

Late Bronze Age spears in the ‘floor’ from Velem-Szent Vid, Hungary

Kopí z pozdní doby bronzové v „podlaze“
z Velem-Szent Vid, Maďarsko

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The study introduces a spearhead hoard from the Velem-Szent Vid hillfort (Vas County, Hungary), which was retrieved by the joint research project of the Eötvös Loránd University Institute of Archaeological Sciences and the Centre archéologique européen du Mont Beuvray in 1993. The two spearheads were found next to each other, inserted into the ground of a potential house floor, on a settled plateau of the Velem-Szent Vid hillfort. The spearheads' parallels stretched beyond the borders of the Carpathian Basin. Based on the analysis of spearhead no. 1, we consider it most likely that this assemblage was deposited in the Ha B1 period. The spearheads were studied by a digital USB microscope-camera for documenting production, technological, and use-wear traces. The two studied objects were identified as finished, used products of actual combatants based on micro traces. They were probably mounted on shafts and could be put on display inside a house or in a settled area. The two weapons may constitute a reversible dual hoard that was eventually abandoned at a single point. Alternatively, they could be seen as a set of trophies looted from defeated enemies, serving as a reminder of a triumphant battle.

use-wear analysis – spearheads – Late Bronze Age – Carpathian Basin – hoards

Článek představuje depot hrotů kopí z hradiště Velem-Szent Vid (župa Vas, Maďarsko), který byl vyzvednut v roce 1993 během společného výzkumného projektu Institute of Archaeological Sciences Univerzity Loránda Eötvöse a Centre archéologique européen du Mont Beuvray. Dva hroty kopí byly nalezeny vedle sebe uložené pravděpodobně do podlahy domu na osídlené plošině hradiště Velem-Szent Vid. Distribuce analogických nálezů přesahuje hranice Karpatské kotliny. Na základě analýzy hrotu kopí č. 1 považujeme za nejpravděpodobnější, že tento soubor byl deponován v období Ha B1. Hroty kopí byly zkoumány za použití digitální USB mikrokamery pro dokumentaci výrobních, technologických a traseologických stop. Studované předměty byly na základě mikroskopických stop určeny jako hotové používané výrobky skutečných bojovníků. Byly pravděpodobně nasazeny na ratištích a mohly být vystaveny v rámci domu nebo sídliště. Tyto dvě zbraně mohly představovat reverzibilní dvojdepot, který byl nakonec v určitý moment opuštěn. Eventuálně se mohlo jednat o trofejní zbraně uloupené poraženým nepřátelům, které sloužily jako upomínka vítězné bitvy.

traseologická analýza – hroty kopí – pozdní doba bronzová – Karpatská kotlina – depoty

Introduction

The Savaria Museum in Szombathely holds two spearheads from the Velem-Szent Vid hillfort (Vas County, Hungary). These artefacts were found during the Hungarian-French excavation of the Eötvös Loránd University Institute of Archaeological Sciences and the Centre archéologique européen du Mont Beuvray (see Czajlik *et al.* 1995; Czajlik 2022, 68–69). Based on available information, our current working hypothesis is that the two spearheads create a single assemblage, probably an intentionally deposited hoard, which was most likely deposited within a settled area. The arrangement of spears from Velem resembles similar hoards of swords or spears, which were also deposited vertically in

close proximity to each other. This spearhead hoard from Velem is a unique find, which was left out of major Hungarian and international publications. It represents a less-known Carpathian Ha A2/B1 (11–10th century BC), Ha B1 (10th century BC) hoard type consisting exclusively of spearheads. Both finds have an extensive group of parallels beyond the Carpathian Basin with strong links to western Central Europe, northern Balkans, the Alpine regions, and Northern Europe. The state of preservation also provides a unique opportunity to draw conclusions based on technological and use-wear traces about the object biographies and the fighting style of their owners. This study aims to provide the first publication of these important finds and discuss their typo-chronological as well as technological characteristics. We also propose ideas on the interpretation of these finds, which we present as working hypotheses for future discussion and investigation.

Find Context

The two spearheads were discovered on a metal detector survey led by Diego Avoscan on July 5, 1993. They lied next to each other, inserted into the ground. The excavation journal, written by Zoltán Czajlik and Vajk Cserményi, describes in records from June 12th and July 9th, 1993, the circumstance of discovery as follows: ‘*We found two pieces of Late Bronze Age spearheads in the zone of the middle plateau with a metal detector, along the path between the scout house and the chapel. They were inserted into the side of the plateau, in an undisturbed cultural layer. This place was once the Bonya estate, which was investigated by [baron Kálmán] Miske, judging from the pits. We opened a 1×2-meter trench. This is sector 09. Traces of modern disturbance, pits were not present near the arrow-heads [spearheads], they were inserted into a rough stony yellow layer rich in ceramics. Due to the lack of time, we were unable to check whether this layer was a floor level. [...]*’ (Savaria Museum, Arch. Document No. RA 1139, p. 5; *online supplementary material 1; fig. 1; fig. 2*).

Besides the excavation journal, no additional documentation was available on these finds in the archives of the Savaria Museum. The two spearheads were found in the very first pioneering archaeological metal-detector survey. At that time, no protocols existed for the documentation and excavation of metal objects, particularly hoards. Thus, the available written and visual documents represent the level of research in the early 1990s meaning that some information which is now a standard part of excavation workflow, was not recorded. The whole situation was not excavated in the full extent; only a small trench (1×2 m) was opened around the spears. Based on archive photographs (*fig. 2: 3*) and information provided by Zoltán Czajlik (*pers. comm.*), the spearheads were found near the present surface. This can be considered common for hoards found in Hungarian hill-forts and hill-top settlements. Numerous examples of hoards documented by modern methodology support this pattern (see examples in *V. Szabó 2019*). Zoltán Czajlik also confirmed that the object was embedded in a cultural layer, which is typical for local Transdanubian Urnfield houses. The stony layer rich in potsherds can be also seen on the digitally zoomed photographs of the context (*fig. 1: 2; fig. 2: 2*). Naturally, this observation must be clarified in the future by further excavation, which goes, however, beyond the objectives of this study. It is likely that sector 09 matches the settlement area inhabited during the Late Bronze Age. The documentation of the research program also reports

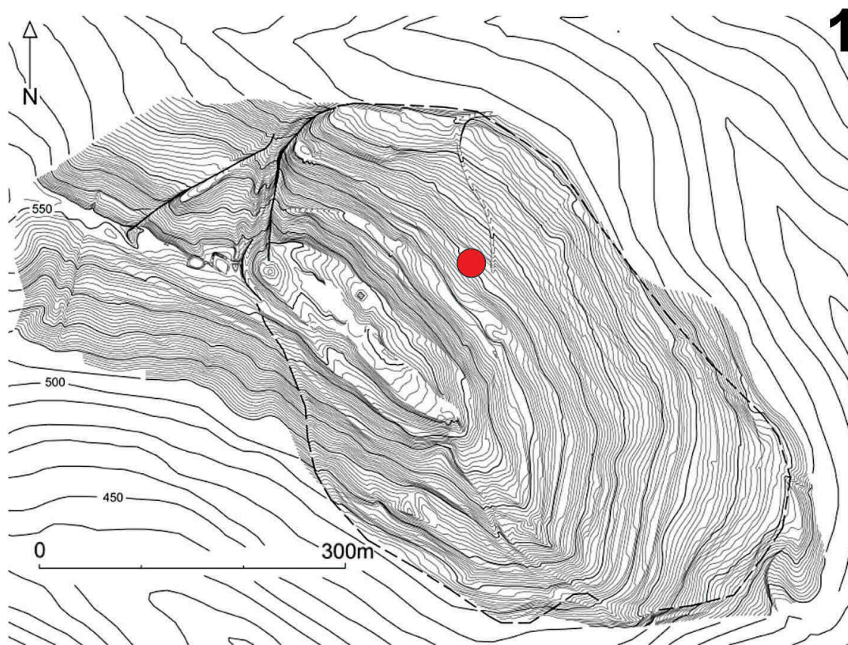


Fig. 1. 1 – The location (Sector 09) of the two spearheads (map modified after *Guillaumet 2000*, Fig. 3; Eötvös Loránd University, Institute of Archaeological Sciences); 2 – The context of the two spearheads (after *Savaria Museum*, Arch. Document No. RA 1139).

Obr. 1. 1 – Pozice (sektor 09) dvou hrotů kopí (mapa upravena podle *Guillaumet 2000*, Obr. 3; Eötvös Loránd University, Institute of Archaeological Sciences); 2 – Nálezový kontext dvou hrotů kopí (podle *Savaria Museum*, arch. dokument č. RA 1139).

that Urnfield potsherds with faceted rims were found in this sector (*Savaria Museum*, Arch. Document No. RA 1139, *online supplementary material 1*).

