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The Casting Mould and the Wetland Find

New Data on the Late Bronze Age Peschiera Daggers

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Abstract

This study discusses an unprovenanced dagger mould from the collection of the MoD IMMH[1] and a new bronze dagger found in Tahitótfalu-Szentendre Island. Both artefacts belong to the group of Peschiera daggers, which were the most characteristic in Europe between the Br D–Ha A1 periods. Besides analysing these finds, some notes were also made on the manufacturing technology and use-life of the Peschiera-type moulds and daggers in the Late Bronze Age from the Carpathian Basin.

Introduction

The study discusses an unprovenanced Peschiera dagger mould from the collection of the Ministry of Defence, Institute and Museum of Military History (MoD IMMH) *(Figs 1–2)* and a bronze dagger of the same type *(Fig. 3.a)*, which was donated to the Prehistoric Collection of the Hungarian National Museum (HNM) by Edit Koltai. This artefact was found in 2019. According to the finder, the object was accidentally found on the bank of the Danube River. The exact find spot of the dagger spot is situated between the borders of the present day Kisoroszi and Tahitótfalu (Hungary, Pest County) in the northern part of Szentendre Island. Since the site administratively belongs to Tahitótfalu, it should be named as Tahitótfalu-Szentendre Island *(Fig. 3.b)*. The aim of this study is to provide a brief review on these above-mentioned two artefacts.

Description of the finds[2]

1. Unprovenanced dagger casting mould (MoD IMMH, Budapest, Inv. No. 2016.88.1): Stone[3] casting mould of a flange-hilted dagger. The object is cuboid, showing irregularities due to breakage and superficial manufacturing. On the longer narrow sides and the backside, bladed tool marks are visible *(Fig. 1.b–d, Fig. 2.1)*. Rough grinding traces can only be observed on the front side, on the bottom and the upper part *(Fig. 1.a,e, Fig. 2.2,4d)*. Modern scratches are also present on some parts *(Fig. 1.a,c,d, Fig. 2.3.b)*. The mould has three fastening holes. The negative was carved superficially to the mould *(Fig. 2.4.f)*. In some parts, the carving of the negative has V-shaped cross-section, hinting to the fact that it was made with a bladed tool's tip *(Fig. 2.4.c)*. Guiding lines for carving can also be detected near to the tang *(Fig. 2.3.a)*. The pouring cup of the negative was placed on the dagger negative's tip.

1 This article is part of a project which aims at publishing the most important prehistoric finds from the collection of the Ministry of Defence, Institute and Museum of Military History, before releasing a complete scientific catalogue. For previous studies, see Tarbay 2015; Tarbay 2018.

2 Abbreviations: L.: Length, W.: Width, Wt.: Weight, D.: Depth, Di.: Diameter, Th.: Thickness, w. s.: wider sides, n. s.: narrow sides.

3 The stone material of the object will be discussed in a separate study.

Typological features of the as-cast dagger in this mould are the following: straight tang, flat fan-shaped terminal, slightly convex shoulders, leaf-shaped blade strengthened by a midrib. The outlines of the cutting edges were also carved *(Fig. 2.4.e)*. Mould: L.: 230.5 mm, W. of the w. s.: 38.38 mm, 37.86 mm, 33.07 mm, W. of the longer n. s.: 33.80 mm, 29.89 mm, 2.7.27 mm, 32.83–30.26–27.91 mm, W. of the sorter n. s.: 35.51–28.88 mm, Wt.: 656 g. Negative: L. of the blade: 134.85 mm, L. of the hilt: 88.66 mm, W. of the hilt: 21.28 mm, 13.35 mm, 26.18 mm, W. of the blade: 21.38 mm, 23.16 mm, 10.85 mm, L. of the sprue: 10.80 mm, D. of the sprue: 3.93 mm, D. of the negative: 1.79–2.63 mm, Di. of the holes: 4.38–4.38–4.38 mm *(Figs 1–2)*.

2. Dagger from Tahitótfalu-Szentendre Island (HNM, Budapest, Uninventoried): The object originally had a bright mint green patina and a corroded surface *(Fig. 3.b)*. It is a flange-hilted dagger with two pegs, straight tang and a blade with widened upper part. The surface and the edges of the blade are worn due to wet conditions. A misrun defect is visible on the hilt. Cavities probably caused by porosity are noticeable on the surface. A breakage can be observed on the hilt's terminal, caused by the removal of the casting jet. The two pegs are hammered. L.: 211.89 mm, L. of the blade: 129.67 mm, L. of the hilt: 82.22 mm, W. of the hilt: 27.67 mm, 15.10 mm, 27.87 mm, W. of the hilt (n. s.): 7.31 mm, W. of the blade: 27.48 mm, Th. of the blade: 3.26–3.32 mm, L. of the pegs: 16.02–15.15 mm, Th. of the pegs: 3.78–3.47 mm, Wt.: 63.7 g *(Fig. 3.a–b)*.

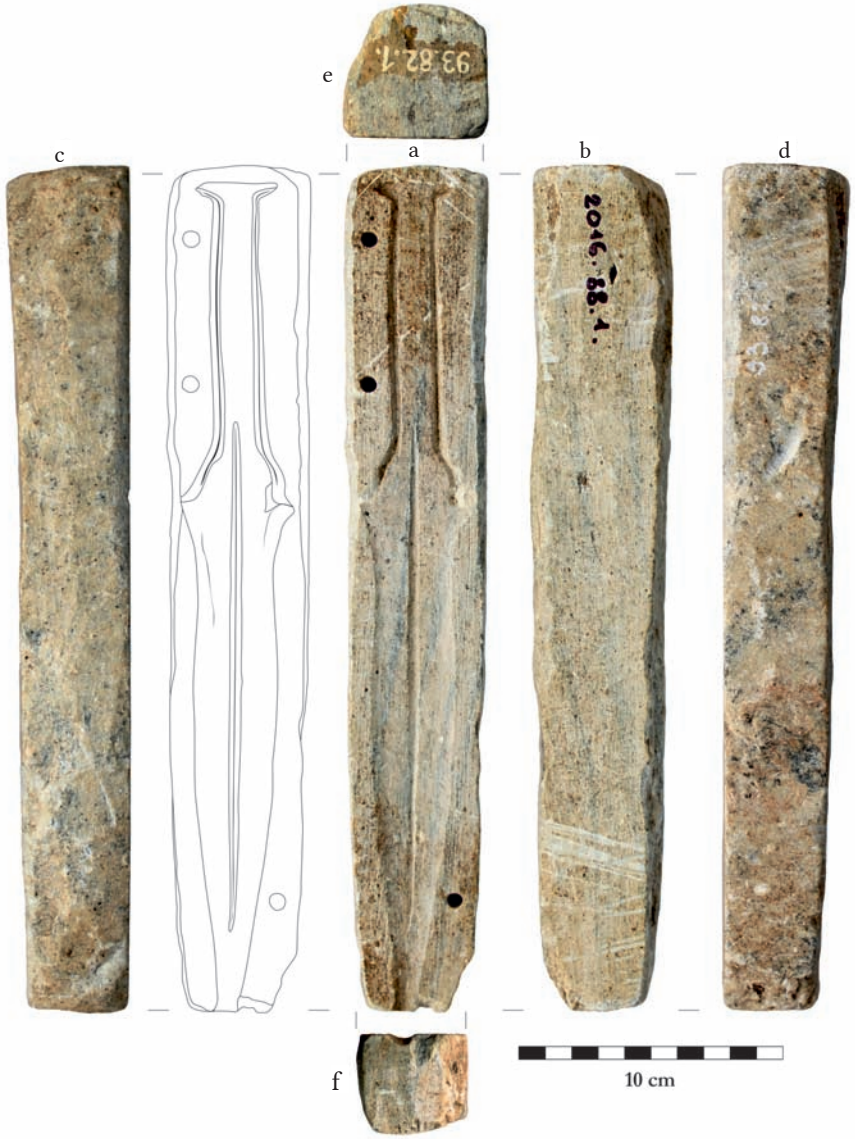

Fig. 1. a–f – Unprovenanced Peschiera dagger mould from the Collection of the MoD Institute and Museum of Military History, Budapest (Photos: J. G. Tarbay).

