Ősrégészeti Tanulmányok / Prehistoric Studies

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MOMENTS IN TIME

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Series Editors

Alexandra Anders, Gábor Kalla, Viktória Kiss,
Gabriella Kulcsár and Gábor V. Szabó

MOMENTS IN TIME

Papers Presented to Pál Raczky on His 60th Birthday

Edited by

Alexandra Anders and Gabriella Kulcsár

with

Gábor Kalla, Viktória Kiss and Gábor V. Szabó

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Interdisciplinary Archaeology

Bronze Hoard from Zalaszabar

New Data on the Study of the Tolnanémedi Horizon – Part 2

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In our previous paper on the Tolnanémedi depot horizon, we discussed the metallurgy of the Transdanubian Encrusted Pottery Culture, specificly focusing upon its developing and early phases. In this current paper, apropos the publication of the recently discovered Zalaszabar hoard, we are concentrating on the younger and late phases of the culture corresponding with the 2nd and 3rd phases of the Hungarian Middle Bronze Age summarizing the known data and shedding new light on its relationships with the Koszider phase.

Our discussion and summary of the Tolnanémedi horizon implies that the bronze pendants — which have often been dated to the Koszider period in the previous literature — found in the hoards of the Encrusted Pottery Culture, can genuinely be considered as antecedents of later, Koszider type objects. Although real Koszider type artefacts, e.g. trapezoidal hilted daggers and pins, which appear in the late phase of the Encrusted Pottery Culture, are absent in the Tolnanémedi type depots. This suggests that the low population numbers of the Encrusted Pottery Culture's late phase, dating to the beginning of the Koszider period, gradually embraced new waves of fashion. The deposition of the Tolnanémedi type hoards took place before the use of these new, Koszider style artefacts, and thus during the younger phase (RB A2b–2c) but prior the late phase (RB B) of the Encrusted Pottery Culture.

Based upon these observations, the arguments for the Tolnanémedi type hoards dating to the Koszider period are weak. The distinction of the two hoard horizons is also supported by metal analysis. Besides chronological data, new observations has started to suggest that the deposition of the hoards can rather be related to ritual activities than to wartime episodes as was previously thought.

A tolnanémedi kincshorizontról szóló előző tanulmányunkban a mészbetétes kerámia kultúrája fémművességének kialakuló és korai fázisát tárgyaltuk. Az alábbiakban — a zalaszabari kincs közlése kapcsán — a kultúrának a magyarországi középső bronzkor 2–3. fázisára keltezhető, fiatalabb és kései időszakába sorolható adatokat összegezzük, kitérve ezen időszak és a koszideri korszak viszonyának kérdésére is.

A tolnanémedi horizont újabb áttekintése szerint a mészbetétes kerámia kultúrája kincseiben gyakran koszideri korúnak meghatározott bronzcsüngők többnyire a valódi koszideri típusok előzményeiként értékelhetők. Ezzel szemben a valóban koszideri korú trapézalakú markolatlapos tőrök és a mészbetétes kerámia kultúrája kései fázisában megfigyelt tűk a tolnanémedi depókban nincsenek meg. Ez arra utal, hogy a kultúrának a koszideri időszakra keltezhető, kései időszakában élt népesség lassan a korábbitól eltérő viseletre tért át és a tolnanémedi kincseket még ezek használata előtt, vagyis a fiatal fázis során (RB A2b–2c), de a kései mészbetétes időszakot (RB B) megelőzően rejtették földbe.

Mindezek alapján cáfolhatók azok a vélemények, melyek szerint a tolnanémedi kincsek nagyjából egységes időszakban való elrejtése nem megalapozott vagy elrejtésük ideje a koszideri korszakra tehető. A két kincskör szétválasztását támasztják alá az eddig végzett fémvizsgálatok is. Az időrendi megállapítások mellett fontosak azok az adatok is, melyek szerint a kincsek elrejtése vélhetően inkább rituális tevékenységhez köthető, mint háborús eseményekhez.

INTRODUCTION

In our previus paper on the Tolnanémedi metal horizon, we discussed the metallurgy of the Transdanubian Encrusted Pottery Culture, specificly focusing upon its developing and early phases (Honti–Kiss 2000). In this current paper, apropos the publication of the recently discovered Zalaszabar hoard, we are concentrating on the younger and late phases of the culture corresponding with the 2nd and 3rd phases of the Hungarian Middle Bronze Age (RB A2b–RB B) summarizing the known data and shedding new light on its relationships with the Koszider period.

THE BRONZE DEPOT

In the summer of 1998 a bronze depot of 55 pieces was discovered by József Németh, forester of the Kis-Balaton Water Directorate *(Vízügyi Igazgatóság)*, during plantation works in the Little Balaton region, in Zala county *(Fig. 1. 1)*. In the following spring another 28 artefacts was unearthed at the same spot.[1] Some fragmented pieces from the second hoard refit with broken artefacts from the first depot making it clear that the two hoards were initially deposited as one. The site of the hoard can be found among the westernmost distribution area of the Transdanubian Encrusted Pottery culture.

Regarded as a single hoard it contains 83 artefacts: 11 disc-shaped pendants, 32 intact or fragmented swallow tail-shaped pendants, 2 comb-shaped pendants, 12 upturned heart-shaped pendants, 2 crescent-shaped pendants, one and a half spectacle-spirals, 14 twisted tube-beads (made of metal sheets and wires), a double bronze tube, a fragment of a bent-ended neckring, 3 disc-headed pins, a wire spiral armring, a flanged axe, and a piece of casting sprue *(Fig. 1. 2)*. Total weight of the hoard is 1585.5 g.

