped fragment, 1 broken corner	yes	Black, fine-grained sandstone	[68]	[42.7]	5.9	concavo-convex
CZ041	Praha 'Lysolaje' III, grave 9	Praha	Bohemia	Czech Republic	Národní muzeum	70203	yes	1 broken edge	no	Yellowish beige, banded, fine-grained sandstone	115.7	37.9	5.9	concavo-convex

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CZ031	?	concave	straight	-	B	fine	medium	4	-	-	no	slightly worn	sharp breaks	no	-
CZ032	rectangular	concave	concave	-	B	fine	medium	4	-	yes	no	slightly worn	sharp breaks	no	-
CZ033	trapezoidal	concave	straight	-	B	medium	abrasion	4	-	yes	no	worn	blunt breaks	no	-
CZ034	rectangular	concave	convex	yes	A	medium	coarse	4	-	-	incised parallel lines	worn	blunt breaks	no	-
CZ034	rectangular	concave	convex/straight	-	B	medium	abrasion	4	-	yes	no	worn	-	no	-
CZ034	oval	convex	convex	-	G	medium	abrasion	2	-	-	no	worn	-	no	upper surface bearing a flake scar prolonged by parallel, longitudinal striations (resulting from the impact of a bow string?)
CZ035	trapezoidal	concave	convex	-	B	medium	raw/abrasion	4	-	-	-	worn	sharp breaks	no	-
CZ036	trapezoidal	straight	straight	-	D	fine	medium	4	-	-	no	slightly worn	-	no	-
CZ037	oval	convex	convex	-	G	coarse	coarse	2	-	-	no	worn	-	no	-
CZ038	trapezoidal	straight	convex	-	C	N/A	N/A	4	-	-	no	N/A	taphonomic breaks	no	-
CZ039	rectangular	straight	concave	-	D	medium	coarse	6	-	yes	no	worn	blunt & thermal breaks	no	-
CZ040	trapezoidal	concave	convex	-	B	fine	medium	4	-	-	no	slightly worn	blunt breaks	no	-
CZ040	rectangular	concave	convex	-	B	fine	coarse	4	-	-	no	very worn	blunt breaks	yes	-
CZ041	rectangular	straight	convex	-	C	medium	coarse	4	-	-	no	slightly worn	blunt breaks	no	-

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Appendix 3, continued. Detailed inventory of Bracer Ornaments from Czech Republic and Hungary.

Site no.	Site	District	Region	Country	Conservation	ID no.	Study	State	Burnt	Raw material	Length	Width	Thickness	Section
CZ042	Praha 'Lysolaje' III, grave 10	Praha	Bohemia	Czech Republic	Národní muzeum	70208	yes	2 broken corners	no	Black and green, banded, fine-grained sandstone	115.9	31	4.4	plano-convex
CZ043	Praha 'Lysolaje' III, grave 18	Praha	Bohemia	Czech Republic	Národní muzeum	418685	yes	2 broken corners	no	Grey, banded, fine-grained sandstone	83.9	41.4	4.9	convavo-convex
CZ044	Praha 'Ruzyně'	Praha	Bohemia	Czech Republic	Národní muzeum	46282	yes	complete	no	White, calcareous sandstone	83.6	23.7	4.6	biconvex
CZ045	Praha 'Velká Chuchle', grave 81	Praha	Bohemia	Czech Republic	-	-	no	complete	-	-	69.2	41.4	7.1	plano-convex
CZ045	Praha 'Velká Chuchle', grave 81	Praha	Bohemia	Czech Republic	-	-	no	fragment	-	-	[41.1]	[31.5]	5.1	convavo-convex
CZ046	Praha 'Velká Chuchle', grave 83	Praha	Bohemia	Czech Republic	-	-	no	complete	-	-	72.6	37	4.9	convavo-convex
CZ047	Praha 'Vršovice' IV, grave 3	Praha	Bohemia	Czech Republic	Národní muzeum	60341	yes	2 broken corners	no	Beige, banded, fine-grained sandstone	74	[49.8]	5.9	convavo-convex
CZ048	Praha 'Vršovice' IV, grave 4	Praha	Bohemia	Czech Republic	Národní muzeum	60343	yes	chipped edge	no	Greyish beige, banded, fine-grained sandstone	65.4	36.2	6.1	convavo-convex
CZ049	Řež, grave 6	Praha	Bohemia	Czech Republic	Národní muzeum	17886	yes	complete, recent chips	no	Beige, banded, fine-grained sandstone	74.9	36.7	5.2	convavo-convex
CZ050	Mochov, grave 30	Praha	Bohemia	Czech Republic	-	-	no	reshaped fragment	no	Red stone	[52.5]	[33.7]	?	?
CZ051	Bílina VI, grave 3	Teplice	Bohemia	Czech Republic	Regionální muzeum v Teplících	1600	yes	3 broken corners	no	Purple, white-mottled, silicified argillite? (Turek 2004b)	105.5	[46.4]	6.2	convavo-convex
CZ052	Radovesice-Bílina II, grave 116/78	Teplice	Bohemia	Czech Republic	Regionální muzeum v Teplících	36747	yes	complete, several recently broken fragments	no	Beige, banded, silty, Tertiary mudstone (Přichystal in Dvořák 1992)	136.9	46.4	7	convavo-convex
CZ053	Radovesice-Bílina III, grave 53/80-I	Teplice	Bohemia	Czech Republic	Regionální muzeum v Teplících	44524	yes	2 broken corners	no	Beige, silicified aleuropelite (Turek 2004b)	102.7	[38.5]	5.6	convavo-convex
CZ054	Radovesice-Bílina III, grave 53/80-II	Teplice	Bohemia	Czech Republic	Regionální muzeum v Teplících	44526	yes	1 broken edge	no	Grey, calcareous, non-silicified aleuropelite (Turek 2004b)	116.2	51.8	7	convavo-convex
CZ055	Dolní Věstonice II, grave 330/77	Břeclav	Moravia	Czech Republic	-	-	no	complete	-	-	129	59.1	4	convavo-convex
CZ056	Klobouky III	Břeclav	Moravia	Czech Republic	-	-	no	-	-	-	-	-	-	-
CZ057	Klobouky IV, grave 2/66	Břeclav	Moravia	Czech Republic	Mikulov Muzeum	418-5/67	yes	1 broken edge	no	Grey, banded, fine-grained sandstone	95	25.5	5.1	convavo-convex

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Site no.	General shape	Long sides	Short sides	Flanges	Sangmeister Type	Polishing (outer face)	Polishing (inner face)	Holes	New holes	Attempted holes	Ornamentation	Use wears	Origins of breaks	Reshaping	Comments
CZ042	rectangular	straight	concave	-	D	fine	coarse	4	-	yes	no	worn	blunt breaks	no	-
CZ043	rectangular	concave	concave/straight	-	B	fine	medium	4	-	yes	no	slightly worn	sharp & blunt breaks	no	-
CZ044	rectangular	convex	straight	-	G	N/A	N/A	2	-	-	no	N/A	-	no	-
CZ045	rectangular	concave	concave	-	E	-	-	4	-	-	no	-	-	-	-
CZ045	?	concave	concave	-	B	-	-	4	-	-	cup-marks	-	-	-	2 notches above the break for fastening?
CZ046	trapezoidal	straight	convex	-	C	-	-	4	-	-	no	-	-	-	-
CZ047	trapezoidal	concave	convex	-	B	fine	abrasion	4	-	-	cup-marks	slightly worn	blunt breaks	no	-
CZ048	trapezoidal	concave	concave/convex	-	B	fine	medium	4	-	-	no	slightly worn	blunt breaks	no	-
CZ049	trapezoidal	concave	convex	-	B	fine	coarse	4	-	-	no	slightly worn	-	no	-
CZ050	?	concave	straight	-	-	-	-	4	2	-	no	-	-	-	-
CZ051	rectangular	concave	concave/convex	yes	A	fine	medium	4	-	-	aligned cup-marks and incised parallel lines	worn	blunt breaks	no	-
CZ052	trapezoidal	concave	concave/straight	-	B	fine	medium	4	-	-	no	slightly worn	-	no	-
CZ053	rectangular	concave	convex	-	B	fine	coarse	4	2	yes	no	worn	blunt breaks	no	-
CZ054	rectangular	concave	straight	-	B	medium	coarse	4	-	yes	no	slightly worn	blunt breaks	no	-
CZ055	trapezoidal	concave	concave	-	B	-	-	4	-	-	no	-	-	-	-
CZ056	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CZ057	rectangular	straight	convex	-	C	fine	medium	4	-	-	no	N/A	blunt breaks	no	-