Fig. 2. Macroscopic observations on the mould. 1 – bladed tool marks, 2 – grinding marks, 3.a – carved guiding lines of the negative, 3.b – modern scratches, 4.c – carving with V-shaped cross-section (made with a blade's tip) 4.d – rough grinding marks, 4.e – carved outlines of the cutting edge, 4.f – poorly executed pattern of the negative (Photos: J. G. Tarbay).

Macroscopic observations

The artefact from the MoD IMMH is a half part of a bivalve casting mould. Along its sides, blade impacts were observed *(Fig. 1.b–c, f, Fig. 2.1)*. These are the untreated traces of the first manufacturing phase, when the rectangular shape of the mould was carved out from an irregular stone block.[4] Usually, these marks were completely grinded from the finished moulds. Grinding marks (dense lines) are visible on this object, although they are quite rough *(Fig. 1.a, e, f)*. Fine carved lines near to the tang's negative can be observed *(Fig. 1a)*. These can be interpreted as guiding lines that helped the craftsmen to make symmetric patterns. Different tool marks are also noticeable on the mould. The flanges and the midrib have V-shaped cross section, suggesting that these were made by a pointed tool *(Fig. 2.4c)*. No traces of use were detected on the mould. Their absence do not necessary mean that the object was not used for casting at all. Its material is much more resilient than the more common sandstone moulds, which were often burnt and broke due to heat damage.[5] Consequently, heat may have left less visible macroscopic damages on this mould.

The bronze dagger from Tahitótfalu-Szentendre Island was not suitable to draw further conclusions on its manufacturing technology due to its preservation conditions. The mismatch defect on the hilt suggests that it was cast in a bivalve mould. The breakage on the terminal supports the idea that it was cast from the direction of the hilt. The presence of hammered pegs suggest that it was hafted to an organic hilt made of wood or bone.[6] The cutting edge of the weapon is still sharp, but its microscopic surface is worn due to wet conditions. The blade is considered to be quite narrow, which could be a sign of use *(Fig. 3, Fig. 5.b.14)*.

Typo-Chronology

Peschiera Daggers

Daggers are one of the most ancient elements of Bronze Age weaponry. At the end of the Middle Bronze Age and the beginning of the Late Bronze Age their functional, symbolic and ritual aspects seem to be slowly diminished as a result of the invention of swords and one-edged knives. However, between the Br D and Ha A1, their role may still have been significant for the last time. Most daggers dated to this period fall into the group of Type Peschiera, representatives of which were buried as grave goods or selected to large hoards in manipulated state. Some were even found in settlement context (for example Celldömölk-Sághegy,[7] Tăşad[8]), while others were recovered from wetland sites[9] like the dagger from Tahitótfalu-Szentendre Island. Such finds may have been intentionally deposited to river beds and lakes. In the Carpathian Basin wetland hoarding reached its peak during the Late Bronze Age, when prehistoric rivers like the Danube were the final 'resting places' of offensive weaponry (daggers, swords, spearheads) as well as prestige metal armours (for example cuirass and helmets).[10]

4 See Barbieri et al. 2015, 8–10, Fig. 8.1–4.
5 T. Bíró 1995, 53.
6 Hampel 1892, 68; Peroni 1994, Nos 1568, 1588, 1611, 1628, 1630, 1651–1652.
7 Patek 1968, 145, Pl. 35.5.
8 Kacsó 2007, 49, 158, Fig. 8.10.
9 Catalogue Egger 1891, 10, Pl. 8.63; Bakay – Kalicz – Sági 1970, 256, Site 64/11, Pl. 16.13; Gedl 1980, 64–65, Pl. 20.177, 181; Soroceanu 2011, 61, Pl. 8.63.
10 Mozsolics 1975; Gaál 2001, 41, 46; Szathmári 2005; F. Petres – Jankovits 2014.