One disc-shaped pendant with five concentrical ribs has light green patina; this piece was the one lying on the ground surface and which drew attention to the hoard. The rest of the artefacts have dark green noble patina. Many of them are fragmented or damaged, most likely caused by a plough-share. On the photographs the objects are shown in their damaged stage while the drawings try to reconstruct their original form.[2]

DESCRIPTION OF THE FINDS:[3]

The 11 disc-shaped pendants *(Scheibenanhänger)* belong to different types (Types 1b, 1c, 3a, 3b; Honti–Kiss 2000, 78), according to the placement of the ribs and the bosses.[4] The eye-holes were usually pierced after casting.

1. Disc-shaped pendant, cast. Two concentrical ribs around the boss in the middle (Type 1b). Quadrangular eye-hole. There is also another, semi-finished eye-hole on the object; bulging on the reverse side, however it does not pierce through the sheet. Inv. No. 2010.2.1.1. D.: 5.4 cm, W.: 39.5 g *(Fig. 2. 1)*.
2. Disc-shaped pendant, cast. Two concentrical ribs around the boss in the middle (Type 1b). Quadrangular eye-hole. Inv. No. 2010.2.1.2. D.: 5.4 cm, W.: 41 g *(Fig. 2. 2)*. According to the irregular and oval ribs the two pendants were made in the same mould.
3. Disc-shaped pendant, cast. Five concentrical ribs running around the boss in the middle (Type 1c). Oval eye-hole. Inv. No. 2010.2.1.3. D.: 5.9 cm, W.: 48.5 g *(Fig. 2. 3)*.
4. Disc-shaped pendant, cast. A crossed rib and a concentrical rib run on the edge of the disc (Type 3a). Round eye-hole. Inv. No. 2010.2.1.4. D.: 5.4 cm, W.: 34 g *(Fig. 2. 4)*.
5. Disc-shaped pendant, cast. Crossed rib and one concentrical rib run on the edge of the disc (Type 3a). Quadrangular eye-hole. Inv. No. 2010.2.1.5. D.: 5.4 cm, W.: 32.5 g *(Fig. 2. 5)*. According to the irregular rib running on the edges of the discs the two pendants were made in the same mould.
6. Disc-shaped pendant, cast. A crossed rib and a concentrical rib run on the edge of the disc (Type 3a). Round hole in the middle of the disc, that can be identified as a casting fault (air-bubble) is

[1] Here we would like to express our thanks to József Németh. The finds are located in the Balatoni Múzeum, Keszthely, Inv. Nos 2010.2.1–83. The hoard was first mentioned by Honti–Kiss 2000, Anm. 17. on the discovery of the first 55 artefacts.

[2] We are grateful to Csaba Tétényi for the photos, and to Péter Pál Hrivnák for the drawings.

[3] D.: diameter, W.: weight, L.: length, H.: height, Wi: width.

[4] Our typological system of disc-shaped pendants (Honti–Kiss 2000, 78, Abb. 4) is different from the previously published ones, as the appearance of new types (e.g. Type 1b and 1c were unknown until the discovery of the Zalaszabar hoard).