Typo-chronology

Description of the finds

Velem-Szent Vid hoard, 1993

- 1) Spearhead (Savaria Museum, Ő.2021.3.1): The first spearhead has a short conical socket and a long, willow-shaped blade with outline grooves. It has two peg holes. The lower part of its blade is slightly angular. The midrib becomes rectangular-sectioned towards the tip. The socket and the lower part of the midrib are decorated with chased bundles of lines, bundles of curves, and fine triangle patterns. Length: 240.64 mm, Diameter of the rim: 25.01×24.77 mm, Width of the blade-midrib interface: 42.53×13.92 mm, Thickness of the blade: 2.20 mm, Weight: 258.6 g (with a stone inside; *fig. 3; fig. 5; fig. 9*).
- 2) Spearhead (Savaria Museum, Ő.2021.3.2): The spearhead has a short conical socket, two peg holes, two wooden pegs, and a relatively large leaf-shaped blade. This weapon is undecorated. A bit of the wooden shaft is preserved inside the socket. Length: 204.82 mm, Diameter of the rim: 24.10×23.90 mm, Width of the blade-midrib interface: 43.69×12.98 mm, Thickness of the blade: 1.52 mm, Weight 163.6 g (with a wooden shaft inside; *fig. 4; fig. 10; fig. 11*).

Spearhead no. 1

Parallels of spearhead no. 1 are known from the Carpathian Basin, but this weapon is essentially not a local type (*fig. 7*). The spearhead has a distinct blade that is slightly rectangular at the bottom (*Lanzenspitzen mit eckigem Blattansatz*). These weapons have two essential variants. They have either a long willow-shaped blade or a long flame-shaped one, which groups of parallels and their relative chronological positions have been re-evaluated by many scholars since the study of Holste (see *Holste 1935*, 69–71; *Egg 1992*, 404–405; *Říhový 1996*, 53–54; *Turk 1996*, 80–82; *Tarot 2000*, 13–14; *Möslein 2001*, 206; *Bader 2015*, 382, tab. 42; *Vasić 2015*, 60–61). The no. 1 spearhead from Velem-Szent Vid belongs to the variant with the long willow-shaped blade. Recently, these spearheads can be classified as the Bader's Group B5, which is a family of weapons occurring in the northern Balkans, western Central Europe, and the Carpathian Basin (*Bader 2015*, 382, tab. 42). Leshtakov classified similar spearheads as Shape E, Type V (so-called Dancu type). According to his analysis, these weapons can be dated between the Ha A2 and Ha B1/Ha B2 periods (*fig. 8; Leshtakov 2015*, 233–234, pl. 41: 3).

Notable parallels come from the territory of Transdanubia in western Hungary. Sashgyi found a similar stray-find spearhead at the site of Pomáz-Kő-hegy in the Visegrád Mountains in 1943. Similar stray-find spearheads were discovered at the Velem-Szent Vid (*online supplementary material 2; fig. 6*) and Sopron-Várhegy (Burgstall) sites. It cannot be ruled out that one of the spearheads from the Keszthely hoard (Ha A1) could also be a fragment of such a weapon (*Miske 1907*, pl. 31: 1; *Mozsolics 1985*, 137–138, pl. 130: 7;

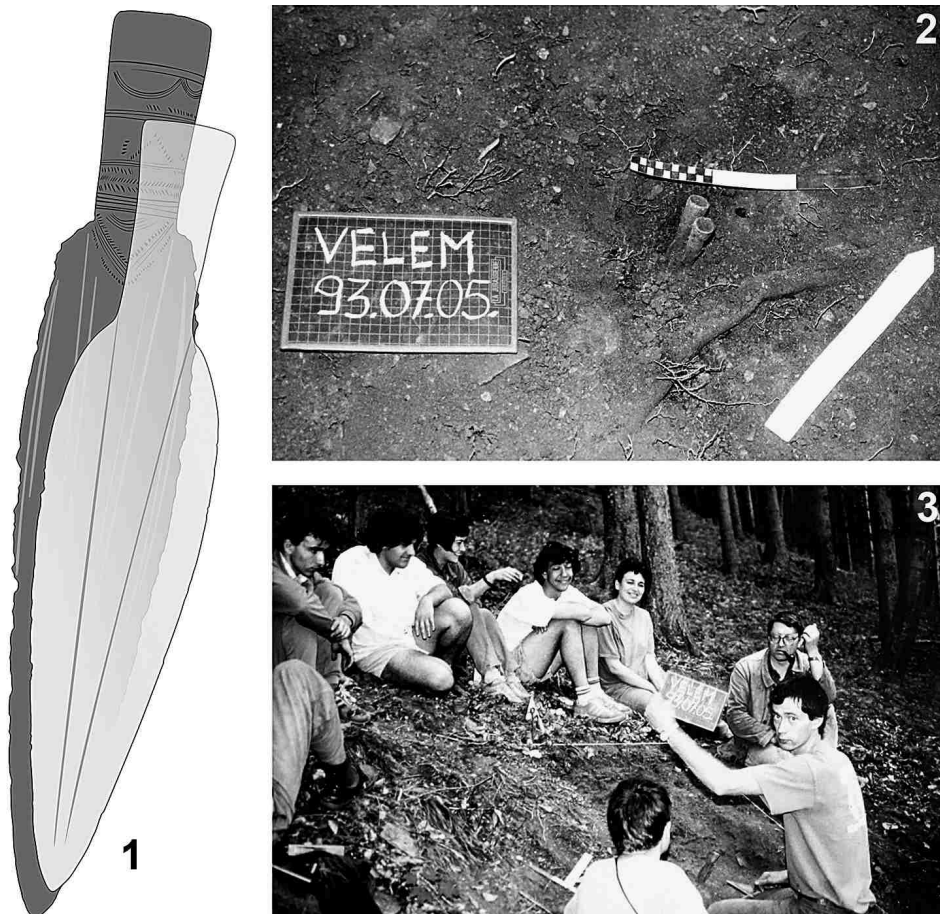


Fig. 2. 1 – The reconstructed context of the two spearheads; 2 – Photo of the context of the spearheads; 3 – Photo of the sondage (after *Savaria Museum*, Arch. Document No. RA 1139).

Obr. 2. 1 – Rekonstruovaný náleзовý kontext dvou hrotů kopí; 2 – Fotografie náleзовého kontextu dvou hrotů kopí; 3 – Fotografie sondáže (podle *Savaria Museum*, arch. dokument č. RA 1139).

Tarbay 2022, 202, fig. 5: 7, pl. 42: 14). One example can be mentioned from Austria. It was discovered in Rannersdorf (*Reiter – Linke 2016*, 169, fig. 54: 4); another spearhead was discovered in Flintsbach a. Inn, Rachelburg, on the German territory but very close to the Austrian border (*Möslein 2001*, 206, fig. 1: 10). In Germany, further spearheads, which can be associated with the spear no. 1 of Velem, were identified in the Ha B1 assemblage from München-Widenmayerstraße (*Müller-Karpe 1961*, pl. 46:17, pl. 47A: 8). The object also shares similarities with the spearhead from Basadingen, Switzerland (*Tarot 2000*, 54, 69, pl. 36: 57). Further parallels can be mentioned from Campore in Bargone, an Italian Terramare site dating back to the Recent Bronze Age, which is approximately parallel with the Br D period (*Bruno 2012*, 436–437, 593, fig. A: 102). The decorated spearhead from Ums bei Völs am Schlern also shares similarities with the artefact from Velem-Szent Vid (*Wieser 1892*, 574, pl. 5: 1; *Demetz 1987*, 64, pl. 9: 4).



Fig. 3. The spearhead no. 1 from the Velem-Szent Vid hoard (Savaria Museum, photo: J. G. Tarbay).

Obr. 3. Hrot kopí č. 1 z depotu z Velem-Szent Vid (Savaria Museum, foto: J. G. Tarbay).

In the northern Balkans, a handful of similar weapons are known. There are two examples from the Serbian Phase II hoards found in Jakovo and Krčedin II (Vasić 2015, 60, pl. 15: 205, 208). Another example was discovered in the Ljubljanica River running through Ljubljana, Slovenia (Šinkovec 1995, 89–90, pl. 26: 169). In Croatia, the spearhead from the Zagreb (Phase II) and Donja Bebrina (Phase III) hoards can be mentioned as parallels (Vinski-Gasparini 1973, 213, 222, pl. 74A: 1, pl. 94: 6). The southernmost appearance of Velem-Szent Vid's spearheads' parallels is known from Greece. While the first is an unprovenanced find from a private collection, the other was found in a burial site at Diakata Mountain between Metaxata and Argostolion. Avila (1983, 63, pl. 18: 133–134) has also noted that these spearheads are not typical in this territory and most likely arrived from southeast Central Europe, the northern Balkans, or Italy.

Unlike cast ornaments, the chased decoration of weapons, particularly of spearheads, is usually individual (fig. 5). The execution of the patterns on spearhead no. 1 is carefully

Fig. 4. The spearhead no. 2 from the Velem-Szent Vid hoard (Savaria Museum, photo: J. G. Tarbay).

Obr. 4. Hrot kopí č. 2 z depotu z Velem-Szent Vid (Savaria Museum, foto: J. G. Tarbay).



made, suggesting that they were well-planned and not improvised. The elements of the spearhead's design, such as bundle curves, show strong relations with the different types of spearheads found in the territory of Switzerland dated to Horizon 5 (Ha B1): e.g., Cudrefin, Port-Zihl canal, Zürich, Zug-Stumpf (*Tarot 2000*, 55, 60, 64, 72, 90, 95, 97, pl. 12: 645, pl. 13: 134, pl. 15: 693, pl. 70: 536). Spearheads decorated in a similar style are generally associated with the Ha B1 and Ha B2 periods (see *Jacob-Friesen 1967*, 262–264).