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<b>CZ058</b>	Pavlov I, grave 519/83	Břeclav	Moravia	Czech Republic	–	–	no	complete	–	–	70.1	24.1	6	plano-convex
<b>CZ059</b>	Brno 'Holásky' II, grave 13/38	Brno-město	Moravia	Czech Republic	Moravské Zemské Muzeum Brno	16360	no	complete	–	Non-calcareous, silty, Tertiary mudstone with biotite (Přichystal in Dvořák 1992)	76.4	35.3	5.5	concavo-convex
<b>CZ059</b>	Brno 'Holásky' II, grave 13/38	Brno-město	Moravia	Czech Republic	Moravské Zemské Muzeum Brno	16361	yes	half with a broken corner, several fragments	no	Grey, micaceous, non-calcareous, Tertiary sandstone (Přichystal in Dvořák 1992)	[52]	34.1	6	concavo-convex
<b>CZ060</b>	Brno 'Holásky' II, grave 35/38	Brno-město	Moravia	Czech Republic	Moravské Zemské Muzeum Brno	16409	yes	1 broken edge	no	Beige mudstone with rare glauconite (Přichystal in Dvořák 1992)	88.8	34.4	6.7	concavo-convex
<b>CZ061</b>	Brno 'Lišeň' II, grave 8	Brno-město	Moravia	Czech Republic	Muzeum města Brna	145/01–8/11	yes	broken ends	–	Greyish-beige, banded, fine-grained sandstone	[100.4]	30	5.6	plano-convex
<b>CZ062</b>	Brno 'Židenice' 4/32	Brno-město	Moravia	Czech Republic	Moravské zemské muzeum Brno	66646a	no	complete	–	–	89.6	32.3	8.7	plano-convex
<b>CZ063</b>	Blažovice II, grave 4/13	Brno-venkov	Moravia	Czech Republic	Moravské Zemské Muzeum Brno	67253	yes	2 broken corners	no	Beige, fine-grained sandstone	82.4	29.1	6.8	biconvex
<b>CZ064</b>	Blažovice II, grave 16/33	Brno-venkov	Moravia	Czech Republic	Moravské Zemské Muzeum Brno	?	no	–	–	–	–	–	–	–
<b>CZ065</b>	Blažovice II, grave 19/33	Brno-venkov	Moravia	Czech Republic	Moravské Zemské Muzeum Brno	?	no	–	–	–	–	–	–	–
<b>CZ066</b>	Ivančice, grave 1/52	Brno-venkov	Moravia	Czech Republic	–	–	no	1 broken edge	–	Black, non-calcareous, Lower Carboniferous shale (Přichystal in Dvořák 1992)	83.6	32.8	6.5	concavo-convex
<b>CZ067</b>	Ledce II, grave 1/52	Brno-venkov	Moravia	Czech Republic	–	–	no	complete	–	Yellowish grey, silicified mudstone (Přichystal in Dvořák 1992)	116.8	38.8	4.5	plano-convex
<b>CZ068</b>	Modřice, grave 1/1990	Brno-venkov	Moravia	Czech Republic	Moravské Zemské Muzeum Brno	09793–7/90	yes	1 broken edge	no	Beige, banded, fine-grained sandstone	79.3	26.8	5.5	concavo-convex
<b>CZ069</b>	Šlapanice II, grave 12/34	Brno-venkov	Moravia	Czech Republic	–	–	no	1 broken edge	–	–	94.6	36.7	5	concavo-convex
<b>CZ070</b>	Šlapanice II, grave 5/35 & 6/35	Brno-venkov	Moravia	Czech Republic	–	–	no	complete	–	–	95.5	23.4	6.6	biconvex
<b>CZ071</b>	Smolín I, grave 13/51	Brno-venkov	Moravia	Czech Republic	–	–	no	complete	–	–	122.9	44.6	7.5	concavo-convex

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Appendix 3, continued. Detailed inventory of Bracer Ornaments from Czech Republic and Hungary.

Site no.	General shape	Long sides	Short sides	Flanges	Sangmeister Type	Polishing (outer face)	Polishing (inner face)	Holes	New holes	Attempted holes	Ornamentation	Use wears	Origins of breaks	Reshaping	Comments
CZ058	rectangular	straight	concave/straight	-	D	-	-	4	-	-	no	-	-	-	-
CZ059	trapezoidal	concave	straight	-	B	-	-	4	-	-	cup-marks	-	-	-	-
CZ059	?	straight	convex	-	C	fine	fine	4	-	-	no	N/A	blunt & thermal breaks	no	-
CZ060	rectangular	concave	concave/straight	-	B	fine	medium	0	-	-	no	slightly worn	sharp breaks	no	preform
CZ061	rectangular	straight	?	-	D	N/A	N/A	6	-	-	no	N/A	taphonomic breaks	N/A	-
CZ062	trapezoidal	concave	convex	-	E	-	-	4	-	-	no	-	-	-	-
CZ063	rectangular	concave	concave/straight	-	E	fine	fine	4	-	-	no	slightly worn	blunt breaks	no	-
CZ064	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CZ065	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CZ066	trapezoidal	straight	convex	-	C	-	-	4	-	-	no	-	-	-	-
CZ067	rectangular	concave	convex	-	E	-	-	4	-	-	no	-	-	-	-
CZ068	rectangular	convex	convex	-	C	fine	medium	4	-	-	no	slightly worn	blunt breaks	no	-
CZ069	rectangular	concave	straight	-	B	-	-	4	-	-	no	-	-	-	-
CZ070	rectangular	convex	straight	-	G	-	-	2	-	-	no	-	-	-	-
CZ071	rectangular	straight	convex/straight	-	C	-	-	4	-	-	no	-	-	-	-

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Site no.	Site	District	Region	Country	Conservation	ID no.	Study	State	Burnt	Raw material	Length	Width	Thickness	Section
CZ072	Josefov I, grave 3/37	Hodonín	Moravia	Czech Republic	-	-	no	-	-	-	-	-	-	-
CZ073	Josefov III, grave 1/65	Hodonín	Moravia	Czech Republic	-	-	no	-	-	-	-	-	-	-
CZ074	Mikulčice, site I, grave 1/1924	Hodonín	Moravia	Czech Republic	-	-	no	complete	-	-	121.6	59.5	5.4	concavo-convex
CZ075	Mutěnice II, grave 2/30	Hodonín	Moravia	Czech Republic	-	-	no	complete	-	-	64.5	19.1	5.1	biconvex
CZ076	Svatobořice, grave 18	Hodonín	Moravia	Czech Republic	Moravské Zemské Muzeum Brno	67131	yes	complete	no	Yellow sandstone	91.7	30.9	6.2	concavo-convex
CZ077	Svatobořice-Mistřín 1/1902	Hodonín	Moravia	Czech Republic	-	-	no	3 broken corners and 1 broken edge	-	-	102.6	[31]	-	-
CZ078	Svatobořice-Mistřín 22/42	Hodonín	Moravia	Czech Republic	-	-	no	-	-	-	-	-	-	-
CZ079	Veselí nad Moravou	Hodonín	Moravia	Czech Republic	Masarykovo muzeum v Hodoníně	A426	yes	complete	no	Beige, fine-grained sandstone with black and bright inclusions	86.7	24.5	5.7	concavo-convex
CZ080	Zarazice	Hodonín	Moravia	Czech Republic	-	-	no	1 broken edge	-	-	90.9	[31]	6.3	concavo-convex
CZ081	Holešov, grave I	Kroměříž	Moravia	Czech Republic	-	-	no	2 broken corners	no	-	80.5	36.4	-	concavo-convex
CZ082	Holešov, grave II	Kroměříž	Moravia	Czech Republic	-	-	no	complete	no	-	104.8	42.8	-	concavo-convex
CZ083	Holešov, grave X	Kroměříž	Moravia	Czech Republic	-	-	no	1 broken edge	no	Calcareous, fine-grained sandstone (Přichystal 2000)	117	34.3	-	concavo-convex
CZ084	Hulín 1 'U Isidorka', H66	Kroměříž	Moravia	Czech Republic	Archeologické centrum Olomouc	30/2004-879-15	yes	complete	no	Beige, banded, fine-grained sandstone	101.3	43.8	6.5	concavo-convex
CZ085	Hulín 1 'U Isidorka', H85	Kroměříž	Moravia	Czech Republic	Archeologické centrum Olomouc	30/2004-895-5	yes	half	no	Beige, banded, fine-grained sandstone	[60.3]	26.3	6.7	plano-convex
CZ086	Hulín 1 'U Isidorka', H95	Kroměříž	Moravia	Czech Republic	Archeologické centrum Olomouc	30/2004-1804-8	yes	complete, fragments glued back together	no	Greyish brown, fine-grained sandstone	135.2	33.8	7.7	concavo-convex
CZ086	Hulín 1 'U Isidorka', H95	Kroměříž	Moravia	Czech Republic	Archeologické centrum Olomouc	30/2004-1804-9	yes	complete	yes	Purple, fine-grained sandstone	112	23.5	6	biconvex
CZ087	Hulín 'Pravčice' 2, H45	Kroměříž	Moravia	Czech Republic	Archeologické centrum Olomouc	04/2007-847-4	yes	complete	no	Beige, banded, fine-grained sandstone	121	41.7	6.2	concavo-convex

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Site no.	General shape	Long sides	Short sides	Flanges	Sangmeister Type	Polishing (outer face)	Polishing (inner face)	Holes	New holes	Attempted holes	Ornamentation	Use wears	Origins of breaks	Reshaping	Comments
CZ072	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CZ073	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CZ074	rectangular	concave	concave/convex	-	B	-	-	4	-	-	no	-	-	-	-
CZ075	oval	convex	convex	-	G	-	-	2	-	-	no	-	-	-	-
CZ076	trapezoidal	concave	convex/straight	-	B	N/A	N/A	4	-	-	no	N/A	-	no	-
CZ077	rectangular	convex	straight	-	-	-	-	4	-	-	no	-	-	-	-
CZ078	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CZ079	trapezoidal	concave	concave	-	B	fine	medium	4	-	-	no	worn	-	no	-
CZ080	trapezoidal	concave	convex	-	B	-	-	4	-	-	no	-	-	-	-
CZ081	rectangular	concave	convex	-	B	-	-	4	-	-	no	-	-	-	-
CZ082	rectangular	concave	straight	-	B	-	-	4	-	-	no	-	-	-	-
CZ083	rectangular	concave	concave/straight	-	B	-	-	4	-	-	no	-	-	-	-
CZ084	rectangular	concave	convex/straight	-	B	fine	coarse	4	-	-	no	slightly worn	-	no	-
CZ085	rectangular	straight	convex	-	D	fine	fine	4	-	-	no	N/A	unspecified	no	broken preform
CZ086	rectangular	straight	convex/straight	-	C	fine	fine	4	-	-	cup-marks	worn	unspecified	no	ochre-stained, black inlay in one cup-mark
CZ086	rectangular	straight	convex	-	G	medium	medium	2	-	-	cup-marks	worn	-	no	-
CZ087	rectangular	concave	convex	-	B	fine	coarse	4	-	-	no	slightly worn	-	no	ochre-stained on both faces