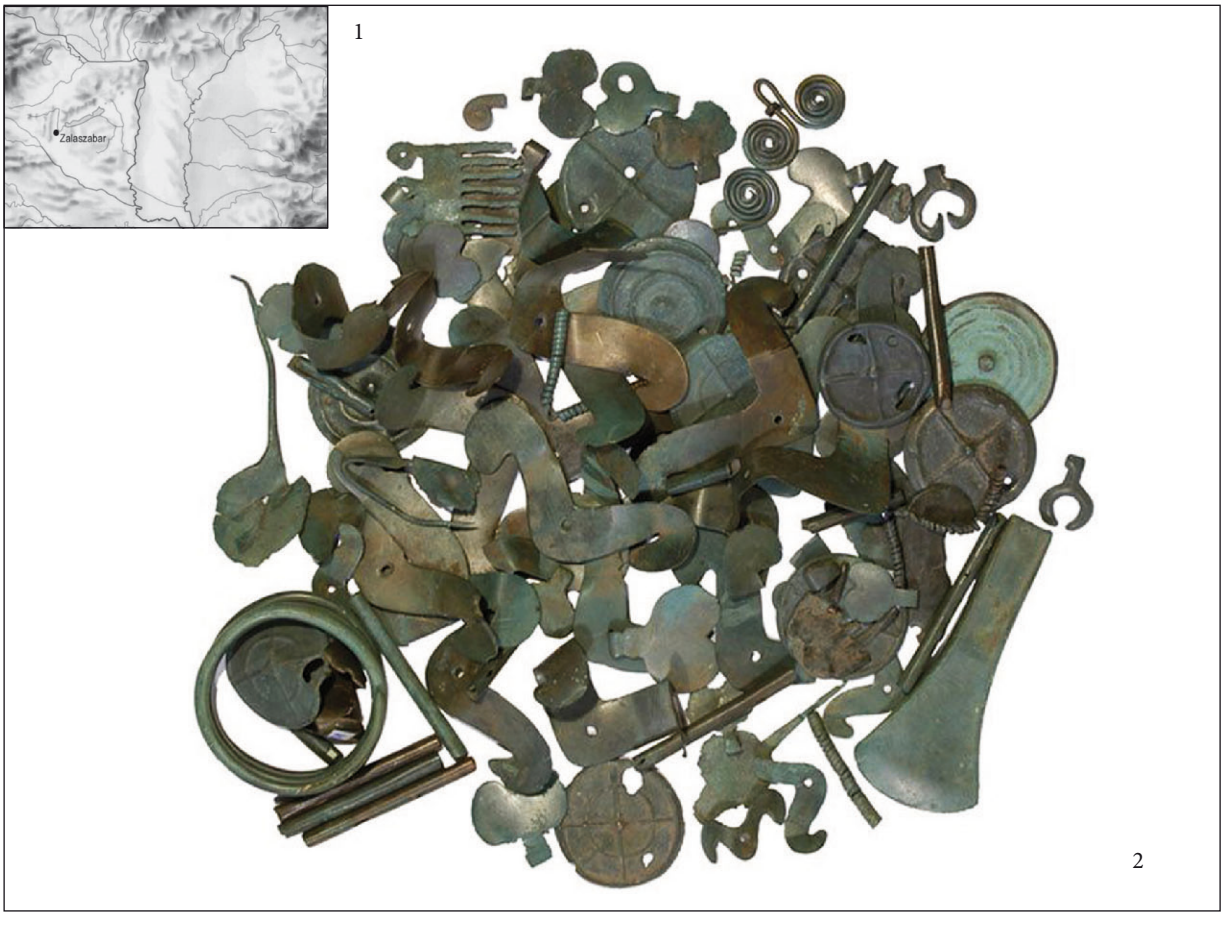

Fig. 1. 1: The location of Zalaszabar (map: © László Zentai 1996), 2: The bronze hoard from Zalaszabar

confirmed by the fact, that another, quadrangular hole for hanging has been pierced near to the edge of the pendant. Inv. No. 2010.2.1.6. D.: 5.4 cm, W.: 30 g *(Fig. 2. 6)*.

7. Disc-shaped pendant, cast. A crossed rib and a concentrical rib run on the edge of the disc (Type 3a). There are two irregular and one, more or less round casting faults in the middle part of the disc; the latter hole could have been used for hanging. Inv. No. 2010.2.1.7. D.: 4.4 cm, W.: 16 g *(Fig. 2. 7)*.
8. Disc-shaped pendant, cast. A crossed rib and two concentrical ribs decorate the disc. An additional rib runs in the quarter between the crossed ribs and the one on the edge (Type 3b). Round eye-hole. The pendant shows secondary bending and damage on the edge. Inv. No. 2010.2.1.8. The diameter of the slightly oval disc is 5 cm by 5.3 cm, W.: 21 g *(Fig. 2. 8)*.
9. Disc-shaped pendant, cast. A crossed rib and two concentrical ribs decorate the disc. An additional rib runs in the quarter between the crossed ribs and the one on the edge (Type 3b). There is a casting fault in between the two concentrical ribs that could have been used for hanging. Inv. No. 2010.2.1.9. The diameter of the slightly oval disc is 5 cm by 5.3 cm, W.: 23 g *(Fig. 2. 9)*.
10. Disc-shaped pendant, cast. A crossed rib and two concentrical ribs decorate the disc. An additional rib runs in the quarter between the crossed ribs and the one on the edge (Type 3b). There is a large casting fault in between the two concentrical ribs; one part of this hole could have been used for hanging. The pendant shows secondary bending and damage on the edge. Inv. No. 2010.2.1.10. The diameter of the slightly oval disc is 5 cm by 5.3 cm, W.: 21.8 g *(Fig. 2. 10)*.
11. Disc-shaped pendant, cast. A crossed rib and two concentrical ribs decorate the disc. An additional rib runs in the quarter between the crossed ribs and the one on the edge (Type 3b). There are two casting faults in between the two concentrical ribs; the smaller one could have been used for hanging. The pendant is secondarily bent. Inv.