Spearhead no. 2

An identical long spearhead was found in burial no. 127 with weapons excavated at Sopron-Krautacker. This assemblage was dated to the Ha B1 period based on the chronological position of metal and ceramic finds (*Jerem–Metzner-Nebelsick 2002*, 314. fig. 2: 1, fig. 5: 2a–b). In Hungary, similar spearheads were found in the Ha B1 hoard from Takta-kenéz (*Mozsolics 2000*, 80–81, pl. 100: 6, 19).

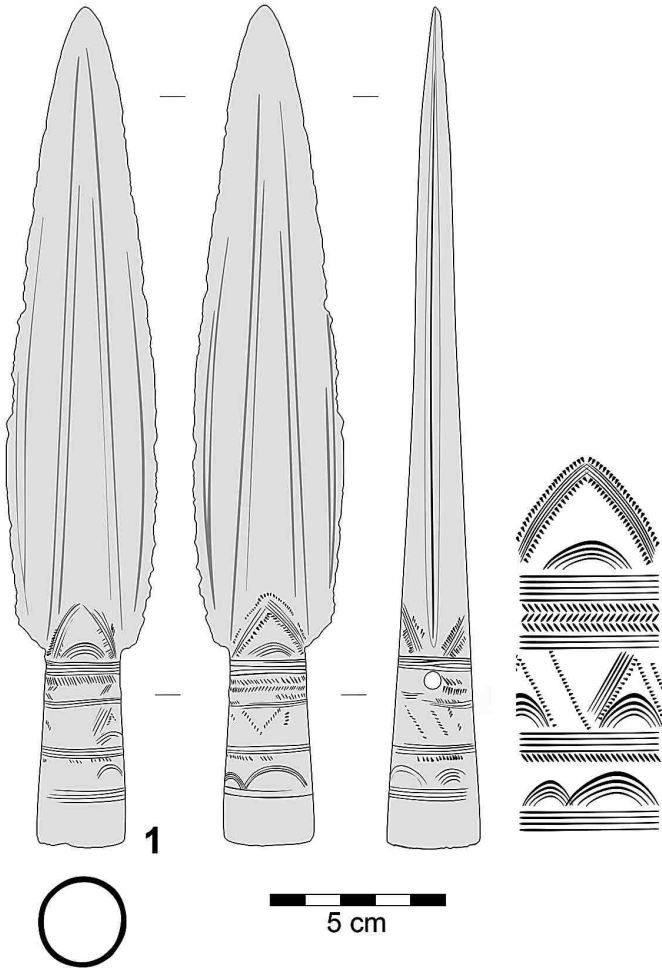


Fig. 5. The decorative patterns on spearhead no. 1 (drawings: J. G. Tarbay).
Obr. 5. Výzdobné vzory na hrotu kopí č. 1 (kresba: J. G. Tarbay).

There have been related finds to the studied spearhead from the Austrian territory. One was recovered from the Enns River, another was excavated at the Linz-St. Peter cemetery (*zu Erbach 1985*, pl. 30D: 1, pl. 79: 3; *zu Erbach 1986*, 27, 112). A similar spearhead was found at the Castellace burial site in Italy. This object was dated to the end of the Final Bronze Age (10th century BC, ca. Ha B1; *Bianco Peroni 1970*, 6–7; *Bianco Peroni 1974*, 17, pl. 3: 182A).

In Moravia, a handful of undatable stray-find spearheads from Jarovice, Veletiny, Linhartice, and one from an unknown site located in Moravia but possibly also in Slovakia can be related to the second item from Velem-Szent Vid. The spearhead from the Drslavice 1 hoard, which can be dated to the Br D2 period, shows that this type was produced for a long time in Moravia. Another parallel of the Velem spearhead from grave no. 5 from Mohelnice belonged to a younger, Ha A2/B1 transition period (*Říthovský 1996*, 30, 38–39, 44, pl. 2: 12–13, 15, pl. 3: 19, pl. 4: 32, pl. 6: 47). Identical spearheads were also discovered in Bohemia for instance in the Porta Bohemica area (Labe River canyon in NW Bohemia),



Fig. 6. A stray-find spearhead from Velem-Szent Vid (Savaria Museum) and use-wear traces: 1 – dull tip, 2 – notches, 3 – worn notches (*online supplementary material 2: 1.1*; photo and micrographs: J. G. Tarbay).
 Obr. 6. Ojedinelý nález hrotu kopí z Velem-Szent Vid (Savaria Museum) a traseologické stopy: 1 – tupý hrot, 2 – vroubky, 3 – opotřebované vroubky (*online příloha 2: 1.1*; foto a mikroskopové snímky: J. G. Tarbay).

at the Chrudim site (Br C/D – Ha A1), and similar spearhead comes also from the hoard found in Jaroměř which was dated to the Ha A period (*Kytlicová 2007, 259, 266–267, 292–293, pl. 122: 45, pl. 160D: 3, pl. 167C: 2*).

Similar long spearheads were in use throughout Northern Europe. Jacob-Friesen classified these as West Baltic types (*Jacob-Friesen 1967, 250–261*). Among this group, important examples similar to the no. 2 Velem-Szent Vid spearhead can be cited from Poland, where these weapons are known from dated hoard contexts, except for a few stray finds (Bochotnica, Jedwabno, Szydłówek-Zgrzebsk) and a wetland find (Szczecin-Podjuchy).