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Site no.	Site	District	Region	Country	Conservation	ID no.	Study	State	Burnt	Raw material	Length	Width	Thickness	Section
CZ088	Hulín 'Pravčice' 2, H46	Kroměříž	Moravia	Czech Republic	Archeologické centrum Olomouc	04/2007-848-1	yes	1 broken edge	no	Brown, banded, fine-grained sandstone	134.5	[50.4]	6.7	concavo-convex
CZ089	Hulín 'Pravčice' 2, H54	Kroměříž	Moravia	Czech Republic	Archeologické centrum Olomouc	04/2007-856-16	yes	several fragments	yes	Beige, banded, fine-grained sandstone	127.4	36.2	6.5	concavo-convex
CZ090	Hulín 'Pravčice' 2, H58	Kroměříž	Moravia	Czech Republic	Archeologické centrum Olomouc	04/2007-860-1	yes	complete	no	Beige, banded, fine-grained sandstone	129.8	40.8	7	concavo-convex
CZ091	Hulín 'Pravčice' 2, H59	Kroměříž	Moravia	Czech Republic	Archeologické centrum Olomouc	04/2007-861-3	yes	1 broken edge	no	Beige-ochred, banded, fine-grained sandstone	115.3	39.8	4.7	concavo-convex
CZ092	Hulín 'Pravčice' 2, H60	Kroměříž	Moravia	Czech Republic	Archeologické centrum Olomouc	04/2007-862-6	yes	several fragments	yes	Beige, banded, fine-grained sandstone	132.3	[43.7]	5.1	concavo-convex
CZ093	Hulín 'Pravčice' 2, H63	Kroměříž	Moravia	Czech Republic	Archeologické centrum Olomouc	04/2007-865-6	yes	1 broken edge	no	Beige, banded, fine-grained sandstone	109.7	31.5	5.4	concavo-convex
CZ094	Hulín 'Pravčice' 2, H74	Kroměříž	Moravia	Czech Republic	Archeologické centrum Olomouc	04/2007-876-1	yes	chipped edge	no	Grey, fine-grained sandstone	158.6	51	7.2	concavo-convex
CZ094	Hulín 'Pravčice' 2, H74	Kroměříž	Moravia	Czech Republic	Archeologické centrum Olomouc	04/2007-876-2	yes	complete, desquamations	no	Beige, very-fine grained sandstone	146.2	62.7	7	concavo-convex
CZ094	Hulín 'Pravčice' 2, H74	Kroměříž	Moravia	Czech Republic	Archeologické centrum Olomouc	04/2007-876-3	yes	complete	no	Greyish beige, fine-grained sandstone	132.8	48.3	7	concavo-convex
CZ094	Hulín 'Pravčice' 2, H74	Kroměříž	Moravia	Czech Republic	Archeologické centrum Olomouc	04/2007-876-4	yes	complete, splintered face	yes	Beige, banded, fine-grained sandstone	138.3	38.3	8.7	concavo-convex
CZ095	Kostelec u Holešova II, grave 13	Kroměříž	Moravia	Czech Republic	?	?	no	1 broken edge	-	-	111.4	20.5	5.6	concavo-convex
CZ096	Kostelec u Holešova III, barrow 2	Kroměříž	Moravia	Czech Republic	?	?	no	complete	-	-	138.8	50.3	5.8	concavo-convex
CZ097	Prusinovice I, grave 1	Kroměříž	Moravia	Czech Republic	-	-	no	1 broken edge	-	-	115.4	42.9	6.8	concavo-convex
CZ097	Prusinovice I, grave 1	Kroměříž	Moravia	Czech Republic	-	-	no	complete	-	-	144.5	48.3	7.1	concavo-convex
CZ098	Záhlínice, grave 48/89	Kroměříž	Moravia	Czech Republic	-	-	no	fragment	-	-	[40.6]	[23.8]	2.1	plano-convex
CZ099	Nemilany I, grave 1/40	Olomouc	Moravia	Czech Republic	-	-	no	-	-	-	-	-	-	-
CZ100	Opatovice, grave 1	Přerov	Moravia	Czech Republic	Archeologické centrum Olomouc	-	yes	1 broken edge	no	Brownish beige, medium-grained sandstone	107.3	32.8	7	concavo-convex

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Site no.	General shape	Long sides	Short sides	Flanges	Sangmeister Type	Polishing (outer face)	Polishing (inner face)	Holes	New holes	Attempted holes	Ornamentation	Use wears	Origins of breaks	Reshaping	Comments
CZ088	trapezoidal	concave	convex/ straight	-	B	fine	fine	4	-	yes	no	slightly worn	sharp breaks	no	-
CZ089	rectangular	straight	convex	-	C	fine	fine	4	-	yes	no	slightly worn	thermal breaks	no	-
CZ090	rectangular	convex	convex	-	C	fine	medium	4	-	yes	no	worn	-	no	-
CZ091	rectangular	straight	convex	-	C	fine	coarse	4	-	yes	cup-marks	worn	blunt breaks	no	-
CZ092	rectangular	straight	convex	-	C	N/A	N/A	4	-	-	no	N/A	thermal breaks	no	-
CZ093	rectangular	straight	convex	-	C	fine	fine	4	-	-	no	slightly worn	sharp breaks	no	-
CZ094	rectangular	concave	concave	-	B	fine	medium	4	-	-	no	slightly worn	blunt breaks	no	-
CZ094	rectangular	concave	convex	-	B	fine	medium	4	-	-	no	slightly worn	-	no	-
CZ094	rectangular	straight	convex	-	C	fine	medium	4	-	-	no	slightly worn	-	no	-
CZ094	rectangular	straight	convex	-	C	fine	medium	4	-	-	cup-marks	worn	thermal breaks	no	-
CZ095	rectangular	straight	convex	-	C	-	-	2	-	-	no	-	-	-	-
CZ096	trapezoidal	concave	convex	-	B	-	-	4	-	-	no	-	-	-	-
CZ097	rectangular	concave	concave/ straight	-	B	-	-	4	1	-	no	-	-	-	-
CZ097	rectangular	concave	concave/ straight	-	B	-	-	4	-	-	no	-	-	-	-
CZ098	?	?	straight	-	D	-	-	4	-	-	no	-	-	-	-
CZ099	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CZ100	rectangular	straight	concave	-	C	fine	fine	4	-	-	no	slightly worn	sharp breaks	no	-

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Appendix 3, continued. Detailed inventory of Bracer Ornaments from Czech Republic and Hungary.

Site no.	Site	District	Region	Country	Conservation	ID no.	Study	State	Burnt	Raw material	Length	Width	Thickness	Section
CZ101	Předmostí, grave (?) 1	Přerov	Moravia	Czech Republic	Přerov Muzeum	1601-63-11	yes	complete	no	Beige, fine-grained sandstone	66.8	19.5	6.6	biconvex
CZ101	Předmostí, grave (?) 1	Přerov	Moravia	Czech Republic	Přerov Muzeum	1601-63-12	yes	1 broken edge	no	Black, very fine-grained stone	116.8	25.6	7.7	biconvex
CZ102	Předmostí, grave (?) 2	Přerov	Moravia	Czech Republic	Přerov Muzeum	1601-63-10	yes	3 broken corners	no	Red, banded, fine-grained sandstone	107.2	27.5	6.2	plano-convex
CZ102	Předmostí, grave (?) 2	Přerov	Moravia	Czech Republic	Přerov Muzeum	1601-63-9	yes	1 broken edge	no	Beige, very-fine grained sandstone	142.5	34	8.3	biconvex
CZ103	Němčice nad Hanou, grave 18	Přerov	Moravia	Czech Republic	Moravské Zemské Muzeum Brno	66571	yes	complete	no	Beige, fine-grained sandstone	79.9	25.2	5.4	concavo-convex
CZ103	Němčice nad Hanou, grave 18	Přerov	Moravia	Czech Republic	Moravské Zemské Muzeum Brno	66572	yes	1 broken edge	no	Black, white-mottled, banded, fine-grained sandstone	74	30	3.7	concavo-convex
CZ104	Němčice nad Hanou, grave 33	Přerov	Moravia	Czech Republic	Moravské Zemské Muzeum Brno	66573	yes	complete	no	Grey, calcareous sandstone	79.6	32.1	7.1	concavo-convex
CZ104	Němčice nad Hanou, grave 33	Přerov	Moravia	Czech Republic	Moravské Zemské Muzeum Brno	66574	yes	complete	no	Greyish green, fine-grained stone	64.2	23.3	6.4	plano-convex
CZ105	Turovice 'Kopice'	Přerov	Moravia	Czech Republic	-	-	no	3 broken corners	-	-	88.2	[32.1]	5.3	concavo-convex
CZ106	Brodek u Proštejova, K522/H1	Prostějov	Moravia	Czech Republic	ÚAPP Brno/Prostějov	-	yes	complete	no	Beige, fine-grained sandstone	124.2	29.9	5.8	concavo-convex
CZ106	Brodek u Proštejova, K522/H1	Prostějov	Moravia	Czech Republic	ÚAPP Brno/Prostějov	-	yes	fragments	yes	Yellowish beige, banded sandstone	[126.5]	[34.4]	7.2	concavo-convex
CZ106	Brodek u Proštejova, K522/H1	Prostějov	Moravia	Czech Republic	ÚAPP Brno/Prostějov	-	yes	fragments	yes	Greyish beige, fine-grained sandstone	[62.6]	[10.3]	4	concavo-convex
CZ107	Brodek u Proštejova, K523/H2	Prostějov	Moravia	Czech Republic	ÚAPP Brno/Prostějov	-	yes	complete	no	Greyish yellow, fine-grained sandstone	120.5	33.9	6.4	concavo-convex
CZ108	Hrubčice	Prostějov	Moravia	Czech Republic	Moravské Zemské Muzeum Brno	66950	yes	complete, desquamations	no	Black, banded, fine-grained sandstone	115.4	38.5	5.1	concavo-convex
CZ109	Ondratice I, grave 1/1900	Prostějov	Moravia	Czech Republic	Moravské Zemské Muzeum Brno	66967	yes	half, 1 broken corner	no	Reddish, banded, fine-grained sandstone	[45.7]	34.8	6.7	concavo-convex
CZ110	Prostějov IV, grave 1/45	Prostějov	Moravia	Czech Republic	Muzeum a galerie v Prostějově	007405/1	yes	complete, several fragments	-	Beige, banded, very fine-grained sandstone	102.4	36	8	concavo-convex
CZ111	Zěšov	Prostějov	Moravia	Czech Republic	Muzeum a galerie v Prostějově	-	yes	half	-	Beige, very-fine grained sandstone	[46.5]	25.6	6.3	biconvex