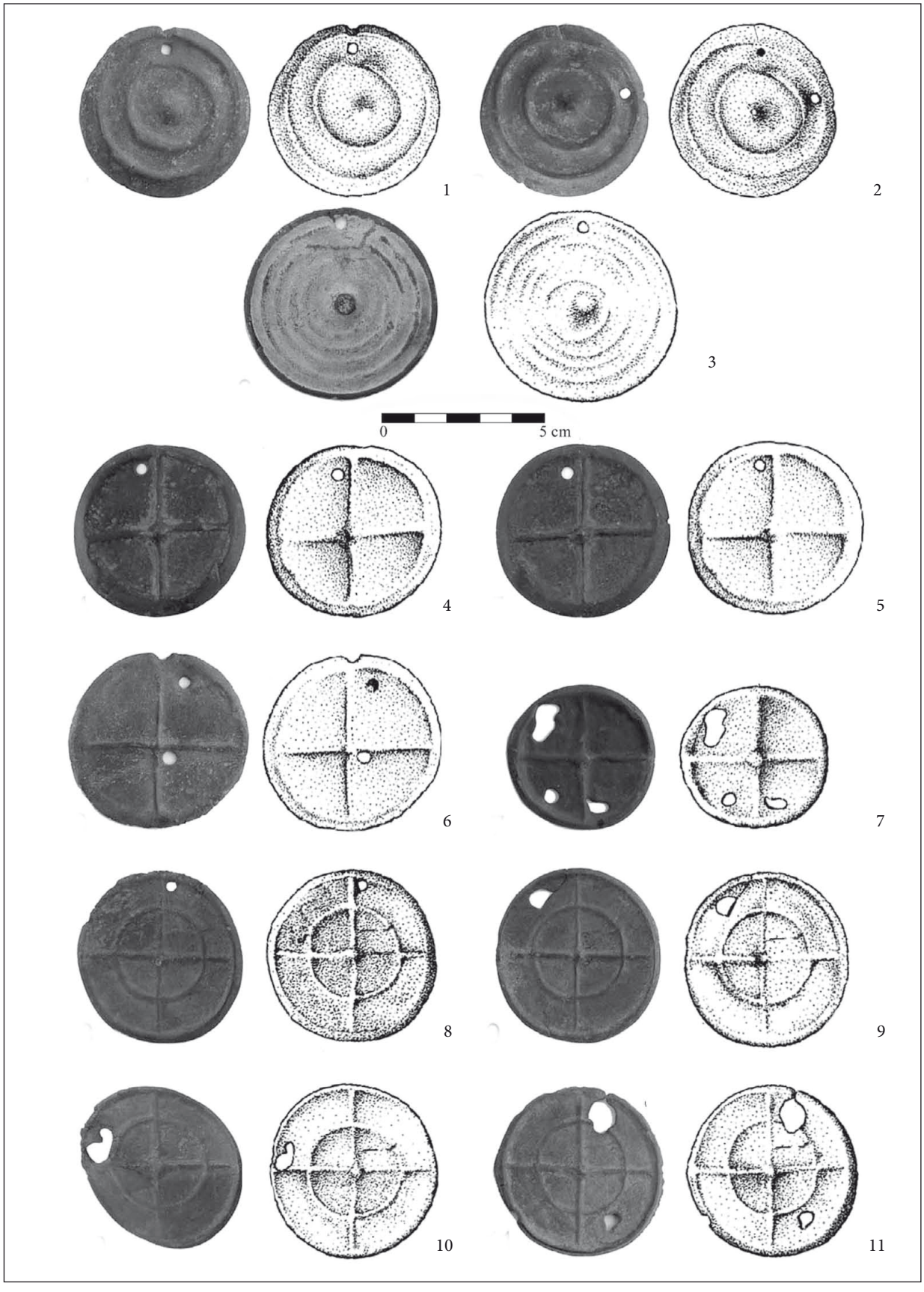

Fig. 2. Artefacts of the hoard from Zalaszabar

No. 2010.2.1.11. The diameter of the slightly oval disc is 5 cm by 5.3 cm, W.: 21 g *(Fig. 2. 11)*. Based on the similarly irregular details, the last four pendants were cast in the same mould.

The 32 swallow tail-shaped pendants *(Schwalbenschwanzförmige Anhänger)*[5] belong to a wide, sheet-like, flat-cast pendant type (Type 1a; Honti–Kiss 2000, 83). At least 18 different moulds were used; in some cases where the same mould was used differences can be observed in the formation of the pendants' end-parts as these areas were refined and polished after casting.

1. Swallow tail-shaped pendant, cast. Lozenge-shaped eye-hole. The pendant shows secondary bending. Inv. No. 2010.2.1.12. L.: 11.8 cm, H.: 6 cm, W.: 27.5 g *(Fig. 3. 1)*.
2. Swallow tail-shaped pendant, cast. Lozenge-shaped eye-hole. The pendant shows slight secondary bending.. Inv. No. 2010.2.1.13. L.: 11.3 cm, H.: 6.3 cm, W.: 26.5 g *(Fig. 3. 2)*.
3. Swallow tail-shaped pendant, cast. Lozenge-shaped eye-hole. Both sides of the pendant are secondarily bent and partly split. Inv. No. 2010.2.1.14. L.: 11.4 cm, H.: 6.2 cm, W.: 31 g *(Fig. 3. 3)*.
4. Swallow tail-shaped pendant, cast. Lozenge-shaped eye-hole. Both sides of the pendant show firm secondary bending and are partly split. Inv. No. 2010.2.1.15. L.: 11.8 cm, H.: 6 cm, W.: 28 g *(Fig. 3. 4)*.
5. Swallow tail-shaped pendant, cast. Quadrangular eye-hole. Both sides of the pendant show secondary bending. Inv. No. 2010.2.1.16. L.: 12 cm, H.: 6.4 cm, W.: 27 g *(Fig. 3. 5)*. Based on their shape these four pendants were most probably cast in the same mould.
6. Swallow tail-shaped pendant, cast. Lozenge-shaped eye-hole. One side of the pendant shows secondary bending and has been split; the other side is corroded, damaged. Inv. No. 2010.2.1.17. L.: 11.6 cm, H.: 6.6 cm, W.: 26.3 g *(Fig. 3. 6)*.
7. Swallow tail-shaped pendant, cast. Quadrangular eye-hole. One side of the pendant is bent secondarily. Inv. No. 2010.2.1.18. L.: 11.3 cm, H.: 5.8 cm, W.: 29 g *(Fig. 3. 7)*.
8. Swallow tail-shaped pendant, cast. Oval eye-hole. Inv. No. 2010.2.1.19. L.: 10.8 cm, H.: 5.9 cm, W.: 29.3 g *(Fig. 3. 8)*.