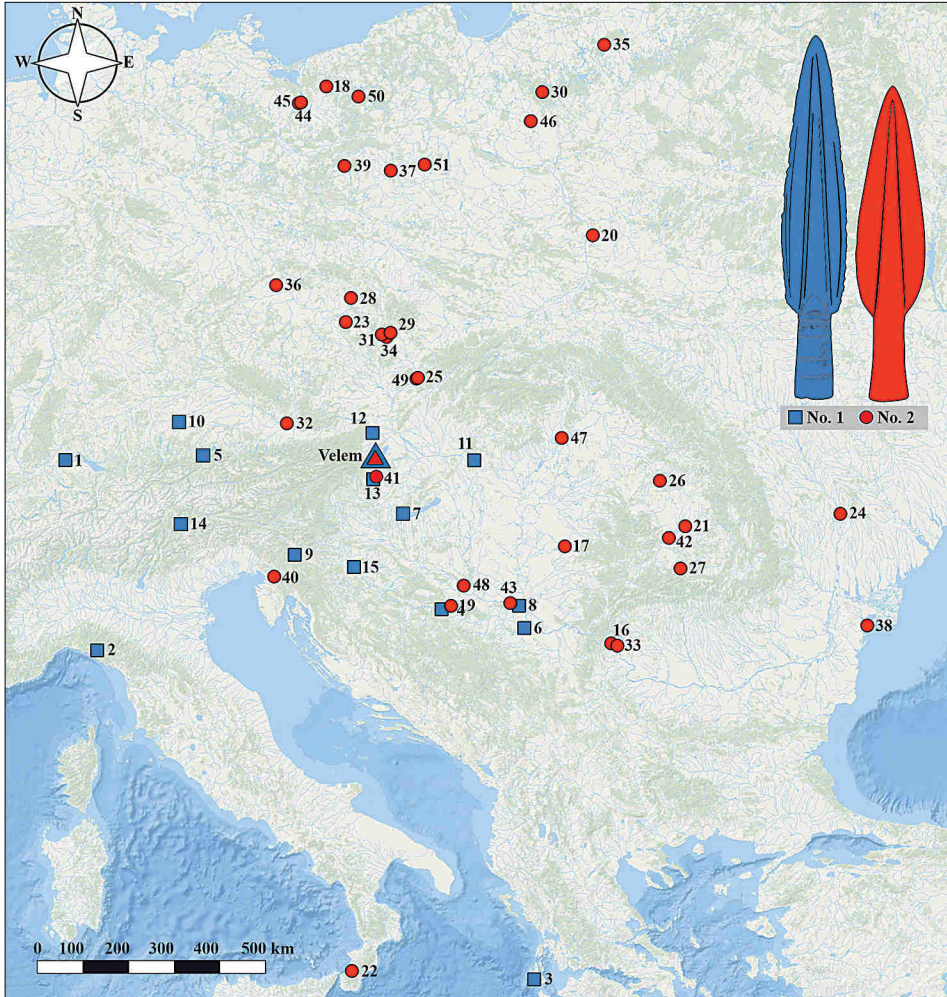


Fig. 7. Distribution of parallels to Velem-Szent Vid spearheads. Spearhead no. 1 (blue rectangle): 1 Basadingen, 2 Campore in Bargone, 3 Diakata Mountain between Metaxata and Argostolion, 4 Donja Bebrina, 5 Flintsbach a. Inn, Rachelburg, 6 Jakovo, 7 Keszthely, 8 Krčedin II, 9 Ljubljana River in Ljubljana, 10 München-Widenmayerstraße, 11 Pomáz-Kő-hegy, 12 Rannersdorf, 13 Sopron-Várhegy, 14 Ums bei Völs am Schlern, 15 Zagreb. Spearhead no. 2 (red circle): 16 Alun in Brza Palanka, 17 Arad II, 18 Bienice, 19 Beravci, 20 Bochotnica, 21 Căpușu de Cămpie, 22 Castellace, 23 Chrudim, 24 Dancu III, 25 Drslavice I, 26 Frâncenii de Piatră, 27 Gusterița II, 28 Jaroměř, 29 Jarovice, 30 Jedwabno, 31 Linhartice, 32 Linz-St. Peter, 33 Mileni, 34 Mohelnice Grave 5, 35 Osowo, 36 Porta Bohemica Labe, 37 Poznań-Wielka Starofeka, 38 Sălciouara, 39 Siercz, 40 Škocjan Caves, 41 Sopron-Krautacker, 42 Špálnaca II, 43 Sremski Karlovci, 44 Szczecin-Kleşkowo, 45 Szczecin-Podjuchy, 46 Szydłówek-Zgrzebsk, 47 Taktakenéz, 48 Tenja, 49 Veletiny, 50 Wierzchowo, 51 Witkowo. Obr. 7. Distribuce nálezů analogických ke hrotům kopí z Velem-Szent Vid. Kopí č. 1 modrý čtverček, kopí č. 2 červené kolečko.

The earliest specimen from the second half of Period III (Ha A1) is known from the Osowo hoard. Two were recovered from hoards dated to Period IV (Ha A2/B1): Poznań-Wielka Starofeka and Siercz. Most of them were found in Period V (Ha B2/B3) assemblages like

Bienice, Szczecin-Kleşkowo, Wierzchowo, and Witkowo. The site of Szczecin-Kleşkowo also offered an important analogy, as the hoard consisted of two spearheads like in the case of Velem-Szent Vid (*Gedl 2008*, 29–30, 34–35, 59–60, pl. 2: 13, pl. 5: 44, pl. 6: 47–49, pl. 7: 55, pl. 18: 220, 222, pl. 19: 231–233, pl. 20: 239).

There are also stray-find spearheads from the northern Balkans found within the Sremski Karlovci area that can be linked to the discussed find. Considering relative chronology, the spearhead from Alun in Brza Palanka is important since this artefact was part of a hoard dated by Vasić to the Ha B1 period (*Vasić 2015*, 33, 38, pl. 2: 18, pl. 5: 61). In addition to Serbian examples, there are a handful of spearheads from northern Croatia that can be associated with the studied object, e.g., Beravci (Phase IV), Tenja (Phase II) (*Vinski-Gasparini 1973*, 212, 220, pl. 32: 12, pl. 108: 19). A similar spearhead was discovered also in the Škocjan cave complex (*Teržan et al. 2016*, pl. 8: 6).

In Romania, a similar spearhead was found as parts of hoards from Arad 2 (decorated, Ha B1), Căpușu de Cămpie (Ha A2), Frâncenii de Piatră (Ha A1), Gusterița 2 (Ha A1), Mileni (Ha A – Ha A2/B1), Sălcioara (Ha A2), Șpălnaca 2 (Ha A1) (*Petrescu-Dîmbovița 1978*, 119–122, 127–131, 137, 139, pl. 100A: 17, pl. 115: 267, pl. 152: 413, pl. 215B: 14, pl. 222B: 3, pl. 223: 25; *Crăciunescu 2005*, 211, fig. 4: 1–3). A long spearhead from Dancu III (stray find) can also be cited as a parallel from Moldova (*Dergačev 2002*, 47, pl. 50A).

Summary of results

Both spearheads from Velem represent widespread types deposited for extended periods. No. 1 shows a strong distribution in the Alps and the northern Balkans, whereas artefacts similar to no. 2 were found in the area stretching from the Carpathian Basin to northern Poland (*fig. 7*). A fundamental problem with the no. 1 spearhead is that many finds give no chronological information. The datable ones are scattered between Br D and Ha B1. Based on the relative chronological data currently available, the no. 1 spear is probably associated with the Ha B1 (10th century BC) or alternatively with the Ha A2/B1 period (11–10th century BC). The hypothesis of Ha B1 dating is based primarily on the Swiss parallels of the spearhead's decoration. The second spearhead is the most difficult to date. The predominance of simple spearheads with leaf-shaped blades is essentially characteristic of the Ha A2/B1 and Ha B1 period hoards, but the number of parallels from the Br D2 and Ha B3 periods is also considerable. Being a common form, the typo-chronological data of the no. 2 spearhead cannot be considered. For this reason, it would be important to submit the wood remains from the spearhead socket to radiocarbon dating. To sum up, the assemblage from Velem-Szent Vid is probably related to the Ha B1 period (*fig. 8*).

Macroscopic observations

The objects were examined in their cleaned state after museum restoration. The no. 1 spearhead showed heavy fragmentation along its cutting edges and traces of pitting corrosion on its socket, which limited the effectiveness of identification of micro-wear traces. No. 2 was completely intact, and the preservation of its cutting edge was optimal for the identification of fine traces. No modern disturbances or damages were identified on the two

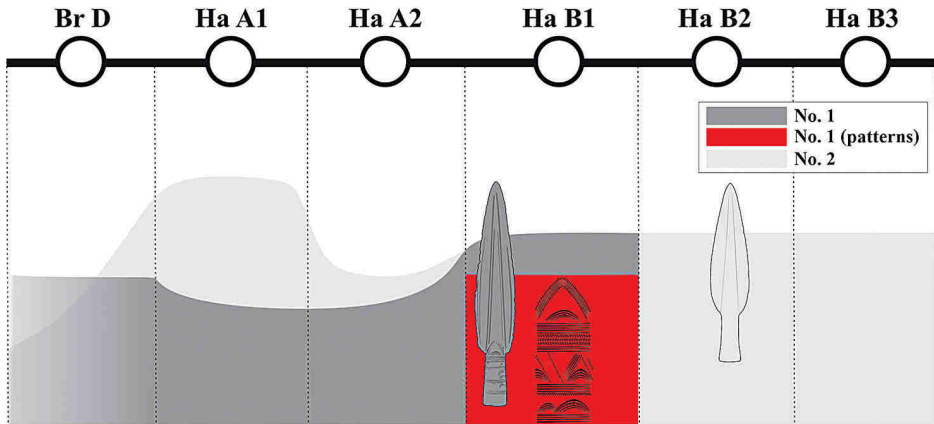


Fig. 8. Relative chronological position of Velem-Szent Vid spearheads' parallels.
Obr. 8. Relativní chronologie nálezů analogických ke kopím z Velem-Szent Vid.

artefacts. The micrographs were made using a Digi-Micro Mobile digital USB microscope-camera (Digital magnification: 20×–500×, Optical photographs: 2592×1944 Pixel) to visualize and document macroscopic observations on the studied objects from Velem-Szent Vid. For the identification of technological traces, we relied on the experimental and technological works on bronze spearhead manufacturing by Bader, Geiger, and Trommer (*Bader et al. 2012; Trommer – Bader 2013*). For the identification of wear traces, we relied on seminal works involved in the discussion of the experiment and use-wear analysis of Bronze Age spearheads and swords (*Anderson 2011; Horn 2014; Gentile – van Gijn 2019; Hermann et al. 2020*).

Spearhead no. 1

Spearhead no. 1 has a narrow willow-shaped blade and a somewhat flat midrib. The overall blade construction of this weapon resembles a long dagger. Considering its total length, it is most similar to other long spearheads found nearby: Sopron-Várhely and Rannersdorf (*fig. 12*).

Due to its comprehensive post-casting treatment, any casting-related traces were hardly observed on this spearhead (*fig. 3*). It was probably made in a two-piece mould with two negatives, one casting core and one fixing rod, as most spearheads from this period were (*Bader et al. 2012*). Such spearhead-casting moulds are known even from the Velem-Szent Vid site (*Miske 1907*, pl. 15: 1; *Ilon 2018*, 119–120, *fig. 3: 3*). The entire surface of the spearhead was ground carefully. Characteristic traces of this process are the vertical striations observed on the blade, midrib, and socket (*fig. 9: 1, 5*). Analogies of this trace are known from other Transdanubian assemblages. The wide outline grooves (fullers) of the blade, which follow the silhouette of the cutting edge, were probably applied after casting. The exact technique cannot be identified by macroscopic observations, but it can be assumed that these decoration elements were executed with a special anvil and hammer. They may also have served to widen the as-cast blade. The cutting edge was hardened by hammering (*fig. 9: 1–2*) related to cold hammering and/or annealing. Based on the slant