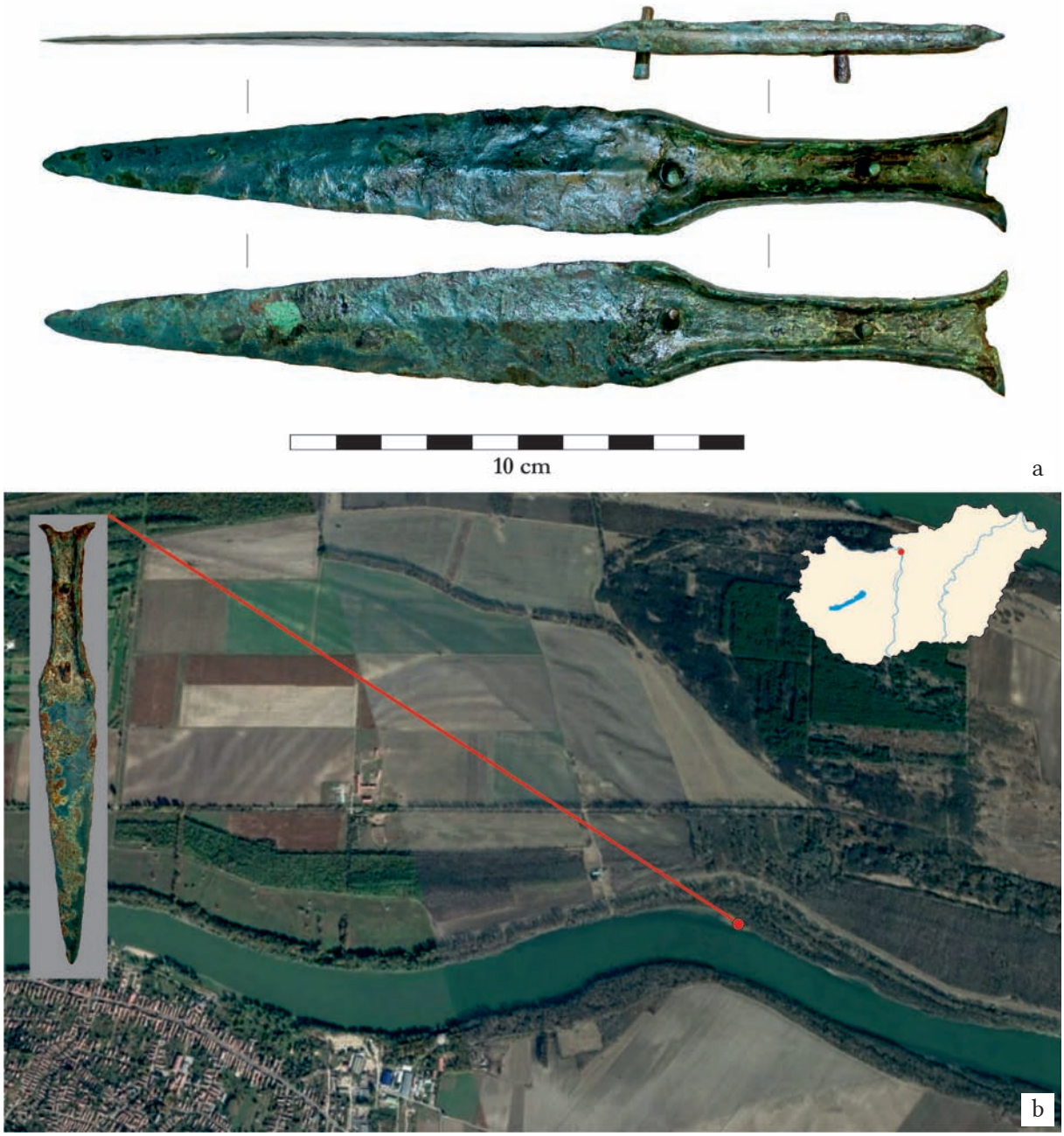

Fig. 3. The bronze dagger from Tahitótfalu-Szentendre Island. a – The object after restoration, b – The object before restoration and the find spot according to the finder (Photos: J. G. Tarbay).

In burials, daggers that followed the Peschiera style could be combined with other elements of the warrior equipment. The inhumation burial No. 12 from Csabrendek is an emblematic example. It contained a broken Peschiera dagger with swords fragments, as well as a broken and an intact spearhead.[11] Other combinations are also known. A fine example is the dagger with fan-shaped terminal from Vel'ká Lehotá (Slovakia). According to Ferencz Rakovszky, this object was found in a mound covered with stone. The excavator cut a trench and observed an approximately 0.5 m layer of slate, followed bya 0.5 m thick humus layer and finally a stone layer. After the removal of the latter, he found a 'quite large pile of bones' along with a Type

11 Dorner 1884, 231–232, Pl. E; Darnay 1899, 31, Pl. 12.12–14, 16; Kemenczei 1988, 23, Pl. 7.70.

Fig. 4. Weapon component from the Ha A1 Tab-Csabapuszta hoard. 1 – bent and broken sword, 2 – U-shaped bending of a sword fragment, 3 – broken sword tip, 4 – Type Peschiera dagger with a broken hilt, 5 – long dagger with a broken hilt (recent bending), 6 – bent and broken spearhead tip, 7 – long spearhead fragment with a crushed midrib, 8 – long spearhead without tip and a crushed socket, 9 – long spearhead with a damaged blade and a reworked tip, 10 – long spearhead with a damaged broken tip. Notches along its edges might be of modern origin (Photos: J. G. Tarbay).

Veľká Lehotá pin and 18 blue glass pearls.[12] The dagger was at the bottom of a black pot, separately in the southern edge of the tumulus, under a collapsed stonewall.[13]

Intentionally broken Peschiera daggers are frequent elements in hoards deposited in the Ha A1 period. Many of these assemblages also contain different types of manipulated weapons. A fine example is the Tab hoard (Somogy County). It was found in 1880 at Csabapuszta near Tab. The hoard was donated to the HNM by Count Zeno Welser von Welsersheimb, the Austrian Minister of Defence at that time.[14] In addition to tools and jewellery, this assemblage consisted of a local Peschiera dagger variant *(Fig. 4.4)* that was combined with a set of offensive weapons: three swords *(Fig. 4.1–3)*, a long dagger *(Fig. 4.5)* and five long spearheads *(Fig. 4.6–10)*. All weapons were finished products that showed traces of intense use, like abrasion (on the spearheads' midrib, on the ricasso, on the dagger and the sword tips), notches and worn peg holes. Excluding some modern damages,[15] these objects were originally deposited in manipulated state. The spearheads' tips were removed by breakage and bending. Some midribs and sockets were crushed by hammers. The swords' hilts were broken and their blades were bent 90 degrees or in a U-shape. The small dagger was no exception. It has an asymmetric blade and worn tip. The notches along its cutting edge also suggest that it was intensively used. The treatment of the object was similar to that of the swords, its hilt was removed by breakage. The assemblages like Tab are good examples of the fact that daggers in Transdanubia were an integral and functional part of the local Late Bronze Age weaponry. They were withdrawn from circulation probably after a long period of use along with other weapon types. The manipulation of these 'old' weapons by special techniques may also have been part of ritual practices applied for their transformation *(Fig. 5.a–b)*.

Both artefacts published here are Peschiera daggers. The first detailed analysis of this type was proposed by Renato Peroni, who distinguished 4 groups (A–D) and provided new data on these daggers' archaeological distribution and chronology.[16] His formative work has been revitalised in 1994 by Vera Bianco Peroni, who published several new finds and modified the Italian scheme.[17] In the case of Hungary, seminal works have been proposed by Amália Mozsolics.[18] A new scheme was provided by Tibor Kemenczei in the 1980s, and significant finds from the Bakony region have been discussed by Katalin Jankovits in the 1990s.[19]

According to the current state of research, the archaeological distribution of the Peschiera daggers covers the territory from the Italian Peninsula to Scandinavia and a large area between the Western fringe of the Alps and the Carpathian Basin. There are also a handful of specimens in the northern and southern part of the Balkans (Greece) as well as in the territory of Britain.[20] Peschiera daggers are considered to be characteristic between the Br D and

12 Rakovszky 1889, 389, Pl. 2.22–23; Novotná 1980, No. 706.
13 Rakovszky 1889, 388–391, Pl. 2.25.
14 Hampel 1880, 25; Hampel 1886a, 67; Hampel 1892, 20; Mozsolics 1985, 199, Pl. 116–118; Kemenczei 1988, 19, 50, 61, Pl. 5.51, Pl. 23.231, Pl. 36.328.
15 The lower part of the long dagger was probably bent by the finders, based on modern creasing traces. Damages on the cutting edge of two spears could have been recent, too.
16 Peroni 1956.
17 Peroni 1994, 149–159.
18 Mozsolics 1971, 64–66; Mozsolics 1973, 31–32; Mozsolics 1985, 18–19.
19 Kemenczei 1988, 23–27; Jankovits 1992, 237–238.
20 Hampel 1879b, 106; Reinecke 1899, 248; Sprockhoff 1936, 167–170; Milojčić 1955, 158–159; Peroni 1956, 72–73, Pl. 2–5; Müller-Karpe 1959, 91–92; Müller-Karpe 1962, 269–271; Randsborg 1968, 12–13, Fig. 5;

Ha A1 periods.[21] This weapon is undoubtedly a supra-regional phenomena, which is puzzling regarding its mechanism and temporality of distribution. In 1889, Paul Reinecke suggested that certain daggers with fan-shaped terminals, like the one from Vel'ká Lehota (Slovakia) share typological relations with Mycenaean swords. Thus, they could have been the 'northern imitations' of the Aegean objects or they can be considered as imports from territories that had direct connections with the Aegean.[22] Paul Reinecke's theory has reappeared later, based on similar arguments in the studies of several Eastern European authors.[23] Amália Mozsolics concluded that except for a few daggers, a close typological relationship between the Italian and Hungarian finds is not entirely certain. Consequently, most of the finds from the Carpathian Basin were most likely local products. This argument supports the possibility that these daggers are the result of parallel development of two metallurgical spheres.[24] The appearance of similar Peschiera daggers in the Aegean and Italy were interpreted as a sign of direct and indirect trading contact between these regions by Hartmut Matthäus.[25] Antony Harding suggested that the Greek finds are the result of Italian influence. Regarding their supra-regional distribution, he presumed that these finds were part of a metallurgical tradition that were followed by different regions.[26] A rather sceptical approach can be attributed to Svend Hansen, who pointed out the typological and chronological differences characteristic of this weapon group.[27] The analysis of Greek specimens suggested that the Peschiera daggers should be handled as 'foreign' forms made by local workshops.[28] Some interesting results were also presented from the territory of Italy. According to Anna Maria Bietti Sestieri, Claudio Giardino and Mariantonia Gorgoglione, a dagger from Scoglio del Tonno originated from the Aegean.[29] It is clear that more systematic metallurgical analyses are essential in order to shed new light on how we can interpret the distribution and manufacture of Peschiera daggers. Solely on a typological ground, I favour those ideas that support the local production and the parallel development of these weapons.