9. Swallow tail-shaped pendant, cast. Lozenge-shaped eye-hole. The pendant is firmly bent secondarily and broken into two parts at the eye-hole. Inv. No. 2010.2.1.20. L.: 10.9 cm, H.: 5.7 cm, W.: 28.3 g *(Fig. 3. 9)*. Regarding their shape, the above mentioned two pendants were most probably made in the same mould.
10. Swallow tail-shaped pendant, cast. Oval-shaped eye-hole. One side of the pendant shows firm secondary bending and has been broken into two parts. Inv. No. 2010.2.1.21. L.: 11 cm, H.: 6.2 cm, W.: 28 g *(Fig. 3. 10)*.
11. Swallow tail-shaped pendant, cast. Round eye-hole. The pendant is secondarily broken into two parts at the eye-hole and half of it is missing. Inv. No. 2010.2.1.22. Fragmentary L.: 5.5 cm, H.: 6.3 cm, W.: 15.7 g *(Fig. 3. 11)*. Based on their shape the last two pendants were probably cast in the same mould.
12. Swallow tail-shaped pendant, cast. Round eye-hole. The pendant is bent secondarily and partly split. Inv. No. 2010.2.1.23. L.: 10.8 cm; H.: 4.7 cm, W.: 21.7 g *(Fig. 3. 12)*.
13. Swallow tail-shaped pendant, cast. Quadrangular eye-hole. The pendant is showing secondary bending, some parts are corroded. One of its protrusions is broken into two parts. Inv. No. 2010.2.1.24. L.: 11.5 cm, H.: 4.6 cm, W.: 19 g *(Fig. 3. 13)*. Regarding their shape, the last two pendants were probably cast in the same mould.
14. Swallow tail-shaped pendant, cast. Oval eye-hole. The pendant is secondarily bent, one of the protrusions is partly split. Inv. No. 2010.2.1.25. L.: 11 cm, H.: 4.5 cm, W.: 20.8 g *(Fig. 3. 14)*.
15. Swallow tail-shaped pendant, cast. Round eye-hole. The pendant is secondarily bent. Inv. No. 2010.2.1.26. L.: 11.4 cm, H.: 4.7 cm, W.: 21.5 g *(Fig. 3. 15)*.
16. Swallow tail-shaped pendant, cast. Round eye-hole. The pendant is firmly bent secondarily and broken into two parts. Inv. No. 2010.2.1.27. L.: 11.3 cm, H.: 4.6 cm, W.: 21.5 g *(Fig. 3. 16)*.
17. Swallow tail-shaped pendant, cast. Quadrangular eye-hole. Both ends of the pendant are showing secondary splitting. Inv. No. 2010.2.1.28. L.: 11.2 cm, H.: 4.6 cm, W.: 22.5 g *(Fig. 3. 17)*. Based on their shape, the above mentioned four pendants were probably cast in the same mould.
18. Swallow tail-shaped pendant, cast. Round eye-hole. The pendant is showing, firm, secondary bending, one side of it is folded up. Inv. No.