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Site no.	General shape	Long sides	Short sides	Flanges	Sangmeister Type	Polishing (outer face)	Polishing (inner face)	Holes	New holes	Attempted holes	Ornamentation	Use wears	Origins of breaks	Reshaping	Comments
CZ101	rectangular	convex	convex	-	G	fine	medium	2	-	-	no	worn	-	no	-
CZ101	rectangular	convex	concave	-	G	fine	coarse	2	-	-	no	slightly worn	blunt breaks	no	-
CZ102	trapezoidal	concave	convex	-	E	fine	fine	4	-	-	cup-marks	very worn	sharp & blunt breaks	no	-
CZ102	rectangular	convex	convex	-	D	medium	coarse	6	-	-	no	worn	sharp breaks	no	-
CZ103	trapezoidal	concave	convex	-	B	fine	fine	4	-	-	no	slightly worn	-	no	-
CZ103	rectangular	concave	concave	-	B	medium	abrasion	4	-	-	no	worn	blunt breaks	no	-
CZ104	rectangular	concave	convex/straight	-	B	N/A	N/A	4	-	-	no	N/A	-	no	-
CZ104	rectangular	convex	straight	-	G	fine	medium	2	-	-	no	worn	-	no	-
CZ105	trapezoidal	concave	convex	-	B	-	-	4	-	-	no	-	-	-	-
CZ106	rectangular	convex	convex/straight	-	C	fine	medium	4	-	-	no	N/A	-	no	-
CZ106	trapezoidal	straight	concave	-	C	N/A	N/A	4	-	-	no	N/A	thermal breaks	no	-
CZ106	rectangular	straight	convex	-	C	N/A	N/A	?	?	?	?	N/A	thermal breaks	no	-
CZ107	rectangular	convex/straight	concave/convex	-	C	fine	medium	4	-	-	no	N/A	-	no	-
CZ108	rectangular	concave	convex	-	B	fine	medium	4	-	-	no	slightly worn	-	no	-
CZ109	rectangular	straight	convex	-	C	medium	medium	4	1	-	no	worn	blunt breaks	no	-
CZ110	rectangular	straight	convex	-	C	fine	fine	4	-	-	no	worn	-	no	-
CZ111	?	concave	convex	-	F	fine	fine	2	-	-	no	N/A	blunt breaks	no	-



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Site no.	Site	District	Region	Country	Conservation	ID no.	Study	State	Burnt	Raw material	Length	Width	Thickness	Section
CZ112	Lhánice, grave 7/50	Třebíč	Moravia	Czech Republic	Národní muzeum	90030	yes	2 broken corners, splintered faces	yes	Fine-grained sandstone	118.7	[40.6]	6	concavo-convex
CZ113	Lhánice, grave 8/50	Třebíč	Moravia	Czech Republic	Národní muzeum	90032	yes	2 broken corners	no	Grey, calcareous sandstone	77	25.4	6	biconvex
CZ114	Dolní Sukolom, grave 8/45	Uničov	Moravia	Czech Republic	-	-	no	1 broken edge	-	-	87.1	[34.3]	-	-
CZ115	Brankovice, grave 2	Vyškov	Moravia	Czech Republic	Moravské Zemské Muzeum Brno	without no.	yes	1 broken corner, 1 broken edge, several fragments, splintered faces	yes	Banded, fine-grained sandstone	111.3	38.3	8.5	concavo-convex
CZ116	Hodějice	Vyškov	Moravia	Czech Republic	Moravské Zemské Muzeum Brno	66433	yes	1 broken edge	no	Greyish beige, very fine grained sandstone	108.9	38.6	6	plano-convex
CZ117	Hoštice I, grave 843/02	Vyškov	Moravia	Czech Republic	Muzeum Vyškovska	A84592	yes	altered fragment	no	Beige, strongly calcareous, fine-grained sandstone (Přichystal/Všianský 2012)	[68.5]	[26.9]	6.1	plano-convex
CZ118	Hoštice I, grave 862/02	Vyškov	Moravia	Czech Republic	Muzeum Vyškovska	A84644	yes	complete	no	Beige, banded, calcareous, fine-grained sandstone with muscovite (Přichystal/Všianský 2012)	83	34.2	5.2	concavo-convex
CZ119	Hoštice I, grave 884/02	Vyškov	Moravia	Czech Republic	Muzeum Vyškovska	A84767	yes	2 broken corners	no	Beige, banded, non-calcareous, fine-grained sandstone with muscovite (Přichystal/Všianský 2012)	78.8	[31.2]	7	concavo-convex
CZ120	Hoštice I, grave 885/02	Vyškov	Moravia	Czech Republic	Muzeum Vyškovska	A84769	yes	complete, 2 fragments	no	Marlstone (Přichystal/Všianský 2012)	92	36.4	5.8	concavo-convex
CZ121	Hoštice I, grave 911/02	Vyškov	Moravia	Czech Republic	Muzeum Vyškovska	A84790	yes	chipped edge, 2 fragments	no	Beige, non-calcareous claystone (Přichystal/Všianský 2012)	112.2	38.4	6.2	concavo-convex
CZ122	Hoštice I, grave 915/02	Vyškov	Moravia	Czech Republic	Muzeum Vyškovska	A84792	yes	complete, 2 fragments	no	Beige, banded, silty claystone (Přichystal/Všianský 2012)	110.6	56	6	concavo-convex
CZ123	Hoštice I, grave 917/02	Vyškov	Moravia	Czech Republic	Muzeum Vyškovska	A84810	yes	altered fragment	no	Beige, calcareous quartz sandstone (Přichystal/Všianský 2012)	74.9	28.4	7.4	plano-convex
CZ124	Hoštice I, grave 939/02	Vyškov	Moravia	Czech Republic	Muzeum Vyškovska	A84876	yes	2 broken corners	no	Black Cushman silty shale with schlieren of siltstone (Přichystal/Všianský 2012)	99.8	38	6.2	concavo-convex

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Appendix 3, continued. Detailed inventory of Bracer Ornaments from Czech Republic and Hungary.