Related finds

The effect of life-cycle on typology

As we take a bronze dagger into our hands, we see an object that has undergone a number of morphological changes since it was cast. These changes which can be described in different ways from a typological point of view, were the results of several technological and usage phenomena *(Fig. 5.a–b)*. Hammering and sharpening did not only left macroscopically visible

Foltiny 1969, 43, Pl. 11.5; Harding 1973, 143–144, Fig. 2.3, Pl. 67.c; Vladár 1974, 50–51; Matthäus 1980, 122, Fig. 11; Gallay 1988, 155–156; Gedl 1980, 64; Harding 1984, 172–173; Kemenczei 1988, 27, Pl. 55a; Kőszegi 1988, 26–34, 59; Jankovits 1992, 237–238; Hansen 1994, 215–219; Wüstemann 1995, 138; Peroni 1994, 149–159; Salaš 1997, 30–32; König 2004, 28–29; Salaš 2005, 65–66; Bietti Sestieri – Macnamara 2007, 63, No. 123, Pl. 26.120–124; Kacsó 2007, 157–158; Kytlicová 2007, 105; Tankó 2010, 118, Fig. 2; Gavranović 2011, 120; Laux 2011, 20–21, Pl. 26; Филиповић 2015, 135–138; Wels-Weyrauch 2015, 119–120.

21 Milojčić 1955, 158; Peroni 1956; von Brunn 1968, 34; Randsborg 1968, 11–12; Mozsolics 1971, 64–66; Hansen 1994, 215; Kytlicová 2007, 105.

22 Rakovszky 1889, 388–390, Pl. 2.25; Reinecke 1899, 248, Pl. 9.1.

23 e.g. Paulík 1963, 310, 335; Gimbutas 1965, 82; Vladár 1974, 52; Veliačik 1983, 46.

24 Mozsolics 1973, 32.

25 Matthäus 1980, 122, 138.

26 Harding 1984, 173.

27 Hansen 1994, 215.

28 Molloy 2016, 355.

29 Bietti Sestieri – Giardino – Gorgoglione 2010, 465–466, Tab. 1

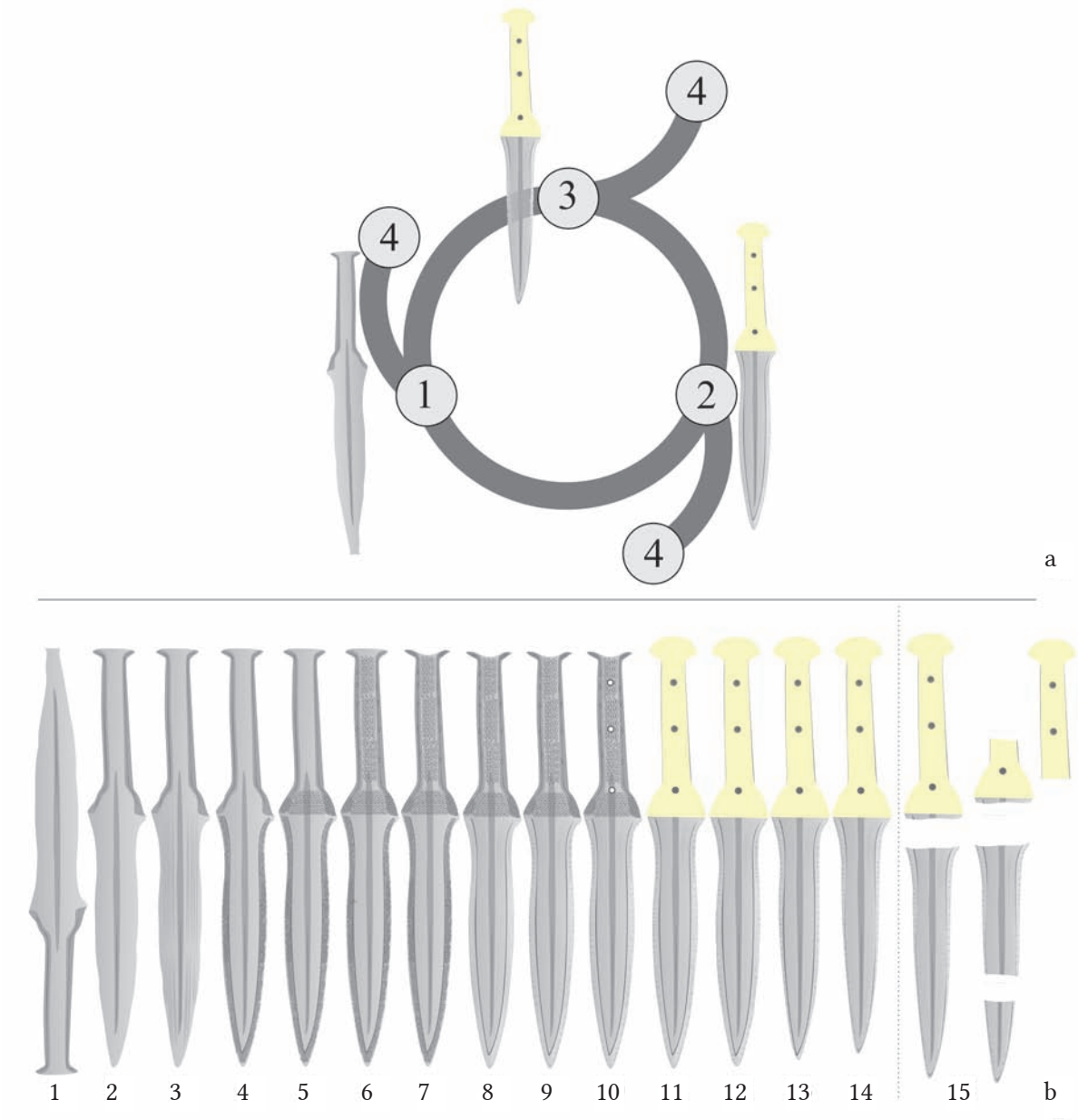

Fig. 5. a – Main prehistoric life-cycle stages of daggers. 1 – as-cast, 2 – finished product, 3 – used product, 4 – objects are taken out from circulation. b – Fine morphological changes occurring between the manufacture and deposition of daggers. 1–3 – reshaping and grinding of the as-cast, 4–7 – cold hammering and/or annealing of different parts (cutting edge, hilt), 8–9 – grinding of the blade, 10 – making of peg holes in case they have not been already cast, 11 – hafting, 12–14 – narrowing of the cutting edge due to use, maintenance and re-sharpening, 15 – Fragmentation and manipulation of used daggers (Graphic: J. G. Tarbay).