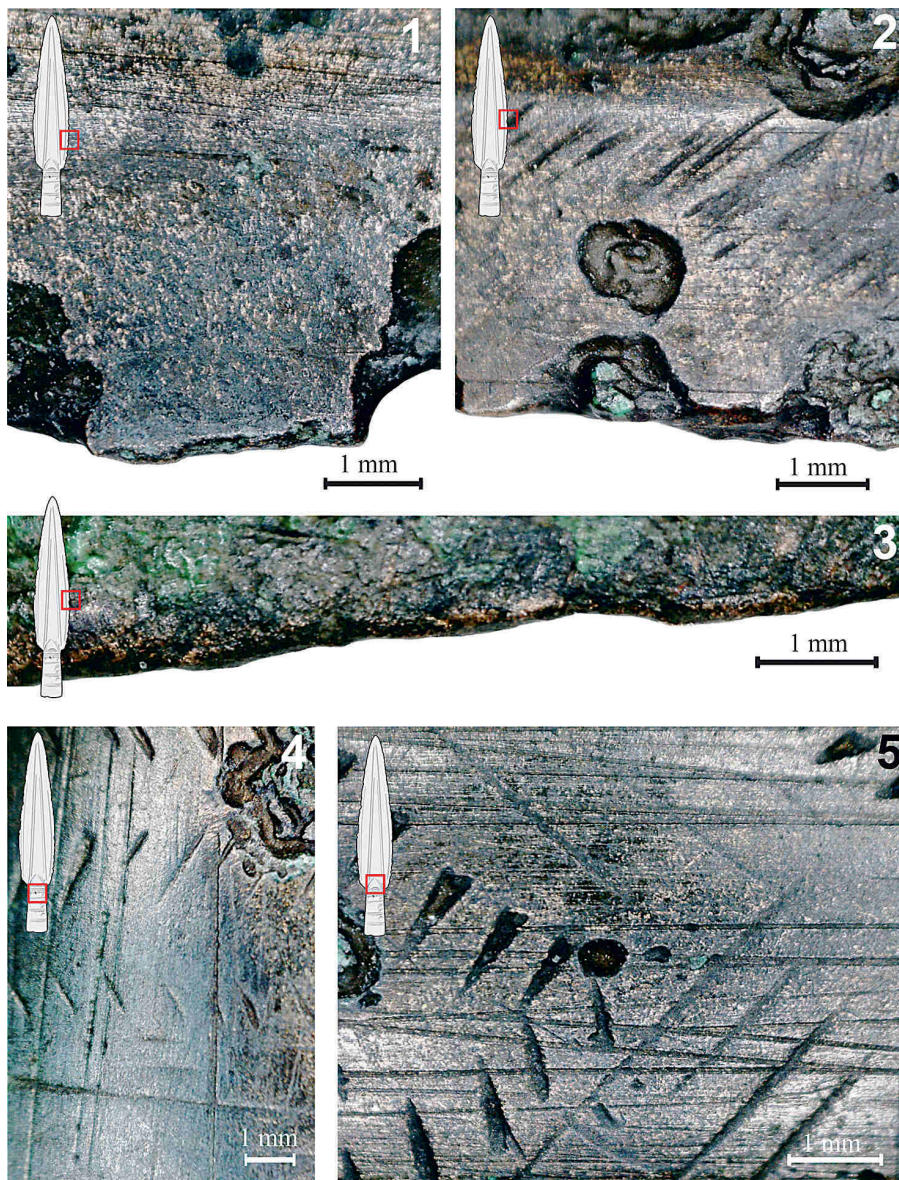


Fig. 9. Observations on spearhead no. 1: 1 – hammered edge and grinding marks, 2 – hammered edge and sharpening traces, 3 – dent of unknown date, 4 and 5 – worn decorations (micrographs: J. G. Tarbay).
 Obr. 9. Pozorování na hrotu kopí č. 1: 1 – okraj s údery kladiva a stopy obroušení, 2 – okraj s údery kladiva a stopy ostření, 3 – zásek neznámého stáří, 4 a 5 – opotřebované dekorativní prvky (mikroskopové snímky: J. G. Tarbay).

striations on the cutting edge, the spearhead was sharpened (*fig. 9: 2*). On the lower mid-rib and the entire socket, fine chased patterns are visible. These were most likely made by single-edged chasing awls. It should be noted that several examples of this tool are known

from the Velem-Szent Vid site (*Miske 1907*, pl. 29: 48–63). The complex decorative patterns on the spearhead are well-planned and well-executed (*fig. 5; fig. 9: 4–5*). Unfortunately, the spearhead's cutting edge and tip are heavily fragmented due to the preservation conditions and likely taphonomic fractures. Only dents of uncertain origin can be identified on this part (*fig. 9: 3*). Along the decorated part, characteristic use-wear traces were observed.

As a result of heavy abrasion, some parts of the chased patterns were worn away (*fig. 9: 4–5*). This can be considered a characteristic use-wear trace related to objects with a long use-life. In terms of use, this is a particularly important observation, as it suggests that the metal spearhead may have been inserted into a short shaft and the socket and midrib gripped like swords (*Kristiansen 2002*, 330, *fig. 7; Tarbay 2016*, *figs. 3–4, 8–10*).

Spearhead no. 2

Although spearhead no. 2 is much smaller than no. 1, it is still considered relatively large when compared to most Late Bronze Age finds. Its large and leaf-shaped blade is suitable for carrying out cutting actions and causing deep wounds during thrusting and slashing. Among its closest parallels, it is most similar in length to the Serbian Sremski Karlovci, Polish Szczecin-Podjuchy, and Moldovan Dancu III spearheads (*fig. 12*).

Ground casting seams are still observable along the narrow sides of the socket, which evidences that this spearhead was made using similar techniques to no. 1. Along the cutting edges, hammering traces related to cold hammering and/or annealing are visible (*fig. 10: 4*). Distinctive hammering traces can also be observed on the midrib near the spearhead's tip. Also, fine vertical striations caused by grinding are present on the entire surface of the weapon. The blades of the spearhead are asymmetrical, which could be caused by a mismatching casting defect or the repair of one blade part after substantial damage. The socket's rim is well polished, with some pores caused by shrinkage porosity visible along its edges. The cutting edge is sharpened (*fig. 10: 2*). Like in the case of no. 1, this part is fractured as well. Dents of uncertain origin (*fig. 10: 1*), U- and V-notches (*fig. 10: 1, 3*) can be observed along this part. The spearhead's tip is slightly rounded. A horizontal crack is also visible on the midrib near the tip. This may be related to usage as a result of stress caused by the impact of another weapon. Another scenario is that the spearhead had stuck into a hard material (e.g. shield) and slightly cracked after removal (see *Hermann et al. 2020*, 56). Potential traces of use densify in the tip area.

Inside the socket, remains of the wooden shaft's tip are preserved (*fig. 11: 1*). In addition, a rarely preserved part of two wooden pegs is visible along the narrow sides of the socket (*fig. 11: 2–3*). Under a microscope camera, the pegs had the same growth ring structure as the wooden shafts of spearheads from Kikinda (Serbia) and a spearhead from another Velem-Szent Vid hoard. We can assume that the small pegs were carved out of a larger log using an analogous manufacturing technique (see further references in *Tarbay et al. 2021*).

Summary of results

Based on the metalwork production and use-wear analysis, the following conclusions can be drawn for the two studied spearheads from Velem-Szent Vid. All production-related traces on both spearheads, such as casting traces, post-casting treatment, and execution