Site no.	General shape	Long sides	Short sides	Flanges	Sangmeister Type	Polishing (outer face)	Polishing (inner face)	Holes	New holes	Attempted holes	Ornamentation	Use wears	Origins of breaks	Reshaping	Comments
CZ112	trapezoidal	concave	concave	-	B	fine	coarse	6	-	-	no	slightly worn	blunt and thermal breaks	no	-
CZ113	trapezoidal	convex	convex	-	E	N/A	N/A	4	-	-	no	N/A	taphonomic breaks	no	-
CZ114	trapezoidal	concave	convex	-	-	-	-	4	-	-	no	-	-	-	-
CZ115	trapezoidal	convex	concave	-	C	medium	medium	4	-	yes	no	slightly worn	thermal breaks	no	-
CZ116	rectangular	straight	concave	-	C	fine	medium	4	-	-	no	worn	sharp breaks	no	-
CZ117	?	?	?	-	D/E	N/A	N/A	4	N/A	-	N/A	N/A	taphonomic breaks	N/A	-
CZ118	rectangular	concave	concave	-	B	fine	abrasion	4	-	-	cup-marks	N/A	-	no	-
CZ119	trapezoidal	concave	convex	-	B	N/A	N/A	4	-	-	no	N/A	sharp breaks	no	-
CZ120	rectangular	concave	convex	-	B	N/A	N/A	4	-	-	no	N/A	-	no	-
CZ121	rectangular	straight	concave	-	C	fine	medium	4	-	-	no	slightly worn	blunt breaks	no	-
CZ122	trapezoidal	concave	convex	-	B	fine	medium	6	-	yes	no	slightly worn	blunt breaks	no	-
CZ123	trapezoidal	convex	convex	-	G	N/A	N/A	3	-	-	no	N/A	taphonomic breaks	no	-
CZ124	trapezoidal	concave	convex	-	B	medium	medium	4	-	-	no	very worn	sharp and blunt breaks	no	-

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Site no.	Site	District	Region	Country	Conservation	ID no.	Study	State	Burnt	Raw material	Length	Width	Thickness	Section
CZ125	Hoštice I, grave 949/02	Vyškov	Moravia	Czech Republic	Muzeum Vyškovska	A84949	yes	3 broken corners	no	Beige, fine-grained sandstone (Přichystal/Všianský 2012)	84.9	[25.8]	6.4	concavo-convex
CZ126	Hoštice IV, grave 841/02	Vyškov	Moravia	Czech Republic	Muzeum Vyškovska	A34469	yes	complete	no	Grey Cullman siltstone pebble (Přichystal/Všianský 2012)	37.8	12.7	3.5	biconvex
CZ127	Ivanovice na Hané, grave 812/02	Vyškov	Moravia	Czech Republic	Muzeum Vyškovska	A84644	yes	complete	no	Beige, fine-grained sandstone	83	34.2	5.2	concavo-convex
CZ128	Letonice, grave 1	Vyškov	Moravia	Czech Republic	Moravské Zemské Muzeum Brno	66298	yes	3 broken corners, desquamations	yes	Greyish brown, fine-grained sandstone	93.5	36.8	7.1	concavo-convex
CZ129	Luleč	Vyškov	Moravia	Czech Republic	Muzeum Vyškovska	A12706	yes	complete, 2 fragments	no	Black siltstone	60.9	28.8	4.8	concavo-convex
CZ130	Marefy, grave 6	Vyškov	Moravia	Czech Republic	–	–	no	1 broken edge	–	–	86	31	6.9	concavo-convex
CZ131	Nesovice	Vyškov	Moravia	Czech Republic	Moravské Zemské Muzeum Brno	without no.	yes	one missing end, several fragments	no	Yellow, fine-grained sandstone	[81.3]	21.6	6.9	concavo-convex
CZ132	Pustiměř III	Vyškov	Moravia	Czech Republic	Muzeum Vyškovska	A6541	yes	chipped edge	no	Beige, fine-grained sandstone	70.9	21	5.5	concavo-convex
CZ133	Rousínov-Rousínovec II/18/1985	Vyškov	Moravia	Czech Republic	–	–	no	complete	–	–	111.9	32	5.2	concavo-convex
CZ134	Slavkov u Brna III, grave 8/04	Vyškov	Moravia	Czech Republic	Moravské Zemské Muzeum Brno	66903	yes	complete	no	Yellow sandstone	87.3	33.9	8.8	biconvex
CZ135	Béhařovice I, grave 1/1899	Znojmo	Moravia	Czech Republic	?	?	no	1 broken edge	–	–	60	26	5.1	biconvex
CZ136	Bohutice II, grave 1/50	Znojmo	Moravia	Czech Republic	Národní muzeum	83042	yes	1 broken edge	yes?	Red, fine-grained sandstone	123.8	[40.7]	5.7	concavo-convex
CZ136	Bohutice II, grave 1/50	Znojmo	Moravia	Czech Republic	Národní muzeum	83043	yes	reshaped fragment, splintered face	yes	Red, banded, fine-grained sandstone	[68]	[43.9]	6.6	concavo-convex
CZ137	Dolní Dubňany, grave 5/30	Znojmo	Moravia	Czech Republic	Moravské Zemské Muzeum Brno	Pa 115/35	yes	1 broken edge	no	Greyish beige, banded, fine-grained sandstone	85	25.8	5.5	plano-convex
CZ138	Hodonice-Tasovice	Znojmo	Moravia	Czech Republic	Jihomoravské muzeum ve Znojmě	A1400	yes	1 broken edge	yes	Banded, fine-grained sandstone	100.5	[46.1]	6.5	concavo-convex
CZ139	Ježany-Maršovice, grave 67	Znojmo	Moravia	Czech Republic	?	?	no	2 broken corners and 1 broken edge	yes?	Greenish yellow, non calcareous, Tertiary mudstone (Přichystal 2000)	128	[36.4]	5.7	biconvex

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CZ125	rectangular	concave	straight	-	B	fine	fine	4	-	-	no	slightly worn	blunt breaks	no	-
CZ126	oval	convex	convex	-	G	none	none	2	-	-	no	slightly worn	-	no	-
CZ127	rectangular	concave	convex	-	B	N/A	N/A	4	-	-	cup-marks	N/A	-	no	greenish resinous inlay filling a cup-mark, remains of a binding thread conserved in one hole
CZ128	rectangular	concave	convex/straight	-	B	fine	coarse	4	-	-	no	worn	blunt breaks	no	-
CZ129	trapezoidal	concave	convex	-	B	fine	coarse	4	-	-	incised parallel lines	worn	-	no	-
CZ130	rectangular	concave	concave/convex	-	B	-	-	4	-	-	no	-	-	-	-
CZ131	rectangular	straight	straight	-	C	fine	N/A	2	-	-	no	N/A	unspecified	no	-
CZ132	rectangular	concave	convex	-	B	fine	medium	3	-	-	cup-marks	slightly worn	blunt breaks	no	-
CZ133	rectangular	convex	convex/straight	-	C	-	-	4	-	-	no	-	-	-	-
CZ134	trapezoidal	straight	convex	-	-	fine	N/A	N/A	-	yes	no	N/A	-	no	preform
CZ135	trapezoidal	convex	concave	-	E	-	-	4	-	-	no	-	-	-	-
CZ136	rectangular	straight	concave	-	C	fine	medium	4	-	-	aligned cup-marks	worn	sharp & blunt breaks	no	-
CZ137	rectangular	straight	convex	-	C	fine	fine	4	3	-	no	N/A	blunt & thermal breaks	yes	-
CZ138	rectangular	straight	straight	-	D	fine	medium	4	-	-	no	slightly worn	blunt breaks	no	-
CZ139	trapezoidal	concave	convex	-	B	fine	abrasion	4	-	-	no	slightly worn	blunt breaks	no	-
CZ139	trapezoidal	concave	concave	-	E	-	-	6	-	-	no	-	-	-	-

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CZ140	Lechovice, grave 5	Znojmo	Moravia	Czech Republic	Jihomoravské muzeum ve Znojmě	511-28/58	yes	complete, splintered faces	yes	Fine-grained sandstone	92.4	30.3	5	biconvex
CZ141	Střelice, grave 8/1926	Znojmo	Moravia	Czech Republic	-	-	no	complete	-	-	114.5	49.9	6.1	concavo-convex
CZ142	Tešetice, grave 4	Znojmo	Moravia	Czech Republic	-	-	no	complete	-	-	104.1	34.2	6.9	concavo-convex
CZ143	Tešetice-Kyjovice, grave 27	Znojmo	Moravia	Czech Republic	-	-	no	complete	-	-	-	-	-	concavo-convex
CZ143	Tešetice-Kyjovice, grave 27	Znojmo	Moravia	Czech Republic	-	-	no	1 broken edge	-	-	-	-	-	concavo-convex
CZ144	Tvořihráz, grave 2/91	Znojmo	Moravia	Czech Republic	-	-	no	1 broken edge	-	-	121	28.2	8.4	biconvex
CZ145	Únanov II, grave 1/37	Znojmo	Moravia	Czech Republic	-	-	no	-	-	-	-	-	-	-
CZ146	Vedrovice	Znojmo	Moravia	Czech Republic	-	-	no	1 broken edge	-	-	73.5	29.5	4.9	concavo-convex
CZ147	Věmyslice I, grave 2/47	Znojmo	Moravia	Czech Republic	Národní muzeum	83039	yes	2 broken corners	no	Beige, medium-grained sandstone with black inclusions	130	37.7	7.9	biconvex
H001	Budapest-Békásmegyér, grave 128	Budapest	Hungary	Hungary	-	-	no	3 broken corners	-	-	[64]	22	3	concavo-convex
H002	Budapest-Békásmegyér, grave 432/a	Budapest	Hungary	Hungary	-	-	no	2 broken corners	-	-	73	30	3.6	plano-convex
H003	Budapest-Békásmegyér, grave 471	Budapest	Hungary	Hungary	-	-	no	1 broken edge	-	-	120	52	4	concavo-convex
H004	Budapest-Csepel 'Rákóczi Ferenc street', grave 1	Budapest	Hungary	Hungary	-	-	no	complete	-	-	107	45	5	concavo-convex
H005	Budapest-Csepel, Waste Water Treatment Plant	Budapest	Hungary	Hungary	-	-	no	-	-	-	-	-	-	-
H006	Budakalász 'Luppacsárdá', grave 14	Szentendre	Pest	Hungary	Ferenczy Múzeum	-	no	1 broken edge	yes	-	97	38	4	concavo-convex
H007	Budakalász 'Luppacsárdá', grave 106	Szentendre	Pest	Hungary	Ferenczy Múzeum	-	no	2 broken corners	no	-	76	32	7	concavo-convex
H008	Budakalász 'Luppacsárdá', grave 107	Szentendre	Pest	Hungary	Ferenczy Múzeum	-	no	1 broken edge	no	-	84	36	3	concavo-convex
H009	Budakalász 'Luppacsárdá', grave 157	Szentendre	Pest	Hungary	Ferenczy Múzeum	-	no	complete	-	-	93	32	5	plano-convex
H010	Budakalász 'Luppacsárdá', grave 171	Szentendre	Pest	Hungary	Ferenczy Múzeum	-	no	half	yes	-	[66]	33	6	concavo-convex

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Appendix 3, continued. Detailed inventory of Bracer Ornaments from Czech Republic and Hungary.