traces on the artefacts,[30] but they have also changed the shape of the as-cast blade. An improperly removed casting jet could damage the tip or the terminal, thus causing a shortening on the total length of the as-cast dagger. If the object was used intensively or for a long period of time, its cutting edge would require continuous maintenance through hammering, grinding and re-sharpening. In the end, these used daggers will have narrow and triangular-shaped blades instead of leaf-shaped ones *(Fig. 5.b.13–14)*. In addition to the specimen from Tahitót-

30 Tarbay 2017, Fig. 20.6–7.

falu-Szentendre Island, many examples are known for this phenomenon (for example Hočko Pohorje,[31] Peterd,[32] Zirc-Tündérmajor[33]). The hammering of the shoulders and application of peg-holes can also change the shape of the terminal. These were just examples for major technological factors that must be considered in a typological analysis, especially when the intention is to find parallels for a casting mould or a used dagger. This is obviously not entirely possible at the current level of research. However, the future application of this aspect will contribute to provide analyses and comparisons, which are not creating 'overcomplicated' typological classes but finer and also technologically correct style groups.

The casting mould from the MoD IMMH

Only a few dagger casting moulds are known from the Late Bronze Age Carpathian Basin, for example Oşorhei,[34] Gáborján-Földvár,[35] Radzovce[36] and Sárvár.[37] In connection to the Peschiera daggers, the most important assemblage is the mould hoard from Oşorhei, Romania (former *Fugyi Vásárhely*). One of the moulds shows the negative of a Peschiera dagger with midrib, which is somewhat similar to the mould from the MoD IMMH. The main difference between the two is that the pouring cup was placed on the negative's terminal and the mould from Oşorhei is much smaller. The context of the find is uncertain. It is most likely that this mould belonged together with some additional finds. One is a casting mould of an Eastern Carpathian style spearhead with emphasized midrib. On the other side of the object, two knobbed sickles were carved. Parallels of these finds suggest that they should be dated around the Br D–Ha A1 periods. The importance of the Oşorhei assemblage is that it implies the local Transylvanian manufacturing of these daggers.[38]

Finding a parallel for the dagger that could have been made in the mould from the MoD IMMH is not without difficulties. As it was previously pointed out in the introduction, daggers are changing during their life-cycles. Therefore, a manufactured and used dagger might have looked completely different than an as-cast, which can be reconstructed from the mould's negative. The as-cast made in the MoD IMMH mould would have been a flange-hilted dagger with convex shoulders, straight tang and a slightly leaf-shaped blade strengthened by a midrib *(Fig. 5.1–2)*. As a result of intensive use and continuous maintaining, the object's leaf-shaped blade could be shortened and became narrow. This phenomena can be observed on all parallels cited below. From Hungary, only one find shares some similarities with the dagger that would have been made in this mould. It was allegedly found in the Rába River. This object has an emphasized midrib and a straight blade. The shape of the terminal shows minor differences.[39] There is also a quite long dagger from Virje (Croatia) which seems to be matching with the discussed mould. It has a straight tang, midrib and a slightly concave interface of the hilt plate with the blade. The main difference between the two is the shape of

31 Čerce – Šinkovec 1995, Pl. 75.24.
32 Mozsolics 1985, Pl. 61.6.
33 Patek 1968, Pl. 67.3.
34 Hampel 1879a, 132–134, Fig. 2.
35 Dani 1999, 37, 39, Fig. 1.
36 Furmánek 1983, 89, 91–92, 96–97, Fig. 1. 2–5; Pančíková 2008, Figs 1–4.
37 Ilon 2015, 173, Fig. 4.2.1.
38 Hampel 1879a, 132–134, Fig. 2; Hampel 1886a, 45, Pl. 2.5; Hampel 1886b, Pl. 2.5; Hampel 1892, 42; Hoernes 1904, 205, 208, Pl. 1.2; Rákoczy 1910, 617, 619, Fig. 73; Ardoş 1936, 67; Roska 1942, 95, No. 115; Petrescu-Dîmboviţa 1978, 104–105, No. 56, Pl. 41A.2.
39 Catalogue Egger 1891, 10, Pl. 8.63; Soroceanu 2011, 61, Pl. 8.63.

the hilt's end. One of them is straight (MoD IMMH), the other is concave.[40] As a stray find, the Virje object cannot be dated.[41] Possible parallels come from several hundreds of kilometres away in Poland. One of them is also a stray find from Wrocław-Osobowice. This dagger has an emphasized midrib from the tip to the hilt plate. The upper part of the object is missing, the remaining part shows a similar construction to the MoD IMMH mould.[42] The wetland find from Drążdżewo (Poland) is also worth mentioning, this object also has a midrib and an identical hilt.[43] Among the Italian archaeological material, only stray find, a small dagger can be mentioned as parallel from Peschiera del Garda. It has a midrib and a somewhat comparable hilt design.[44] The small dagger from Karlstein, Germany is also related to this find from a stylistic point of view. It has a very similar shape regarding the design of the midrib and blade.[45] Unfortunately, most of the finds which can be associated with the dagger mould from the MoD IMMH are stray finds. Thus, it can only be dated to the Br D–Ha A1 based on the relative chronological position of the Oşorhei mould hoard. It is relatively well connected to the Transylvanian Oşorhei assemblage, which may suggest an origin from the Carpathian Basin. However, the sporadic distribution of the stylistically related bronze finds suggest that this mould follows a supra-regional design. Therefore, it is hard to associate it with a certain geographical region solely from a typological perspective. Further investigation of the stone material is essential in order to determine its provenance.

The dagger from Tahitótfalu-Szentendre Island

The dagger from Tahitótfalu-Szentendre Island has a rhomboid cross section and a straight tang, folding out in the line of the shoulders. The blade is long and narrow due to use. Several similar daggers are known from Eastern Europe, but they are hard to compare to this object since most of them are fragmented or their hilt is missing. Here, only those finds are mentioned, which can be compared well with the dagger from Tahitótfalu-Szentendre Island. Beside two unprovenanced daggers from Hungary,[46] a cemetery stray find is known from the Kéthely-Téglagyár site.[47] Close parallels can also be noted from Slovakia: for example Dolné Janíky tumulus,[48] Velatice-settlement from Ducové (Br D–Ha A1/Ha A1)[49] and a stray find from Bajč.[50] In the Czech Republic, only the dagger from Polešovice has a secure context, belonging to a Moravian Br D2 mega-hoard.[51] A comparable specimen is also known from an uncertain hoard found in Vöcklabruck, Austria.[52] The westernmost parallels can be cited from Germany (Leitheim, 'Mantlach a. d. Laaber').[53] Several Italian daggers were classified as