[5] The "ankerförmige/anchor-form" term refers to another type of pendant; cf. Honti–Kiss 2000, 83: type 2.

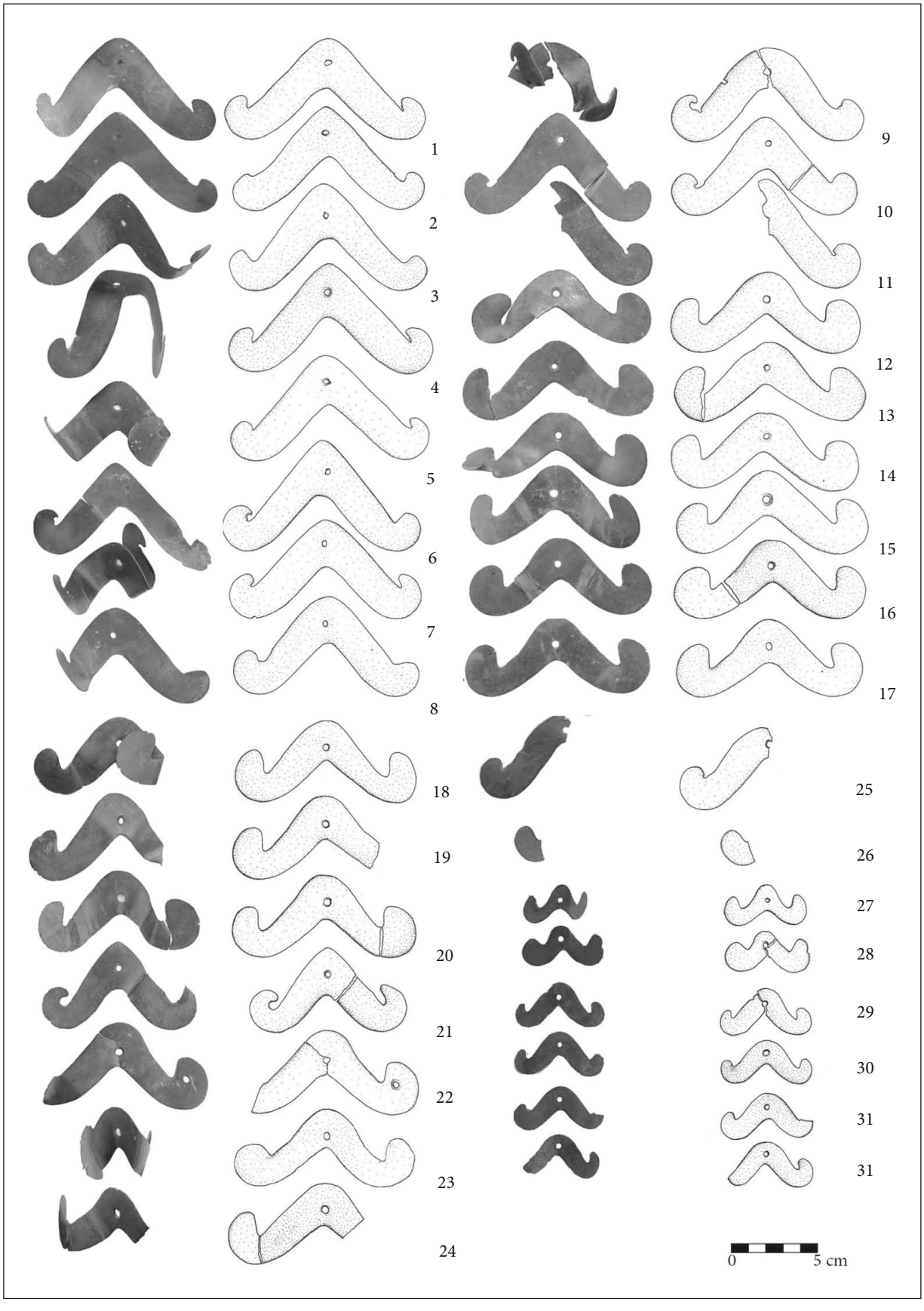

Fig. 3. Artefacts of the hoard from Zalaszabar

2010.2.1.29. L.: 10.9 cm, H.: 4.6 cm, W.: 20.5 g *(Fig. 3. 18)*.

19. Swallow tail-shaped pendant, cast. Quadrangular eye-hole. The pendant is bent secondarily and broken, one of the protrusions is missing. Inv. No. 2010.2.1.30. L.: 10.8 cm, H.: 4.9 cm, W.: 17.5 g *(Fig. 3. 19)*. Based on their shape, the last two pendants were possibly cast in the same mould.
20. Swallow tail-shaped pendant, cast. Round eye-hole. The pendant is firmly bent secondarily, one of the ends is broken into two pieces. Inv. No. 2010.2.1.31. L.: 10.8 cm, H.: 4.9 cm, W.: 19 g *(Fig. 3. 20)*.
21. Swallow tail-shaped pendant, cast. Round eye-hole. The pendant is showing strong secondary bending, one side of the pendant is broken into two parts. Inv. No. 2010.2.1.32. H.: 9.2 cm, M.: 5.2 cm, W.: 16.3 g *(Fig. 3. 21)*.
22. Swallow tail-shaped pendant, cast. Quadrangular eye-hole. The pendant is broken secondarily into two at the eye-hole. One of the ends of the pendant is also broken and missing. A casting fault hole or another oval-shaped hole is present on the other end. Inv. No. 2010.2.1.33. Fragmentary L.: 9.9 cm, H.: 5.0 cm, W.: 20 g *(Fig. 3. 22)*.
23. Swallow tail-shaped pendant, cast. Round eye-hole. The pendant is firmly bent secondarily and folded up. Inv. No. 2010.2.1.34. L.: 10.7 cm, H.: 4.6 cm, W.: 19 g *(Fig. 3. 23)*.
24. Swallow tail-shaped pendant, cast. Round eye-hole. The pendant is firmly bent secondarily. One side of the pendant is broken into two, the other side is also broken and the end of it is missing. Inv. No. 2010.2.1.35. Fragmentary L.: 8.4 cm, H.: 4.9 cm, W.: 14.7 g *(Fig. 3. 24)*.
25. Swallow tail-shaped pendant, cast. Round eye-hole. The pendant is secondarily broken into two parts at the hole, one side is missing. Inv. No. 2010.2.1.36. Fragmentary L.: 6.2 cm, H.: 3.9 cm, W.: 13 g *(Fig. 3. 25)*.
26. End part of a swallow tail-shaped pendant, cast. Inv. No. 2010.2.1.37. Fragmentary L.: 2.0 cm, W.: 0.2 g *(Fig. 3. 26)*.
27. Small swallow tail-shaped pendant, cast. Quadrangular eye-hole. The pendant is bent secondarily. Inv. No. 2010.2.1.38. L.: 4.9 cm, H.: 2.2 cm, W.: 5 g *(Fig. 3. 27)*.
28. Small swallow tail-shaped pendant, cast. Round eye-hole. The pendant is broken secondarily into two parts at the hole. Inv. No. 2010.2.1.39. L.: 5 cm, H.: 2.5 cm, W.: 3.5 g *(Fig. 3. 28)*.
29. Small swallow tail-shaped pendant, cast. Round eye-hole. The pendant is showing firm, secondary bending, broken into two parts at the hole. Some parts of it are corroded and damaged. Inv. No. 2010.2.1.40. L.: 5.5 cm, H.: 2.7 cm, W.: 4.5 g *(Fig. 3. 29)*.
30. Small swallow tail-shaped pendant, cast. Round eye-hole. The pendant is bent secondarily. Inv. No. 2010.2.1.41. L.: 5.5 cm, H.: 2.7 cm, W.: 4.5 g *(Fig. 3. 30)*.
31. Small swallow tail-shaped pendant, cast. Round eye-hole. The pendant is broken secondarily, one of the end parts is missing. Inv. No. 2010.2.1.42. L.: 5.5 cm, H.: 2.7 cm, W.: 4.5 g *(Fig. 3. 31)*.
32. Small swallow tail-shaped pendant, cast. Round eye-hole. The pendant is broken secondarily, one of the end parts is missing. Some parts of it are corroded and damaged. Inv. No. 2010.2.1.43. L.: 5.5 cm, H.: 2.7 cm, W.: 3.6 g *(Fig. 3. 32)*. Regarding their shape, the above mentioned four pendants were cast in the same mould.

The two comb-shaped pendants belong to two different types (Types a, c: Honti–Kiss 2000, 84).

1. Comb-shaped pendant, cast. It has a straight, horizontal upper part with triple hangers (Type a) and 7 quills. Two of the handles are damaged. Inv. No. 2010.2.1.44. H.: 5.4 cm, Wi.: 3.8 cm, W.: 11.5 g *(Fig. 4. 1)*.
2. The other comb-shaped pendant has a crescent shaped upper part (Type c), with a pierced hole and six quills. Two of the quills are strongly bent, one of them is broken, and three of them are missing. Inv. No. 2010.2.1.45. H.: 4.9 cm, Wi.: 3.7 cm, W.: 9.5 g *(Fig. 4. 2)*.