Site no.	General shape	Long sides	Short sides	Flanges	Sangmeister Type	Polishing (outer face)	Polishing (inner face)	Holes	New holes	Attempted holes	Ornamentation	Use wears	Origins of breaks	Reshaping	Comments
CZ140	rectangular	straight	convex	-	D	fine	fine	4	-	-	no	slightly worn	thermal	no	-
CZ141	trapezoidal	concave	concave/straight	-	B	-	-	4	-	-	no	-	-	-	-
CZ142	rectangular	convex	convex	-	C	-	-	4	-	-	no	-	-	-	-
CZ143	rectangular	straight	convex	-	C	-	-	4	-	-	no	-	-	-	-
CZ143	rectangular	straight	convex	-	C	-	-	4	-	-	no	-	-	-	-
CZ144	trapezoidal	convex	straight	-	D	-	-	6	-	-	no	-	-	-	-
CZ145	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CZ146	rectangular	straight	convex	-	C	-	-	4	-	-	no	-	-	-	-
CZ147	rectangular	convex	straight	-	E	fine	fine	4	-	yes	no	N/A	sharp and blunt breaks	yes	-
H001	rectangular	straight	convex	-	C	-	-	4	-	-	no	-	-	-	-
H002	trapezoidal	straight	convex	-	D	-	-	4	1	-	no	-	-	-	-
H003	trapezoidal	concave	straight	-	B	-	-	4	-	-	no	-	-	-	-
H004	trapezoidal	concave	convex	-	B	-	-	4	-	-	no	-	-	-	-
H005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
H006	rectangular	concave	concave	-	B	-	-	4	-	-	no	-	-	-	-
H007	rectangular	straight	convex	-	C	-	-	4	1	-	no	-	-	-	-
H008	trapezoidal	concave	convex	-	B	-	-	4	-	-	no	-	-	-	-
H009	rectangular	concave	convex	-	E	-	-	4	-	-	cup-marks	-	-	-	-
H010	rectangular	straight	convex	-	C	-	-	4	-	-	no	-	-	-	-

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Appendix 3, continued. Detailed inventory of Bracer Ornaments from Czech Republic and Hungary.

Site no.	Site	District	Region	Country	Conservation	ID no.	Study	State	Burnt	Raw material	Length	Width	Thickness	Section
H011	Budakalász 'Luppacsárdá', grave 185	Szentendre	Pest	Hungary	Ferenczy Múzeum	-	no	1 broken edge	no	-	93	42	3	concavo-convex
H012	Budakalász 'Luppacsárdá', grave 196	Szentendre	Pest	Hungary	Ferenczy Múzeum	-	no	complete	no	-	81	35	3	concavo-convex
H013	Budakalász 'Luppacsárdá', grave 203	Szentendre	Pest	Hungary	Ferenczy Múzeum	-	no	fragment	yes	-	[34]	[31]	3	plano-convex
H014	Budakalász 'Luppacsárdá', grave 278	Szentendre	Pest	Hungary	Ferenczy Múzeum	-	no	1 broken edge	no	-	81	35	4	concavo-convex
H015	Budakalász 'Luppacsárdá', grave 285	Szentendre	Pest	Hungary	Ferenczy Múzeum	-	no	3 broken corners	no	-	98	37	4	concavo-convex
H016	Budakalász 'Luppacsárdá', grave 347	Szentendre	Pest	Hungary	Ferenczy Múzeum	-	no	2 broken corners	no	-	79	38	6	concavo-convex
H017	Budakalász 'Luppacsárdá', grave 467	Szentendre	Pest	Hungary	Ferenczy Múzeum	-	no	complete	no	-	98	27	5	plano-convex
H018	Budakalász 'Luppacsárdá', grave 484	Szentendre	Pest	Hungary	Ferenczy Múzeum	-	no	several fragments	no	-	[75]	33	5	concavo-convex
H019	Budakalász 'Luppacsárdá', grave 530	Szentendre	Pest	Hungary	Ferenczy Múzeum	-	no	3 broken corners	yes	-	78	[34]	3	concavo-convex
H020	Budakalász 'Luppacsárdá', grave 551	Szentendre	Pest	Hungary	Ferenczy Múzeum	-	no	2 broken corners	no	-	90	38	4	concavo-convex
H021	Budakalász 'Luppacsárdá', grave 614	Szentendre	Pest	Hungary	Ferenczy Múzeum	-	no	1 broken edge	no	-	54	38	4	concavo-convex
H022	Budakalász 'Luppacsárdá', grave 616	Szentendre	Pest	Hungary	Ferenczy Múzeum	-	no	half	no	-	67	39	5	concavo-convex
H023	Budakalász 'Luppacsárdá', grave 847	Szentendre	Pest	Hungary	Ferenczy Múzeum	-	no	complete	no	-	94	34	3	concavo-convex
H024	Budakalász 'Luppacsárdá', grave 884	Szentendre	Pest	Hungary	Ferenczy Múzeum	-	no	1 broken edge	no	-	65	26	4	concavo-convex
H025	Budakalász 'Luppacsárdá', grave 901	Szentendre	Pest	Hungary	Ferenczy Múzeum	-	no	1 broken edge	no	-	100	39	6	plano-convex
H026	Budakalász 'Luppacsárdá', grave 925	Szentendre	Pest	Hungary	Ferenczy Múzeum	-	no	half	yes	-	[64]	39	6	concavo-convex
H027	Budakalász 'Luppacsárdá', grave 936	Szentendre	Pest	Hungary	Ferenczy Múzeum	-	no	half	no	-	[68]	29	6	plano-convex
H028	Budakalász 'Luppacsárdá', grave 945	Szentendre	Pest	Hungary	Ferenczy Múzeum	-	no	3 fragments	?	-	107	40	5	plano-convex
H029	Budakalász 'Luppacsárdá', grave 979	Szentendre	Pest	Hungary	Ferenczy Múzeum	-	no	complete	no	-	75	36	3	concavo-convex
H030	Budakalász 'Luppacsárdá', grave 990	Szentendre	Pest	Hungary	Ferenczy Múzeum	-	no	2 broken corners	no	-	90	36	4	concavo-convex
H031	Budakalász 'Luppacsárdá', grave 1024	Szentendre	Pest	Hungary	Ferenczy Múzeum	-	no	several fragments	yes	-	119	42	6	concavo-convex

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Appendix 3, continued. Detailed inventory of Bracer Ornaments from Czech Republic and Hungary.

Site no.	General shape	Long sides	Short sides	Flanges	Sangmeister Type	Polishing (outer face)	Polishing (inner face)	Holes	New holes	Attempted holes	Ornamentation	Use wears	Origins of breaks	Reshaping	Comments
H011	trapezoidal	concave	straight	-	B	-	-	4	-	-	cup-marks	-	-	-	-
H012	rectangular	concave	convex	-	B	-	-	4	-	-	no	-	-	-	-
H013	rectangular	straight	straight	-	G	-	-	2	-	-	no	-	-	-	-
H014	rectangular	concave	straight	-	B	-	-	4	-	-	cup-marks	-	-	-	-
H015	trapezoidal	concave	convex	-	B	-	-	4	-	-	no	-	-	-	-
H016	rectangular	concave	convex	-	B	-	-	4	-	-	no	-	-	-	-
H017	trapezoidal	straight	straight	-	D	-	-	4	-	-	no	-	-	-	-
H018	rectangular	concave	straight	-	B	-	-	4	-	-	no	-	-	-	-
H019	rectangular	concave	concave	-	B	-	-	6	-	-	no	-	-	-	-
H020	trapezoidal	concave	straight	-	B	-	-	4	-	-	no	-	-	-	-
H021	rectangular	concave	straight	-	B	-	-	4	2	-	no	-	-	yes	-
H022	rectangular	straight	straight	-	C	-	-	4	-	-	no	-	-	-	-
H023	rectangular	straight	convex	-	C	-	-	4	-	-	no	-	-	-	-
H024	trapezoidal	straight	convex	-	C	-	-	6	-	-	no	-	-	-	-
H025	trapezoidal	straight	convex	-	D	-	-	4	-	-	no	-	-	-	-
H026	rectangular	concave	concave	-	B	-	-	4	-	-	no	-	-	-	-
H027	rectangular	concave	convex	-	E	-	-	4	-	-	cup-marks	-	-	-	-
H028	rectangular	concave	straight	-	E	-	-	4	-	-	no	-	-	-	-
H029	rectangular	concave	concave	-	B	-	-	4	-	-	cup-marks	-	-	-	-
H030	trapezoidal	concave	straight	-	B	-	-	4	-	-	no	-	-	-	-
H031	rectangular	concave	straight	-	B	-	-	4	-	-	no	-	-	-	-