40 The concave shape can be resulted by the removal of the sprue, if the object was cast from the direction of the tang.
41 Ljubić 1889, 60, Pl. 8.7; Vinski-Gasparini 1973, 221, Pl. 18.7.
42 Gedl 1980, 65, Pl. 20.185.
43 Gedl 1980, 65, Pl. 20.181.
44 Peroni 1994, 147, Pl. 81.1468.
45 Wels-Weyrauch 2015, 119, Pl. 39.503.
46 Kemenczei 1988, 25, Pl. 8.93, 98.
47 Draveczky 1963, 10; Draveczky 1970, Pl. 26.198; Kemenczei 1988, 25, Pl. 8.96; Kőszegi 1988, 151, No. 573, Pl. 4.F.46.
48 Studeníková 1994, 29, Fig. 1.
49 Paulík 1970, 46, Fig. 7B.2; Vladár 1974, 51, Pl. 7.150A; Furmánek 2006, 21, No. 19.
50 Točík 1964, 82, Pl. 56.1; Vladár 1974, 51, Pl. 7.148.
51 Salaš 1997, 30–32, Pl. 20.492; Kytlicová 2007, 272–273, Pl. 68.45, 48; Novák 2011, 104, Pl. 37.510.
52 zu Erbach 1985, Pl. 85.6; zu Erbach 1986, 233; zu Erbach 1989, 87, 227.
53 Wels-Weyrauch 2015, 120, Pl. 39.508, Pl. 40.512.

different types (for example Type Tenno, Bertarina, Cascina, Merlara), but share typological similarities with the Tahitótfalu find. Most of the Italian analogies are stray finds: 'Assisi', Campegine, Castelbonafisso, 'Il Monte', Piadena.[54] Eight specimens originate from settlements such as Montale or the eponymous Peschiera del Garda and Regnano.[55] Among the Italian parallels two were found in burial context (Torre d'Andrea, Vibo Valentia).[56] The dagger from Vibo Valentia was discovered together with a Type Cetona sword. According to Vera Bianco Peroni, the finds from Vibo should be interpreted as the grave goods of a 'warrior' dated to the *Bronzo recente* (ca. 1350–1200 BC).[57] Analogues of the Tahitótfalu-Szentendre Island daggers suggest that it should be dated to Br D based on the relative chronological position of the Moravian and Italian finds. Similarly to the mould, the parallels of this dagger also show a supra-regional archaeological distribution. They share similarities with the Carpathian finds and also with some daggers west of this region.

Conclusions

Two objects were discussed in this study, one is an unprovenanced mould from the MoD IMMH and the other is a bronze dagger found recently in Tahitótfalu-Szentendre Island. Both artefacts are classic specimens of the Peschiera style daggers which can be defined as a supra-regional weapon style group manufactured and used mainly between the Br D and Ha A1. The mould from the MoD IMMH has allowed the documentation of several fine traces (guiding lines, imprecise negatives, tool marks) which can be associated with mould manufacturing. The dagger from Tahitótfalu-Szentendre Island had a less informative macroscopic surface, but its narrow blade suggests that it may have been used before its deposition. The technological phenomena observed on these finds macroscopically allowed us to make some notes on the manufacturing and usage of these weapons and on the typological problems related to their life-cycle. Based on the typo-chronological analysis, the mould from the MoD IMMH could have been made in the territory of the Carpathian Basin, but its 'foreign' origin should not be ruled out either. Its parallels can be mentioned from Hungary, Croatia, Poland, Italy and Germany. From a relative chronological point of view, this find can be connected to the metallurgical tradition of the Br D–Ha A1 periods. The dagger from Tahitótfalu-Szentendre Island can be well compared to the Western Carpathian objects and it also shares morphological similarities with the finds from Western Europe and the Italian Peninsula. A more precise relative dating (Br D) can only be given to the Tahitótfalu-Szentendre Island dagger.

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54 Peroni 1994, 153, 155, 157–158, 160, Pl. 84.1518, Pl. 85.1539, Pl. 87.1563, Pl. 88.1573–1574, 1577, Pl. 90.1600.
55 Peroni 1994, 154–156, 159–160, Pl. 84.1522, Pl. 85.1536, Pl. 86.1554, Pl. 88.1583, Pl. 89.1587–1589, Pl. 90.1605.
56 Peroni 1974, 3–4, Pl. 2.145A; Peroni 1994, 155, 159, Pl. 85.1542, Pl. 89.1592.
57 Peroni 1974, 3–4, 15, Pl. 2.145A; Peroni 1994, 157–160.

References

Ardoş, F. 1936: Date arheologice privitoare la Oradea şi Judeţul Bihor. *Familia Revista Lunara de Cultura* III/III/4 Aprile, 61–76.

Bakay, K. – Kalicz, N. – Sági, K. 1970: *Veszprém megye Régészeti Topográfiája. A devecseri és sümegi járás.* Magyarország régészeti topográfiája 3. Budapest.

Barbieri, A. M. – Cavazzuti, C. – Pellegrini, L. – Scacchetti, F. 2015: Experiencing visible and invisible metal casting techniques in the Bronze Age Italy. In: Rüdiger, K. (ed.): *Archaeology and Crafts. Experiences and Experiments on traditional Skills and Handicraft in Archaeological Open-Air Museums in Europe. Proceedings of the VI. OpenArch-Conference in Albersdorf, Germany, 23.–27. September 2013.* Albersdorfer Forschungen zur Archäologie und Umweltgeschichte 5. Husum, 94–102.

Bietti Sestieri, A. M. – Macnamara, E. 2007: *Prehistoric Metal Artefacts from Italy (3500 – 720 BC) in the British Museum.* London.

Bietti Sestieri, A. M. – Giardino, C. – Gorgoglione, M. 2010: Metal finds at the Middle and Late Bronze Age settlement of Scoglio de Tonno (Taranto, Apulia): results of archaeometallurgical analysis. *Trabajos de Prehistoria* 67/2, 457–468.

T. Bíró, K. 1995: Lithic implements of Gór, NW Hungary; evidence of stone casting moulds production: preliminary results. In: Maniatis, Y. – Herz, N. – Basiakos, Y. (eds): *The Study of Marble and other Stones used in Antiquity. Amosia III Athens: Transactions of the 3rd International Symposium of the Association for the Study of Marble and Other Stones used in Antiquity.* London. 51–56.

von Brunn, W. A. 1968: *Mitteldeutsche Hortfunde der jüngeren Bronzezeit.* Römisch-Germanische Forschungen 29. Berlin.

Catalogue Egger 1891: *Catalogue of Important Collection of Bronze Arms & Implements, and Ornaments in Gold, Silver & Bronze formed by the late Dr. S. Egger, of Vienna.* London.

Čerce, P. – Šinkovec, I. 1995: Katalog depojev pozne bronaste dobe – Catalogue of Hoards of the Urnfield Culture. In: B. Teržan (ed.): *Depojske in posamezne kovinske najdbe bakrene in bronaste dobe na Slovenskem – Hoards and Individual Metal Finds from the Eneolithic and Bronze Ages in Slovenia* I. Katalogi in monografije – Catalogi et monographie 29. Ljubljana, 129–232.

Dani, J. 1999: Gáborján-Földváron előkerült tőr öntőforma. *Ősrégészeti Levelek – Prehistoric Newsletters* 1/1, 37–39.

Darnay, K. 1899: Sümegh és vidékének őskora. *Archaeologiai Közlemények* 22, 5–85.

Dorner, K. 1884: Csab-Rendeki ásatás. *Archaeologiai Értesítő* 4, 227–232.

Draveczky, B. 1963: Kéthely-Téglagyár agyagbánya. *Régészeti Füzetek* 16, 10.