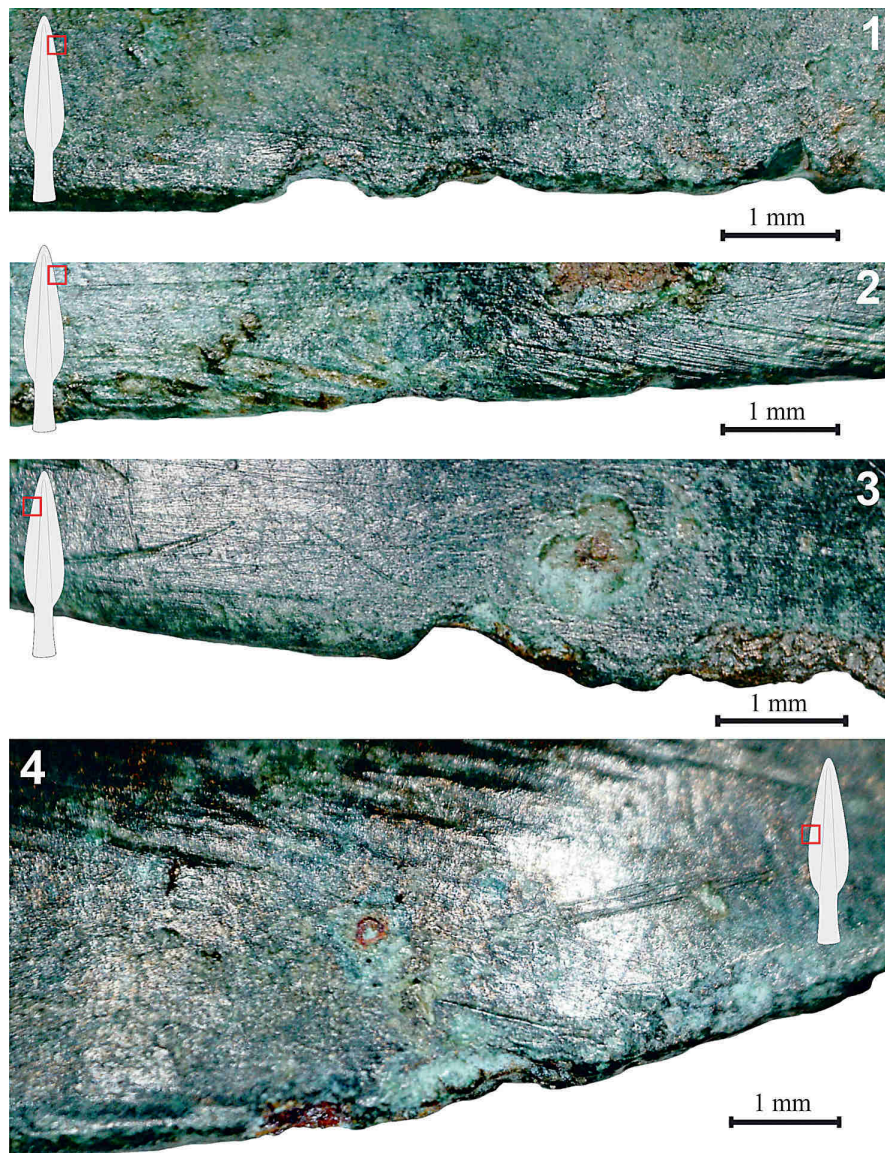


Fig. 10. Observations on spearhead no. 2: 1 – U-shaped notches and dents along the cutting edge, 2 – sharpening traces and dents, 3 – V-notch along the cutting edge, 4 – dents, hammering, and sharpening traces along the cutting edge (micrographs: J. G. Tarbay).

Obr. 10. Pozorování na hrotu kopí č. 2: 1 – vroubky ve tvaru U a záseky podél ostří, 2 – stopy ostření a záseky, 3 – vroubky ve tvaru V podél ostří, 4 – záseky, stopy kladiva a ostření podél ostří (mikroskopové snímky: J. G. Tarbay).

of chased patterns, support the hypothesis that they were made by professional craftsmen. Both objects can be classified as finished products deposited in intact condition. Both have been used, no. 1 perhaps for a longer period according to abrasion traces.

Two spears

The spearheads were deposited at the Velem-Szent Vid hillfort, which is a multi-hoard site where numerous different types of hoards have been found during the last two centuries. This deposition pattern includes mega-hoards containing hundreds of objects (Velem-Szent Vid 1A-B), a golden assemblage ('ornate' hoard), and small hoards consisting of a few artefacts (*Miske 1907; Fekete 2008; Ilon 2015*). The spearhead assemblage represents another category of hoards that are comprised exclusively of weapons.

Based on the excavation journal of the Hungarian-French research team, we assume that the two spearheads may have been inserted into the floor of a house. Its geographically closest analogy is the small ornament set hoard from the same site (Velem-Szent Vid 4), which was excavated inside a house (*Bánda – Fekete 1978*). Results of new excavations in Hungary revealed numerous cases when hoards were deposited inside or in association with settled areas and even built structures such as houses (*Müller 2006, fig. 4; V. Szabó 2019, 118–128*). The deposition of these finds does not necessarily imply a profane line of thought. Their presence may have been associated with the erection of a new house (*Trebsche 2008, 73*) or they may have been placed inside after the house was intentionally destructed or deserted. They could also be put on display as trophies of prized possessions, or they may have been accumulated together with other metal objects as a stock for recycling or recovering for special purposes (*Fekete 2009; Szabó 2019, 126–128*). Buildings are also representations of people, families, small communities, and relationships. Even long after their abandonment, they can remain important places of memory. The deposition of objects in such a building or ruins may have been an element of ritual activities connected to the life cycles of local inhabitants and communities. These places which symbolize home, stability, and family could also be particularly important sites of remembrance.

The arrangement of the two spearheads is an important aspect that should be discussed from different perspectives. Although this hoard was not recovered again, its deposition may not have been intended to be permanent (*Geißlinger 1984; 2002*). If these weapons were not left accidentally in a collapsed house, then the two weapons were in a visible place inside the house or in the vicinity of houses, always at hand. The metal parts of both spearheads remained intact and with a little maintenance work on their cutting edges, they could be completely functional. The two weapons may have been deposited in a hafted state as one of them still had the remains of the wooden shaft with pegs. Depositing the weapons consisted of two actions, two thrusts with great force, driving them into the ground or house floor next to each other, supposedly in a more or less vertical position. This is not an ordinary practice, nor is it the proper way of handling and storing professionally made weapons.

Bladed weapons are usually kept in various kinds of covering or sheaths that protect the sharpened cutting edge from unintentional damage. Fine examples are the swords, which were kept in wooden sheaths with metal fittings (see *Mörtz 2012*). Late Bronze Age examples are also known for keeping metalwork in wooden boxes (e.g., Migennes 'Le Petit Moulin'; Kopaniewo; *Kuśnierz 1998, 61; Roscio et al. 2011, figs. 3–4, fig. 10*). One can assume that the blades of the spearheads were protected by fur, textile, or leather covers; they could be also kept in boxes or buckets with their metal tips facing upwards. Different kinds of 'sauroters' (spear shoes) at the lower end of the spearheads' shaft can also help to simply lean them against the house wall (*Bader 2009, 140–141*). A combination of a stylistically similar spearhead to no. 1 with sauroters is known from the München-Widen-

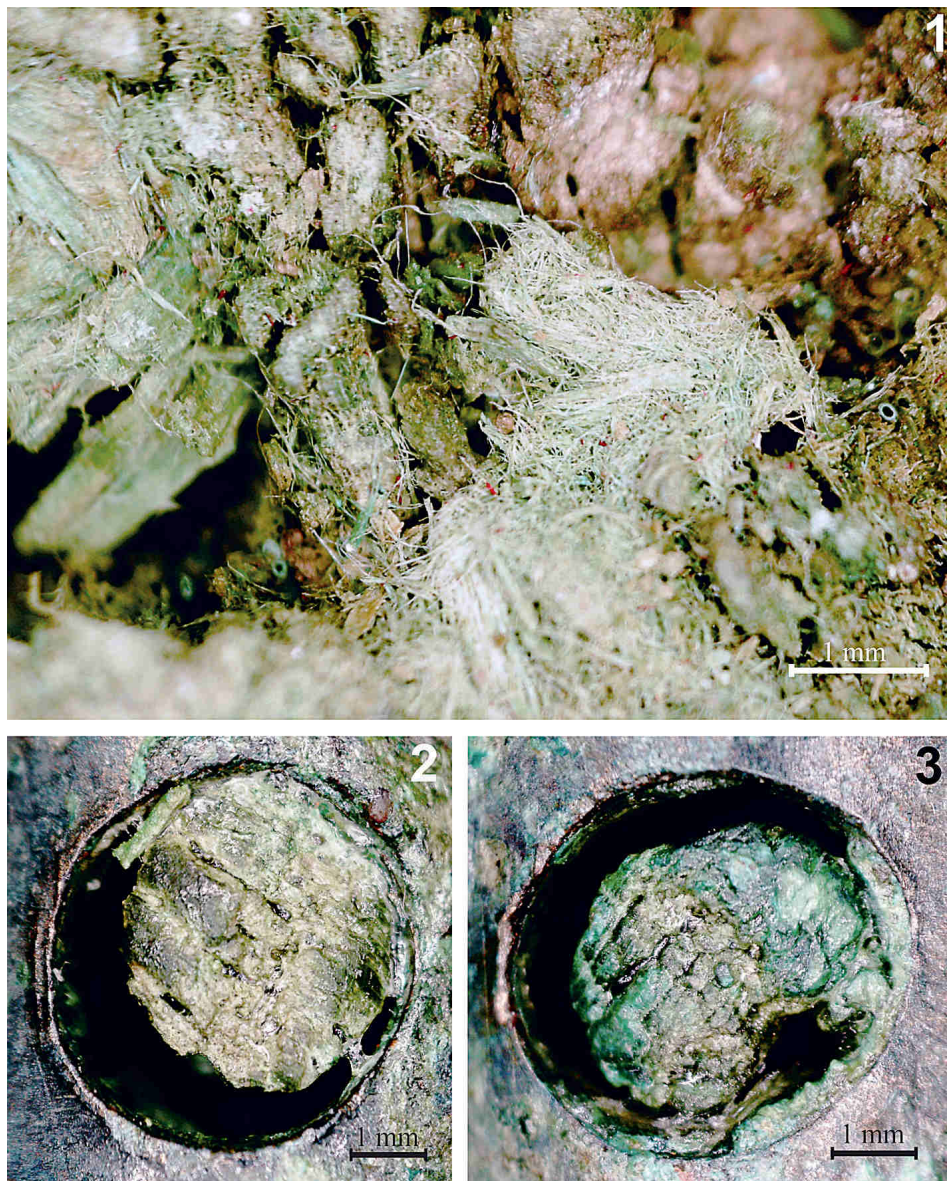


Fig. 11. Observations on spearhead no. 2: 1 – an image of the broken wooden shaft inside the spearhead's socket, 2 and 3 – images of wooden pegs along the narrow side of the spearhead's socket (micrographs: J. G. Tarbay).