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Site no.	Site	District	Region	Country	Conservation	ID no.	Study	State	Burnt	Raw material	Length	Width	Thickness	Section
H032	Budakalász 'Luppacsárdá', grave 1082	Szentendre	Pest	Hungary	Ferenczy Múzeum	-	no	2 broken corners	no	-	91	39	3	concavo-convex
H033	Budakalász 'Luppacsárdá', grave 1118	Szentendre	Pest	Hungary	Ferenczy Múzeum	-	no	complete	yes	-	73	33	5	concavo-convex
H033	Budakalász 'Luppacsárdá', grave 1118	Szentendre	Pest	Hungary	Ferenczy Múzeum	-	no	2 broken corners	yes	-	80	[38]	3	concavo-convex
H034	Budakalász 'Luppacsárdá', grave 1259	Szentendre	Pest	Hungary	Ferenczy Múzeum	-	no	1 broken edge	no	-	46	37	4	concavo-convex
H035	Budakalász 'Luppacsárdá', grave 1265	Szentendre	Pest	Hungary	Ferenczy Múzeum	-	no	1 broken edge	no	-	73	23	3	concavo-convex
H035	Budakalász 'Luppacsárdá', grave 1265	Szentendre	Pest	Hungary	Ferenczy Múzeum	-	no	2 fragments	yes	-	[51]	[24]	3	plano-convex
H036	Budakalász 'Luppacsárdá', grave 1274	Szentendre	Pest	Hungary	Ferenczy Múzeum	-	no	fragment	yes	-	[39]	24	3	concavo-convex
H037	Budakalász 'Luppacsárdá', grave 1288	Szentendre	Pest	Hungary	Ferenczy Múzeum	-	no	half	no	-	[57]	47	5	concavo-convex
H038	Budakalász 'Tangazdaság', grave 1	2	Pest	Hungary	-	-	no	complete	-	-	76	32	-	-
H039	Szigetszentmiklós 'Felső Úrge-hegyi dűlő', grave 40	Szigetszentmiklós	Pest	Hungary	Ferenczy Múzeum	2009.11.40.3	yes	complete	no	Beige, fine-grained sandstone	117.3	28.8	8.4	biconvex
H040	Szigetszentmiklós 'Felső Úrge-hegyi dűlő', grave 49	Szigetszentmiklós	Pest	Hungary	Ferenczy Múzeum	2009.11.49.3	yes	1 broken edge	no	Beige, banded, fine-grained sandstone	132.9	[53.4]	6	concavo-convex
H041	Szigetszentmiklós 'Felső Úrge-hegyi dűlő', grave 76-77	Szigetszentmiklós	Pest	Hungary	Ferenczy Múzeum	2009.11.76.14	yes	complete, splintered face	yes	Beige, banded, fine-grained sandstone	132.5	34.2	5.9	concavo-convex
H041	Szigetszentmiklós 'Felső Úrge-hegyi dűlő', grave 76-77	Szigetszentmiklós	Pest	Hungary	Ferenczy Múzeum	2009.11.77.4	yes	2 broken corners	yes	Beige, micaceous, fine-grained sandstone	147.6	43.5	6.4	concavo-convex
H042	Szigetszentmiklós 'Felső Úrge-hegyi dűlő', grave 84	Szigetszentmiklós	Pest	Hungary	Ferenczy Múzeum	2009.11.84.2	yes	1 broken edge	no	Beige, banded, fine-grained sandstone	115.6	45.7	7	concavo-convex
H043	Szigetszentmiklós 'Felső Úrge-hegyi dűlő', grave 107	Szigetszentmiklós	Pest	Hungary	Ferenczy Múzeum	2009.11.107.7	yes	4 broken corners	no	Grey, banded, fine-grained sandstone	110.1	[49.5]	5	concavo-convex
H044	Szigetszentmiklós 'Felső Úrge-hegyi dűlő', grave 128	Szigetszentmiklós	Pest	Hungary	Ferenczy Múzeum	2009.11.128.3	yes	complete	no	Grey, very fine-grained sandstone	117.7	43.2	6	concavo-convex
H045	Szigetszentmiklós 'Felső Úrge-hegyi dűlő', grave 146	Szigetszentmiklós	Pest	Hungary	Ferenczy Múzeum	2009.11.146.5	yes	complete	no	Purple, micaceous, fine-grained sandstone	102.8	31.8	7	concavo-convex

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Appendix 3, continued. Detailed inventory of Bracer Ornaments from Czech Republic and Hungary.

Site no.	General shape	Long sides	Short sides	Flanges	Sangmeister Type	Polishing (outer face)	Polishing (inner face)	Holes	New holes	Attempted holes	Ornamentation	Use wears	Origins of breaks	Reshaping	Comments
H032	trapezoidal	concave	straight	-	B	-	-	4	-	-	no	-	-	-	-
H033	trapezoidal	concave	convex	-	B	-	-	4	-	-	no	-	-	-	-
H033	trapezoidal	concave	concave	-	B	-	-	4	-	-	no	-	-	-	-
H034	rectangular	concave	convex	-	B	-	-	4	2	-	no	-	-	yes	-
H035	trapezoidal	concave	convex	-	B	-	-	4	-	-	no	-	-	-	-
H035	?	concave	straight	-	E	-	-	4	-	-	no	-	-	-	-
H036	rectangular	concave	convex	-	B	-	-	2	-	-	no	-	-	-	-
H037	rectangular	straight	convex	-	C	-	-	4	-	-	no	-	-	-	-
H038	rectangular	concave	concave/convex	-	-	-	-	3	-	-	-	-	-	-	-
H039	rectangular	straight	straight	-	D	fine	N/A	4	-	-	no	N/A	-	no	-
H040	trapezoidal	concave	concave	-	B	fine	medium	4	1	yes	no	slightly worn	blunt breaks and drilling break	no	-
H041	rectangular	straight	convex	-	C	fine	medium	4	-	-	no	slightly worn	thermal breaks	no	lines of ochre on the inner face
H041	rectangular	straight	convex	-	C	medium	medium	4	-	-	no	worn	blunt breaks	no	-
H042	rectangular	straight	straight	-	C	fine	fine	4	-	yes	no	slightly worn	sharp breaks	no	-
H043	rectangular	concave	concave	-	B	fine	medium	4	4	yes	no	N/A	blunt breaks	yes	2
H044	trapezoidal	straight	straight	-	C	medium	coarse	4	-	-	no	N/A	-	no	-
H045	trapezoidal	straight	concave	-	C	fine	medium	4	-	-	no	N/A	-	no	-

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Site no.	Site	District	Region	Country	Conservation	ID no.	Study	State	Burnt	Raw material	Length	Width	Thickness	Section
H046	Szigetszentmiklós 'Felső Úrge-hegyi dűlő', grave 162	Szigetszentmiklós	Pest	Hungary	Ferenczy Múzeum	2009.11.162.1	yes	1 end missing, several fragmented faces	yes	Grey, banded, micaceous, fine-grained sandstone	[82.2]	22.6	6.7	planoconvex
H047	Szigetszentmiklós 'Felső Úrge-hegyi dűlő', grave 164	Szigetszentmiklós	Pest	Hungary	Ferenczy Múzeum	2009.11.164.5	yes	complete, splintered faces	yes	Grey, banded, fine-grained sandstone	89.6	37.7	5.7	concavoconvex
H048	Szigetszentmiklós 'Felső Úrge-hegyi dűlő', grave 216	Szigetszentmiklós	Pest	Hungary	Ferenczy Múzeum	2009.11.216.4	yes	complete	no	Yellow, fine-grained sandstone	98.2	27	7.6	biconvex
H049	Szigetszentmiklós 'Felső Úrge-hegyi dűlő', grave 225	Szigetszentmiklós	Pest	Hungary	Ferenczy Múzeum	2009.11.225.5	yes	broken into several fragments	?	Reddish brown, micaceous, fine-grained sandstone	106.4	43.2	7.2	concavoconvex
H050	Szigetszentmiklós 'Felső Úrge-hegyi dűlő', grave 314	Szigetszentmiklós	Pest	Hungary	Ferenczy Múzeum	2009.11.314.5	yes	complete	no	Calcareous stone	55.2	20.6	4.3	biconvex
H051	Szigetszentmiklós 'Felső Úrge-hegyi dűlő', grave 339	Szigetszentmiklós	Pest	Hungary	Ferenczy Múzeum	2009.11.339.3	yes	1 broken corner, splintered faces	yes	Banded, fine-grained sandstone	108.6	29.4	7.6	planoconvex
H052	Szigetszentmiklós 'Felső Úrge-hegyi dűlő', grave 341	Szigetszentmiklós	Pest	Hungary	Ferenczy Múzeum	2009.11.341.3	yes	half	yes	Beige, banded, micaceous, fine-grained sandstone	[54.2]	35.4	6.6	concavoconvex
H053	Szigetszentmiklós 'Felső Úrge-hegyi dűlő', grave 362	Szigetszentmiklós	Pest	Hungary	Ferenczy Múzeum	2009.11.363.3	yes	1 broken edge	no	Beige, banded sandstone	94.6	31.6	6.7	biconvex
H054	Szigetszentmiklós 'Felső Úrge-hegyi dűlő', grave 374	Szigetszentmiklós	Pest	Hungary	Ferenczy Múzeum	2009.11.374.1	yes	1 broken edge	no	Beige, fine-grained sandstone	122.2	41.2	8.5	biconvex
H055	Szigetszentmiklós 'Felső Úrge-hegyi dűlő', grave 383	Szigetszentmiklós	Pest	Hungary	Ferenczy Múzeum	2009.11.383.3	yes	complete	no	Yellow, fine-grained sandstone pebble with brown veining	43.2	15.8	3.8	biconvex
H056	Szigetszentmiklós 'Felső Úrge-hegyi dűlő', grave 385	Szigetszentmiklós	Pest	Hungary	Ferenczy Múzeum	2009.11.385.1	yes	2 broken corners	no	Beige, banded, fine-grained sandstone	116.2	49.3	4.5	concavoconvex
H057	Szigetszentmiklós 'Felső Úrge-hegyi dűlő', grave 409	Szigetszentmiklós	Pest	Hungary	Ferenczy Múzeum	2009.11.409.3	yes	3 broken corners	no	Brown, fine-grained sandstone	103.8	[44.9]	7.1	concavoconvex
H058	Szigetszentmiklós 'Felső Úrge-hegyi dűlő', grave 410	Szigetszentmiklós	Pest	Hungary	Ferenczy Múzeum	2009.11.410.6	yes	complete	no	Pink, banded, sandstone	103.4	35	8	biconvex
H059	Szigetszentmiklós 'Felső Úrge-hegyi dűlő', grave 418	Szigetszentmiklós	Pest	Hungary	Ferenczy Múzeum	2009.11.418.2	yes	1 broken edge	yes	Grey, banded, very fine-grained sandstone	85.9	27.7	6.8	biconvex