Draveczky, B. 1970: *Somogy megye régészeti képeskönyve.* Somogyi Múzeum 17. Kaposvár.

zu Erbach, M. 1985: *Die spätbronze- und urnenfelderzeitlichen Funde aus Linz und Oberösterreich.* Linzer Archäologische Forschungen 14. Linz.

zu Erbach, M. 1986: *Die spätbronze- und urnenfelderzeitlichen Funde aus Linz und Oberösterreich.* Linzer Archäologische Forschungen 15. Linz.

zu Erbach, M. 1989: *Die spätbronze- und urnenfelderzeitlichen Funde aus Linz und Oberösterreich.* Linzer Archäologische Forschungen 17. Linz.

Филиповић, В. М. 2015: *Наоружање и ратничка опрема у културама позног бронзаног и старијег гвозденог доба на територији Србије, Македоније, Црне Горе и Албаније (Weapons and Warrior Equipment in the Cultures of the Late Bronze and Early Iron Age on the Territories of Serbia, Macedonia, Montenegro and Albania).* Belgrad.

Foltiny, St. 1969: *The Hungarian Archaeological Collection of the American Museum of Natural History in New York.* Corpus Antiquitatum Hungaricarum in America 1. Indiana University Publications Uralic and Altaic Series, Volume 77. Bloomington.

Furmánek, V. 1983: Odlévací formy ze sídliště piliňské kultury v Radzovcích (Gussformen aus der Siedlung der Pilinyer Kultur in Radzovce). *Študijné Zvesti Archeologického Ústavu Slovenskej Akadémie Vied* 20, 87–97.

Furmánek, V. 2006: Teil 1: Die Knopfsicheln und die Sichelgussformen in der Slowakei. In: Furmánek, V. – Novotná, M.: *Die Sicheln in der Slowakei.* Prähistorische Bronzefunde XVIII/6. Stuttgart.

Gaál, A. 2001: Posamenteriefibel mit Fusspirale, Bronzebecken und Bronzehelm aus dem Donauabschnitt im Komtitat Tolna. *Communicationes Archaeologicae Hungariae*, 41–50.

Gallay, G. 1988: *Die mittel- und spätbronze- sowie älter- eisenzeitlichen Bronzedolche in Frankreich und auf den britischen Kanalinseln.* Prähistorische Bronzefunde VI/7. München.

Gavranović, M. 2011: *Das Spätbronze-und Früheisenzeit in Bosnien. Teil I – Text.* Universitätsforschungen zur prähistorischen Archäologie 195. Bonn.

Gedl, M. 1980: *Die Dolche und Stabdolche in Polen.* Prähistorische Bronzefunde VI/44. München.

Gimbutas, M. 1965: *Bronze Age Cultures in Central and Eastern Europe.* Paris–London.

Hampel, J. 1879a: Magyarhoni őskori leletek a bécsi csász. kir. régiséggyűjteményben. *Archaeologiai Értesítő* 13, 129–137.

Hampel, J. 1879b: Pilini lelet. *Archaeologiai Értesítő* 13, 103–108.

Hampel, J. 1880: A n. múzeum érem- és régiségosztályának gyarapodása a f. évi julius-novemberi hónapokban. *Archaeologiai Értesítő* 14, 340–358.

Hampel, J. 1886a: *Trouvailles de l'Âge de Bronze en Hongrie.* Budapest.

Hampel, J. 1886b: *A bronzkor emlékei Magyarhonban. I. Rész: Képes Atlasz.* Budapest.

Hampel, J. 1892: *A bronzkor emlékei Magyarhonban II. Rész: A Leletek Statisztikája.* Budapest.

Hansen, S. 1994: *Studien zu den Metalldeponierungen während der älteren Urnenfelderzeit zwischen Rhônetal und Karpatenbecken. Teil 1–2.* Universitätsforschungen zur prähistorischen Archäologie 21. Bonn.

Harding, A. 1973: Prehistoric bronzes in the Department of Prehistoric and Romano-British Antiquities. *British Museum Quarterly* 37, 140–143.

Harding, A. 1984: *The Mycenaeans and Europe.* London.

Hoernes, M. 1904: Őskori és római leletek Magyarországból a Bécsi Udvari Természetrajzi Múzeumban. *Archaeologiai Értesítő* 24, 204–211.

Ilon, G. 2015: Bronzkori szúrófegyverek Vas megyei gyűjtők tulajdonában (Thrusting weapons dating to the Bronze Age in the property of private collectors in Vas County). In: Csabai, Z. – Ernő, Sz. – Vilmos, L. – Vitári-Wéber, A. (eds): *Európé égisze alatt. Ünnepi tanulmányok Fekete Mária hatvanötödik születésnapjára kollégáitól, barátaitól és tanítványaitól.* Pécs–Budapest, 171–186.

Jankovits, K. 1992: Spätbronzezeitliche Hügelgräber von Bakonyjákó. *Acta Archaeologica Academiae Scientiarum Hungaricae* 44, 261–343.

Kacsó, C. 2007: *Descoperiri de bronzuri din Nordul Transilvaniei (I). Colecţia Ferenc Floth.* Studii şi Cercetări Maramureşene 2. Baia Mare.

Kemenczei, T. 1988: *Die Schwerter in Ungarn I (Griffplatten-, Griffangel- und Griffzungenschwerter).* Prähistorische Bronzefunde IV/6. München.

König, P. 2004: *Spätbronzezeitliche Hortfunde aus Bosnien und Herzegowina.* Prähistorische Bronzefunde XX/11. Stuttgart.

Kőszegi, F. 1988: *A Dunántúl története a késő-bronzkorban – The History of Transdanubia during the Late Bronze Age.* BTM Műhely – BTM Scientific Workshop 1. Budapest.

Kytlicová, O. 2007: *Jungbronzezeitliche Hortfunde in Böhmen.* Prähistorische Bronzefunde XX/12. Stuttgart.

Laux, F. 2011: *Die Dolche in Niedersachsen.* Prähistorische Bronzefunde VI/14. Stuttgart.

Ljubić, F. 1889: *Popis arkeologičkoga odjela nar. zem. muzeja u Zagrebu. Odsjek* I. Zagreb.

Matthäus, H. 1980: Italien und Griechenland in der Ausgehenden Bronzezeit. Studien zu einigen Formen der Metallindustrie beider Gebiete. *Jahrbuch des Deutschen Archäologischen Instituts* 95, 109–139.

Milojčić, V. 1955: Einige "mitteleuropäische" Fremdlinge auf Kreta. *Jahrbuch des Römisch Germanischen Zentralmuseums Mainz* 2, 153–169.

Molloy, B. P. C. 2016: Nought may Endure but Mutability: Eclectic Encounters and Material Change in the 13th to 11th Centuries BC Aegean. In: Molloy, B. P. C. (ed.): *Of Odysseys and Oddities. Scales and modes of interaction between prehistoric Aegean societies and their neighbours.* Sheffield Studies in Aegean Archaeology. Oxford–Philadelphia, 343–383.

Mozsolics, A. 1971: Some remarks on 'Peschiera' bronzes in Hungary. In: Boardman, J. – Brown, M. A. (eds): *The European Community in Later Prehistory. Studies in honour of C. F. C. Hawkes.* London, 59–76.

Mozsolics, A. 1973: *Bronze- und Goldfunde des Karpatenbeckens. Depotfundhorizonte von Forró und* Ópályi. Budapest.

Mozsolics, A. 1975: Bronzkori kardok folyókból (Bronzezeitliche Schwertfunde aus Flüssen). *Archaeologiai Értesítő* 102, 3–24.