The upturned heart-shaped pendants are referred to by several names in the literature (*umgekehrt herzförmigen Anhänger, herzförmige Blechanhänger;* Honti–Kiss 2000, 88). These 12 pendants were cast in different sizes with rolled hangers.[6]

1. Upturned heart-shaped pendant, cast. One edge of the pendant is partly bent, with rolled hanger. Inv. No. 2010.2.1.46. H.: 4.6 cm, Wi.: 4.5 cm, W.: 9 g *(Fig. 4. 3)*.
2. Upturned heart-shaped pendant, cast. The pendant has a rolled hanger. One edge of the object

[6] The drawings show the back side of the pendants and the hangers in their original state.

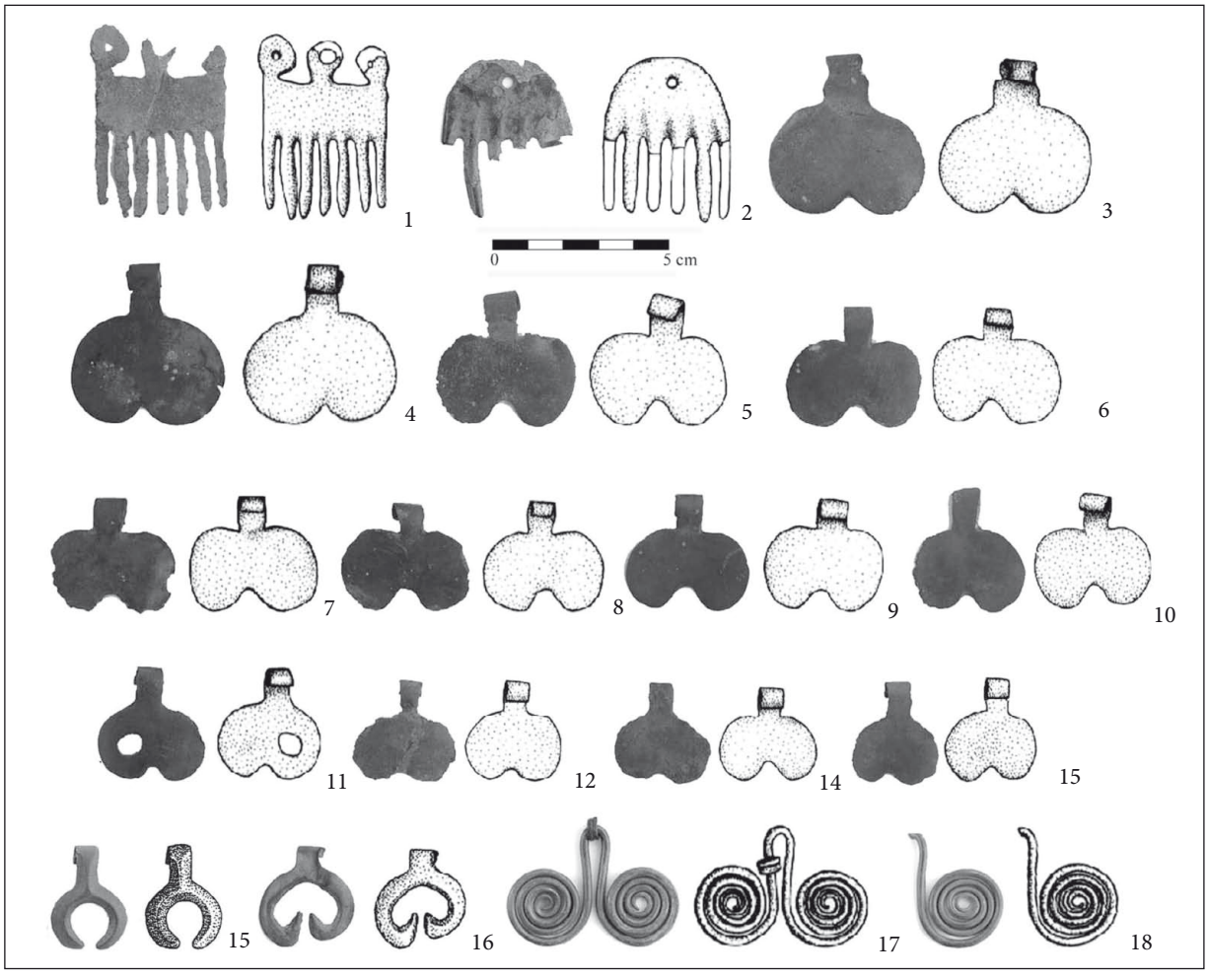

Fig. 4. Artefacts of the hoard from Zalaszabar

and the hanger are damaged and partly split. Inv. No. 2010.2.1.47. H.: 4.6 cm, Wi.: 4.7 cm, W.: 7.5 g *(Fig. 4. 4)*.

3. Upturned heart-shaped pendant, cast. The pendant has a rolled hanger. The edges are corroded, damaged. Inv. No. 2010.2.1.48. H.: 3.8 cm, Wi.: 4 cm, W.: 5.5 g *(Fig. 4. 5)*.
4. Upturned heart-shaped pendant, cast. The pendant has a rolled hanger. The edges are partly damaged. Inv. No. 2010.2.1.49. H.: 3.4 cm, Wi.: 3.8 cm, W.: 4.5 g *(Fig. 4. 6)*.
5. Upturned heart-shaped pendant, cast. The pendant has a rolled hanger. The edges are strongly corroded and damaged. Inv. No. 2010.2.1.50. H.: 3.3 cm, Wi.: 3.5 cm, W.: 5.5 g *(Fig. 4. 7)*.
6. Upturned heart-shaped pendant, cast. The pendant has a rolled hanger. The edges are partly damaged. Inv. No. 2010.2.1.51. H.: 3.2 cm, Wi.: 3.6 cm, W.: 4.5 g *(Fig. 4. 8)*.
7. Upturned heart-shaped pendant, cast. The pendant has a rolled hanger. Inv. No. 2010.2.1.52. H.: 3.3 cm, Wi.: 3.5 cm, W.: 6.2 g *(Fig. 4. 9)*.
8. Upturned heart-shaped pendant, cast. The pendant has a rolled hanger; a part of it is broken and missing. The edges are partly damaged. Inv. No. 2010.2.1.53. H.: 3.4 cm, Wi.: 3.2 cm, W.: 4.5 g *(Fig. 4. 10)*.
9. Upturned heart-shaped pendant, cast. The pendant has a rolled hanger. An oval casting fault is present on the object. The edges of one part of the pendant are strongly damaged. Inv. No. 2010.2.1.54. H.: 3.4 cm, Wi.: 3.1 cm, W.: 4.5 g *(Fig. 4. 11)*.
10. Upturned heart-shaped pendant, cast. The pendant has a rolled hanger. The edges and the middle part are strongly damaged. Inv. No. 2010.2.1.55. H.: 3 cm, Wi.: 3 cm, W.: 2.5 g *(Fig. 4. 12)*.