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H046	rectangular	straight	convex	–	G	N/A	N/A	2	–	–	no	N/A	thermal breaks	no	–
H047	trapezoidal	straight	straight	–	C	medium	abrasion	5	–	–	no	N/A	thermal breaks	no	–
H048	rectangular	straight	convex	–	D	N/A	fine	4	–	–	no	N/A	–	no	–
H049	trapezoidal	concave	concave/convex	–	B	fine	medium	4	–	–	no	N/A	unspecified	no	–
H050	oval	convex	convex	–	G	N/A	N/A	2	–	–	no	N/A	–	no	–
H051	rectangular	straight	concave	–	D	fine	medium	4	–	–	no	worn	thermal breaks	no	–
H052	rectangular	straight	straight	–	C	fine	abrasion	4	–	yes	no	slightly worn	thermal breaks	no	–
H053	rectangular	straight	convex	–	D	N/A	N/A	4	–	–	no	N/A	drilling break	no	–
H054	rectangular	straight	convex/straight	–	D	fine	N/A	4	–	–	no	N/A	blunt breaks	no	ochre-stained on both faces
H055	oval	convex	convex	–	G	none	none	3	–	–	no	slightly worn	–	no	–
H056	rectangular	straight	convex/straight	–	C	fine	medium	4	1	yes	no	worn	blunt breaks	yes	ochre-stained on the inner face
H057	rectangular	concave	convex	–	B	fine	N/A	4	–	–	no	slightly worn	blunt breaks	no	–
H058	rectangular	convex	convex	–	E	fine	medium	4	–	–	no	N/A	–	no	–
H059	trapezoidal	convex	convex	–	E	fine	fine	4	–	–	no	slightly worn	thermal breaks?	no	–

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Site no.	Site	District	Region	Country	Conservation	ID no.	Study	State	Burnt	Raw material	Length	Width	Thickness	Section
H060	Szigetszentmiklós 'Felső Úrge-hegyi dűlő', grave 433	Szigetszentmiklós	Pest	Hungary	Ferenczy Múzeum	2009.11.433.14	yes	complete	-	Yellowish-beige medium-grained sandstone	81.4	17.4	5.6	biconvex
H060	Szigetszentmiklós 'Felső Úrge-hegyi dűlő', grave 433	Szigetszentmiklós	Pest	Hungary	Ferenczy Múzeum	2009.11.433.9	yes	chips at one end	-	Brown, banded, fine-grained sandstone	130.6	40.8	5	biconvex
H061	Szigetszentmiklós 'Felső Úrge-hegyi dűlő', grave 463	Szigetszentmiklós	Pest	Hungary	Ferenczy Múzeum	2009.11.463.5	yes	complete	no	Brown, banded, fine-grained sandstone	116.6	37.8	6.2	biconvex
H062	Szigetszentmiklós 'Felső Úrge-hegyi dűlő', grave 483	Szigetszentmiklós	Pest	Hungary	Ferenczy Múzeum	2009.11.483.3	yes	complete	no	Grey, banded, very fine-grained sandstone	124.9	40.5	5.5	concavo-convex
H063	Szigetszentmiklós 'Felső Úrge-hegyi dűlő', grave 505	Szigetszentmiklós	Pest	Hungary	Ferenczy Múzeum	-	no	1 broken end	-	-	-	-	-	-
H064	Szigetszentmiklós 'Felső Úrge-hegyi dűlő', grave 533	Szigetszentmiklós	Pest	Hungary	Ferenczy Múzeum	2009.11.533.1	yes	1 broken hole	no	Ochre, banded, veined sandstone	107.6	28.5	6.4	plano-convex
H065	Szigetszentmiklós 'Felső Úrge-hegyi dűlő', grave 539	Szigetszentmiklós	Pest	Hungary	Ferenczy Múzeum	2009.11.539.5	yes	complete	no	Grey, banded, very fine-grained sandstone	102.5	33	5.7	concavo-convex
H066	Szigetszentmiklós 'Felső Úrge-hegyi dűlő', grave 544	Szigetszentmiklós	Pest	Hungary	Ferenczy Múzeum	2009.11.544.2	yes	complete, splintered faces	yes	Greyish beige, banded, micaceous, fine-grained sandstone	125.8	31.8	6.3	plano-convex
H067	Szigetszentmiklós 'Felső Úrge-hegyi dűlő', grave 626	Szigetszentmiklós	Pest	Hungary	Ferenczy Múzeum	2009.11.626.5	yes	fragments	yes	Greyish beige, banded, fine-grained sandstone	101.5	40.3	6.3	concavo-convex
H068	Szigetszentmiklós 'Felső Úrge-hegyi dűlő', grave 634	Szigetszentmiklós	Pest	Hungary	Ferenczy Múzeum	2009.11.634.2	yes	complete	no	Reddish brown, very fine-grained sandstone	81.5	28	6.4	plano-convex
H069	Szigetszentmiklós 'Felső Úrge-hegyi dűlő', grave 637	Szigetszentmiklós	Pest	Hungary	Ferenczy Múzeum	2009.11.637.4	yes	complete	yes	Grey, banded, fine-grained sandstone	119	44.4	6.6	concavo-convex
H070	Szigetszentmiklós 'Üdülősor', grave 784	Szigetszentmiklós	Pest	Hungary	-	-	no	complete	-	-	100	23	5	biconvex
H071	Szigetszentmiklós 'Üdülősor', grave 863	Szigetszentmiklós	Pest	Hungary	-	-	no	complete	-	-	102	46	-	?
H072	Szigetszentmiklós 'Water Works', grave 7	Szigetszentmiklós	Pest	Hungary	-	-	no	complete	-	-	105	35	-	?
H072	Szigetszentmiklós 'Water Works', grave 7	Szigetszentmiklós	Pest	Hungary	-	-	no	4 fragments	-	-	[60]	36	-	?
H073	Tököl, grave 70	Szigetszentmiklós	Pest	Hungary	-	-	no	complete	-	-	-	-	-	concavo-convex

*Clément Nicolas*  
*Bracer Ornaments! An investigation of Bell Beaker stone 'wrist-guards' from Central Europe*  
 8 May 2020

Appendix 3, continued. Detailed inventory of Bracer Ornaments from Czech Republic and Hungary.

Site no.	General shape	Long sides	Short sides	Flanges	Sangmeister Type	Polishing (outer face)	Polishing (inner face)	Holes	New holes	Attempted holes	Ornamentation	Use wears	Origins of breaks	Reshaping	Comments
H060	rectangular	straight	convex	-	G	fine	fine	2	-	-	no	N/A	-	no	-
H060	rectangular	concave	concave	-	E	fine	medium	6	-	-	no	worn	blunt breaks	no	ochre-stained on the inner face
H061	rectangular	concave	concave	-	E	fine	medium	4	-	yes	no	slightly worn	-	no	-
H062	rectangular	concave	convex	-	B	medium	medium	4	-	-	no	slightly worn	-	no	-
H063	-	convex	straight	-	-	-	-	2	-	-	-	-	-	-	-
H064	rectangular	straight	convex	-	D	N/A	N/A	4	-	-	cup-marks	N/A	unspecified	no	-
H065	rectangular	straight	concave	-	C	fine	coarse	4	-	-	no	worn	-	no	-
H066	rectangular	concave	concave	-	E	fine	fine	4	-	-	cup-marks	slightly worn	thermal breaks	no	-
H067	rectangular	straight	concave/convex	-	C	fine	fine	4	-	-	no	slightly worn	thermal breaks	no	-
H068	rectangular	convex	straight	-	G	fine	medium	2	-	-	no	worn	-	no	-
H069	rectangular	concave	straight	-	B	fine	medium	4	-	-	no	slightly worn	-	no	-
H070	rectangular	straight	convex	-	G	-	-	2	-	-	no	-	-	-	-
H071	trapezoidal	concave	convex	-	-	-	-	4	-	-	no	-	-	-	-
H072	trapezoidal	concave	concave	-	-	-	-	4	-	-	no	-	-	-	-
H072	rectangular	concave	concave	-	-	-	-	4	-	-	no	-	-	-	-
H073	rectangular	concave	convex	-	B	-	-	4	-	-	no	-	-	-	-