Obr. 11. Pozorování na hrotu kopí č. 2: 1 – snímek zlomeného dřevěného ratiště uvnitř tuleje kopí, 2 a 3 – snímky dřevěných čepů zachovaných při užší straně tuleje (mikroskopové snímky J. G. Tarbay).

mayerstraße hoard (Müller-Karpe 1961, pl. 47A: 1–4, 8, 11). An excavation at the site of Tarsdorf is also important to mention. Here, two urns and one cremation grave were discovered. In their close vicinity, Austrian archaeologists found a cluster of intentionally

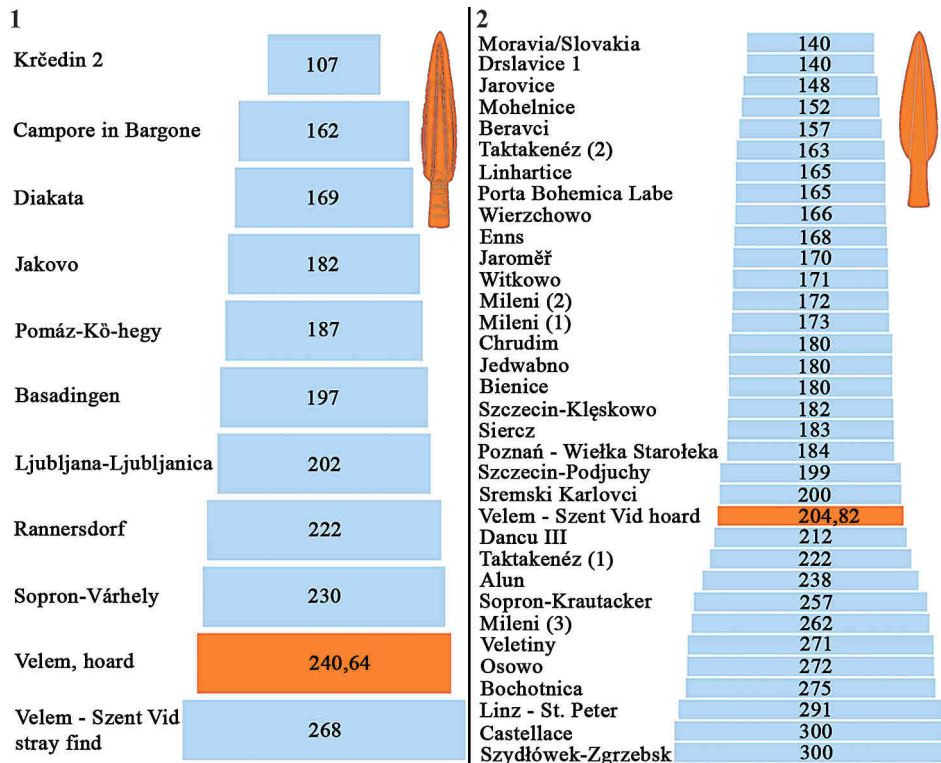


Fig. 12. Comparison of the length (mm) of the spearheads' intact parallels (data obtained from *Vinski-Gasparini 1973; Bianco Peroni 1974; Avila 1983; zu Erbach 1985; Řihovský 1996; Mozsolics 2000; Tarot 2000; Dergačev 2002; Crăciunescu 2005; Salaš 2005; Kytlicová 2007; Gedl 2008; Bruno 2012; Vasić 2015; Reiter – Linke 2016; Tarbay 2022*).

Obr. 12. Porovnání délek (mm) celkově zachovaných analogických nálezů hrotů kopí.

deposited weapons in a gravel-filled ditch ('Schotterband') that have a direct or indirect connection with these burials. Two of them were a spearhead and a spear shoe next to each other in a vertical position. This is not normal storage either; the spearhead and its shoe are intentionally separated but inserted into the ground as a set (*Schumann 2017*, 147–148, figs. 3–4).

Weapon arrangement and its significance for ritual practices within the European context were discussed by *Soroceanu (2011b)*. According to his classification, the spearhead hoard from Velem-Szent Vid can be best compared to sword hoards consisting of a paired sword deposited in a 'vertical or oblique position, with the point down' (*Vachta 2008*, 48–58, fig. 36; *Soroceanu 2011b*). A fine example of this phenomenon is the sword hoard from Orosháza-Gyopárosfürdő, where two swords were found at Gyopárosi-tó (Lake Gyopáros) being inserted into the ground with their points down as well (*Tarbay 2016*). In comparison to several examples of horizontally deposited spearheads (*Salaš 2005*, figs. 102–103, fig. 105; *V. Szabó 2019*, figs. 45–46; *Tarbay 2022*, fig. 1: 14), there are few examples of vertically deposited ones from hoard and burial contexts (*Soroceanu 1995*, 40; *2011b*, fig. 6). Recent example comes from the hoard of Ecseg-Bogdány-dűlő (Hoard II) which

was allegedly deposited in a pit. A long spearhead was embedded vertically in the top of the hoard. In this case, the wooden shaft was also preserved. The deposition of the weapon may relate to the final act of hoarding, a symbolic marking of the hoard's place. Like the two spearheads from Velem, the socket rim of the Ecseg spearhead was also close to the present surface (V. Szabó 2019, 59, fig. 41).

The spearhead hoard from Velem-Szent Vid can also be classified as a 'dual hoard'. According to Soroceanu (2011a), there are different manifestations of this phenomenon: 1) deposition of hoards in close proximity to each other (from a few centimetres to 3 km apart) or in conjunction with each other; 2) depositions of two parts of a single object; 3) the typological duality of a hoard, 4) bimetallism, 5) theriomorphic and anthropomorphic representations. He proposed that duality in hoards is a highly symbolic system reflecting complementary and contrasting points, which can be ritually interpreted. These phenomena are traces of ritual acts and plausible expressions of symbolic thinking during the hoarding act.

As mentioned, the hoarding of two spearheads like in the case of Velem-Szent Vid is rare. However, the selection of two is recorded in different types of hoards between the Br C2/D and Ha B3 periods in areas related to the Carpathian Basin, like the territories of the Czech Republic, Slovakia, Austria, Hungary, Serbia, northern Croatia, Slovenia, Bosnia and Herzegovina, Transcarpathia (West Ukraine), and Romania (see with references in Tarbay 2023). These are hoards containing various objects, such as raw materials, ornaments, tools, and other types of weapons. No special selection pattern characterizes them. A similar selection of long spearheads can be observed in the Velem-Szent Vid Hoard 2 (Ha B2), in which an undecorated spearhead with a flame-shaped blade and a long spearhead with outline grooves were present (Mozsolics 2000, 89–90; *online supplementary material 2*). These are two similarly shaped spearheads of different sizes which were likely to be deposited intact and their damage occurred later during recovery, in the museum's collection, and during invasive sampling (Szabó 1999, 333, Fig. 6.1). Differences between the original and current condition of the objects are clear when we compare the 1907 photo plates of Miske (1907, pl. 28: 1–2) with the 2021 photography of the objects. Along their cutting edges, modern traces of blade-on-blade combat damages are observable (see *fig. 13*). The production-technological characteristics of the finds are analogous to the new hoard. The difference between the two is that these were selected for a hoard containing additional finds that appear in Ha B1/B2 hoards (Mozsolics 2000, 89–90).

Traces of use on the deposited objects indicate the events connected to the finds and the lives of their users. As examples, two smaller 'assemblages' of Tatabánya-Bánhida 1 and Eger can be mentioned (*online supplementary material 2*). In contrast to the spearheads from Velem-Szent Vid, they contained two spearheads of the same shape and size. In both cases, these objects likely came from the same foundry, but only the spearheads of Tatabánya-Bánhida 1 were probably used after manufacture and had well-maintained sharp blades. They were selected for deposition in a meaningful combination of hunting-feasting equipment, with a knife, and a flesh hook (Tarbay 2020, fig. 10: 1–2). Their owner could be of important social role: a successful hunter, a warrior who had the right to distribute prestigious meat during feasts. The spearheads from Eger were never used as they completely lack any kind of post-casting treatment except for the removal of the casting jets. They interacted only with their maker, the bronzesmith, who probably made them as votive artefacts to be a substitute for real weapons or selected them for hoarding from his or her