Mozsolics, A. 1985: *Bronzefunde aus Ungarn. Depotfundhorizonte von Aranyos, Kurd und Gyermely.* Budapest.

Müller-Karpe, H. 1959: *Beiträge zur Chronologie der Urnenfelderzeit nördlich und südlich der Alpen.* Römisch-Germanische Forschungen 22. Berlin.

Müller-Karpe, H. 1962: Zur spätbronzezeitliche Bewaffnung in Mitteleuropa und Griechenland. *Germania* 40, 255–287.

Novák, P. 2011: *Die Schwerter in der Tschechoslowakei I.* Prähistorische Bronzefunde IV/4. München.

Novotná, M. 1980: *Die Nadeln in der Slowakei.* Prähistorische Bronzefunde XIII/6. München.

Patek 1968: *Die Urnenfelderkultur in Transdanubien.* Archaeologia Hungarica 44. Budapest.

Paulík, J. 1963: K problematike čakanskej kultúry v Karpatskej kotline (Zur Problematik der Čaka-Kultur im Karpatenbecken). *Slovenská Archeológia* 11/2, 269–338.

Paulík, J. 1970: Panzer der jüngeren Bronzezeit aus der Slowakei. *Bericht der Römisch-Germanischen Kommission* 49, 41–61.

Pančíková, Z. 2008: Metalurgia v období popolnicových polí na Slovensku (Urnenfelderzeitliche Metallurgie in der Slowakei). *Památky Archeologické* 99, 93–160.

Peroni, R. 1956: Zur Gruppierung mitteleuropäischer Griffzungendolche der späten Bronzezeit. *Badische Fundberichte* 20, 69–92.

Peroni, V. B. 1974: Neue Schwerter aus Italien. Altre spade dall'Italia Continentale. In: Müller-Karpe, H. (ed.): *Beiträge zu italienischen und griechischen Bronzefunden.* Prähistorische Bronzefunde XX/1. München, 1–26.

Peroni, V. B. 1994: *I pugnali nell'Italia Continentale.* Prähistorische Bronzefunde VI/10. Stuttgart.

F. Petres, É. – Jankovits, K. 2014: Der spätbronzezeitliche zweiteilige Bronzebrustpanzer aus der Donau in Ungarn. *Acta Archaeologica Academiae Scientiarum Hungaricae* 65, 43–71.

Petrescu-Dîmboviţa, M. 1978: *Die Sicheln in Rumänien mit Corpus der jung- und spätbronzezeitlichen Horte Rumäniens.* Prähistorische Bronzefunde XVIII/1. München.

Rakovszky, F. 1889: Nyitramegyei *ásatásaim* eredménye. *Archaeologiai Értesítő* 8, 385–390.

Randsborg, K. 1968: Von Periode II zu III. Chronologische Studien über die ältere Bronzezeit Südskandinaviens und Norddeutschland. *Acta Archaeologica København* 39, 1–142.

Rákoczy, S. 1910: A bányászat multja a magyar birodalom földjén. *Bányászati és Kohászati Lapok* 43/1/10, 596–632.

Reinecke, P. 1899: Tanulmányok a magyarországi bronzkor chronologiájáról. (Első közlemény). *Archaeologiai Értesítő* 19, 225–251.

Roska, M. 1942: *Thesaurus Antiquitatum Transsylvanicarum I. Praehistorica (Erdély Régészeti Repertóriuma)* I. Őskor. Kolozsvár.

Salaš, M. 1997: *Der urnenfelderzeitliche Hortfund von Polešovice und die Frage der Stellung der Depotfundhorizonts Drslavice in Mähren.* Brno.

Salaš, M. 2005: *Bronzové depoty střední az pozdní doby bronzové na Moravě a ve Slezsku (Hügelgräberbronze und urnenfelderzeitliche Metalldepots in Mähren).* Brno.

Soroceanu, T. 2011: Restitutiones bibliographicae et archaeologicae ad res praehistoricas pertinentes. II. Colecţia dr. Samuel Egger din Viena (Restitutiones bibliographicae et archaeologicae ad res praehistoricas pertinentes. II. Die Sammlung Dr. Samuel Egger aus Wien). *Marmatia* 10/1 Arheologie, 53–108.

Sprockhoff, E. 1936: Ein Peschieradolch aus Niedersachsen. *Germania* 20, 166–170.

Studeníková, E. 1994: Burial Mounds of the Bronze Age in Janíky. In: Maráky, P. (ed.): *The Bronze Age in Slovakia. Historical Monuments and Museums.* The Cultural Heritage Review. Bratislava, 29.

Szathmári, I. 2005: Folyókból előkerült bronzkori kardleletek a Magyar Nemzeti Múzeum gyűjteményében (Bronzezeitliche Schwertfunde aus Flüssen in der Sammlung des Ungarischen Nationalmuseums). *Communicationes Archaeologicae Hungariae,* 143–166.

Tankó, É. 2010: Tőrök, borotvák és sarlók a Pilinyi-kultúra nagybátonyi urnatemetőjéből (Dolche, Rasiermesser und Sichel aus dem Urnengräberfeld der Pilinyer Kultur in Nagybátony). In: Guba, Sz. – Tankó, K. (Szerk.): *"Régről kell kezdenünk…". Studia Archaeologica in honorem Pauli Patay – Régészeti tanulmányok Patay Pál tiszteletére.* Szécsény, 115–124.

Tarbay, J. G. 2015: A new Late Bronze Age warrior equipment from East Central Europe (Új késő bronzkori, kelet-közép-európai harcosfelszerelés). *Archaeologiai Értesítő* 140, 29–70.

Tarbay, J. G. 2017: The Late Bronze Age Hoard from Oltárc Márki Hill – Analysis of prehistoric manipulations, selective fragmentation and non-ritual violence (Késő bronzkori depó Oltárc-Márki hegyről. Őskori manipulációk, szelektív és recens törések vizsgálata). *Zalai Múzeum* 23, 73–138.

Tarbay, J. G. 2018: Moulds for Large Daggers. Unique Finds from the Bronze Age Hatvan-Strázsa-hegy Tell. *Acta Archaeologica Academiae Scientiarum Hungaricae* 70, 5–39.

Točík, A. 1964: Záchranný výskum v Bajči-Vlkanove v rokoch 1959–1960 (Rettungsgrabung von Bajč-Vlkanovo in den Jahren 1959–1960). *Študijné Zvesti Archeologického Ústavu Slovenskej Akadémie Vied* 12, 5–185.

Veliačik, L. 1983: *Die Lausitzer Kultur in der Slowakei.* Nitra.

Vinski-Gasparini, K. 1973: *Kultura polja sa* žarama *u sjevernoj Hrvatskoj (Die Urnenfelderkultur in Nordkroatien).* Sveučilište u Zagrebu Filozofski Fakultatet – Zadar Monografije Svezak 1/1. Zadar.

Vladár, J. 1974: *Die Dolche in der Slowakei.* Prähistorische Bronzefunde VI/3. München.

Wels-Weyrauch, U. 2015: *Die Dolche in Bayern auf der Grundlage einer Materialaufnahme von Eugen Friedrich Mayer.* Prähistorische Bronzefunde VI/15. Stuttgart.

Wüstemann, H. 1995: *Die Dolche und Stabdolche in Ostdeutschland.* Prähistorische Bronzefunde VI/8. Stuttgart.