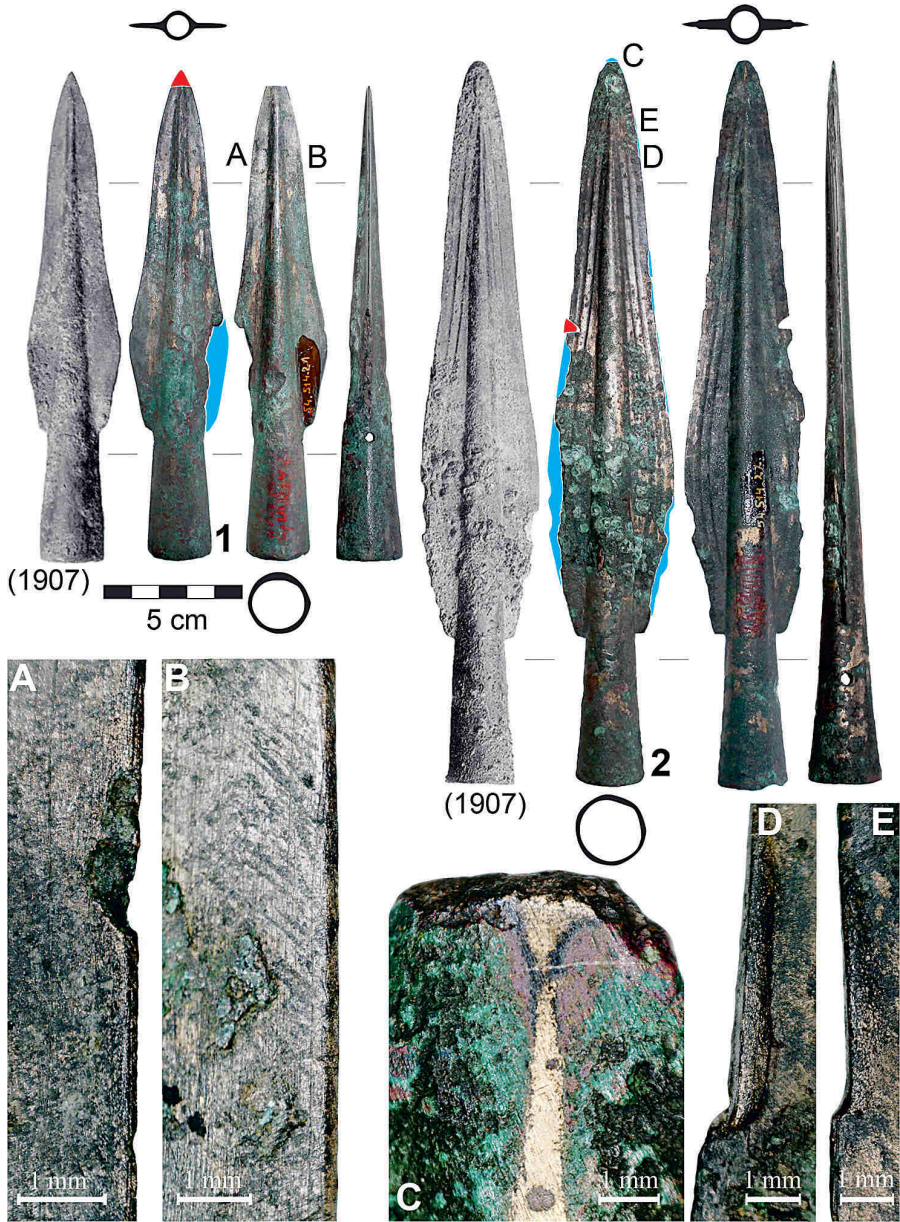


Fig. 13. Spearheads from the second hoard from Velem-Szent Vid: 1 and 2 – photos of the spearheads made in 1907 (*Miske 1907*, Pl. 28.1–2) and 2021 (photo: J. G. Tarbay), previous invasive sampling in red, damage occurred in the collection in blue, A – modern edge fragmentation, B – prehistoric sharpening traces, C – modern tip damage, D and E – modern combat damages (*online supplementary material 2: 1.2*, Savaria Museum, micrographs: J. G. Tarbay).

Obr. 13. Hroty kopí z druhého depotu z Velem-Szent Vid: 1 a 2 – fotografie hrotů kopí pořízené v roce 1907 (*Miske 1907*, Pl. 28.1–2) a 2021 (foto: J. G. Tarbay), červeně dřívější invazivní vzorkování, modře poškození vzniklá ve sbírce, A – recentní roztržení ostří, B – pravěké stopy ostření, C – recentní poškození špičky, D a E – recentní bojová poškození (*online příloha 2: 1.2*, Savaria Museum, mikroskopové snímky J. G. Tarabay).



Fig. 14. Spearheads from the Eger 'hoard' (*online supplementary material 2: 1.3*, Hungarian National Museum, photo: J. G. Tarbay).

Obr. 14. Hroty kopí z „depotu“ z Eger (*online příloha 2: 1.3*, Maďarské národní muzeum, foto: J. G. Tarbay).

stock of products that waited for further manufacturing (*fig. 14; Kemenczei 1996, 232, pl. 5: 9–11*).

Use-wear analysis of the objects from the Velem-Szent Vid hoard suggests that both spearheads were combat weapons. Thus, their owners were real warriors engaged in combat, perhaps even for a longer period, as the intense abrasion on the no. 1 spearhead suggests. This is also an exceptionally well-made object with distinct decoration that is related to the Alpine style. As such, it probably features a specific biography with accumulated additional meaning during its long use-life and its owner derived great prestige from its possession (*Pearce 2013*). Despite its relatively common form, the second spearhead is no less important. It preserved the wooden shaft and wooden pegs, the latter of which is unparalleled in the Hungarian Late Bronze Age weapon find material. The last combat damage of this weapon was not repaired before deposition. Blade-on-blade contact-related

damages support the idea that it was used with analogous movements to swords and halberds. Other Hungarian, Western, and Northern European spearheads also attest to this fighting style (*Schauer 1979*, 69–75; *Anderson 2011*, 604–606; *Horn 2014*; *Tarbay 2021*, 109–110). The intensive abrasion traces that are analogous to the gripping wear marks on metal-hilted sword handles suggest that the first spearhead may have been used in the same manner. As use-wear traces were not removed from the second spearhead, one can assume that some sort of armed conflict (e.g., a duel, a battle) took place prior to deposition. These violent acts may have played a role in the hoarding of the finds. The positioning of the spearheads implies a close relationship between the owners of the two weapons, which can be explained in numerous ways.

In our opinion, the two weapons may have belonged to two different persons. This assumption rests on the typological differences of the objects and the selection pattern of spearheads for local burials with weapons. In Transdanubia, two spearheads together were rarely selected for Tumulus culture and Urnfield culture burials (*Kőszegi 1988*). Other related Urnfield territories display the same pattern, where combinations with swords seem to be much more common (see *Clousing 2005*; *Knöpke 2009*). An exception is the Br D / Ha A1 burial no. 12 from Csabrendek which allegedly contained one dagger, two swords, and two spearheads. However, this assemblage was excavated at the end of the 19th century, therefore observations concerning the context may not be reliable (*Dorner 1884*, 231–232, Pl. E: 1–5). Since both spearhead types from Velem are present in the Alps and the western Carpathian Basin, it is unlikely that we are dealing with the sacrificed weapons of defeated fighters from distant regions (*fig. 14*). However, local conflict is always a possibility at the level of social organization observed in the Transdanubian Urnfield culture (*Kőszegi 1988*).

The spearhead deposit from Velem-Szent Vid may have been a possession of one or two generations of real combatants that was put on display inside the house or in a settled area. They can also be a reversible hoard – a set that was ready for use at any time but was eventually abandoned at one point. One can also interpret it as a trophy set, a reminder of successful combat, which consists of the weapons of one or two defeated enemies, also put in a visible place.

Conclusions

In the study, an unpublished spearhead hoard from the Velem-Szent Vid (Vas County, Hungary) hillfort was introduced. The typo-chronological evaluation of the finds revealed that spearhead no. 1 belongs to a group of spearheads known from the territories of present-day Hungary, Austria, Switzerland, Italy, Serbia, Slovenia, Croatia, and Greece. Stylistic parallels of its chased patterns reaching the area of Switzerland date back to the Ha B1 period. The relative chronological position of these finds can be between the Br D and Ha B1 periods. Spearhead no. 2 is a widespread form that has analogies from Hungary, Austria, Italy, Moravia, Slovakia, Poland, Serbia, Slovenia, Croatia, Moldova, and Romania. These spearheads with leaf-shaped blades were produced between the Br D2 and Ha B3 periods in the area of eastern Central Europe. Therefore, we assume that the spearheads from Velem-Szent Vid were manufactured in the Ha A–B1 periods, and probably deposited during the latter (Ha B1) since most hoards recovered from the site are dated to this period or later.

Our use-wear analysis of the finds led us to conclude that both were finished products based on characteristic production-technological traces like sharpening, the hammering of the cutting edges, removal of casting seams, and fine grinding. Inside the no. 2 spearhead, even a bit of the wooden shaft and the two wooden pegs were preserved. Spearhead no. 1 showed traces of intensive abrasion, which is analogous to the abrasion of metal-hilted swords' handles caused by gripping for a long period. The spearhead no. 2. also bore characteristic traces of use in the form of small edge damages caused by blade-on-blade contact. In our opinion, both damages can be related to slashing movements. As a result, these spearheads could have been used similarly to short swords or halberds, as seen in other Hungarian and western Central European finds.

The spearhead hoard from Velem-Szent Vid belongs to the category of dual hoards, as it consists of two weapons inserted into the ground during the final depositional act. The best analogy of this practice is offered by double sword hoards in the Carpathian Basin. Use-wear data suggest that the owners of these weapons were real combatants, and violent acts like war campaigns or duels may have preceded their deposition. Based on the currently available data, the assemblage can be interpreted in various ways. The spearheads, probably in a hafted state, could be put on display inside the house or in a settled area. They can form a reversible hoard, a set that was ready for use at any time but was finally abandoned at a single point. One can also interpret it as a trophy set of weapons from defeated enemies, a reminder of a glorious battle.

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