11. Upturned heart-shaped pendant, cast. The pendant has a rolled hanger. The edges are partly damaged. Inv. No. 2010.2.1.56. H.: 2.8 cm, Wi.: 2.7 cm, W.: 3.5 g *(Fig. 4. 13)*.
12. Upturned heart-shaped pendant, cast. The pendant has a rolled hanger. The edges are partly damaged. Inv. No. 2010.2.1.57. H.: 3 cm, Wi.: 2.5 cm, W.: 2.5 g *(Fig. 4. 14)*.

The two crescent-shaped pendants *(halbmondförmigen Anhänger)* belong to two different types (Mozsolics 1967, 87; Honti–Kiss 2000, 89–90).[7]

1. Crescent-shaped pendant, cast, with curving ends (Type 1). Triangular cross-section. The pendant has a rolled hanger. Inv. No. 2010.2.1.58. H.: 3.1 cm, Wi.: 2.2 cm, W.: 3.4 g *(Fig. 4. 15)*.
2. Crescent-shaped pendant, cast. It has strongly inwards-turning ends (Type 2). Triangular cross-section. The pendant has a rolled hanger. Inv. No. 2010.2.1.59. H.: 3 cm, Wi.: 2.8 cm, W.: 3.5 g *(Fig. 4. 16)*.

Two spectacle spirals *(Brillenförmiger Spiralanhänger)*: one complete and one fragmented piece:

1. Spectacle spiral. Coiled wire, with round cross-section. The pendant consists of two pairs of spirals. The ring-shaped hanger is twisted from thin spiral wire. Inv. No. 2010.2.1.60. H.: 3.5 cm, Wi.: 4.9 cm, W.: 13 g *(Fig. 4. 17)*.
2. Fragment of a spectacle spiral. Coiled wire, round in cross-section. The pendant consists of two pairs of spirals, one of them is missing. Inv. No. 2010.2.1.61. H.: 3.2 cm, Wi.: 2.5 cm, W.: 6.3 g *(Fig. 4. 18)*.

The 11 tube-beads were rolled from flat sheets of metal *(Blechröhrenperle)*:

1. Tube rolled from metal sheet. One end is corroded and partly broken. Inv. No. 2010.2.1.62. L.: 8.3 cm, W.: 8.2 g *(Fig. 5. 1)*.
2. Tube rolled from metal sheet. Secondary denting on one end. Inv. No. 2010.2.1.63. L.: 7.9 cm, W.: 11 g *(Fig. 5. 2)*.
3. Tube rolled from metal sheet. Inv. No. 2010.2.1.64. L.: 7.8 cm, W.: 8.5 g *(Fig. 5. 3)*.
4. Tube rolled from metal sheet. There are casting faults where the sheet folds over. Inv. No. 2010.2.1.65. L.: 7.5 cm, W.: 9.3 g *(Fig. 5. 4)*.
5. Tube rolled from metal sheet. One of its ends is partly broken, a secondary oval hole is present on the other end. Inv. No. 2010.2.1.66. Fragmentary L.: 7.5 cm, W.: 9 g *(Fig. 5. 5)*.
6. Tube rolled from metal sheet. Inv. No. 2010.2.1.67. L.: 7.3 cm, W.: 10.1 g *(Fig. 5. 6)*.
7. Tube rolled from metal sheet. Secondary denting and damage on fold. Inv. No. 2010.2.1.68. L.: 7.2 cm, W.: 8.4 g *(Fig. 5. 7)*.
8. Tube rolled from metal sheet. Casting fault is present on one end. Inv. No. 2010.2.1.69. L.: 6.6 cm, W.: 8.3 g *(Fig. 5. 8)*.
9. Tube rolled from metal sheet. It is secondarily bent and broken into two parts. Inv. No. 2010.2.1.70. L.: 6.8 cm, W.: 7.7 g *(Fig. 5. 9)*.
10. Tube rolled from metal sheet. It is secondarily bent and broken into two parts. Inv. No. 2010.2.1.71. L.: 7.5 cm, W.: 9.5 g *(Fig. 5. 10)*.
11. Tube rolled from metal sheet. It is secondarily broken into two parts, one half is missing. Casting fault is present at the fold. Inv. No. 2010.2.1.72. Fragmentary L.: 4 cm, W.: 4 g *(Fig. 5. 11)*.

The three tube-beads are twisted from spiral wires *(Spiralröhrenperle)*:

1. Wire spiral tube. Secondary breakage. Inv. No. 2010.2.1.73. Original L.: cca. 6.8 cm, W.: 4.5 g *(Fig. 5. 12)*.
2. Wire spiral tube. Secondarily bent. Inv. No. 2010.2.1.74. Original L.: *ca*. 8.2 cm, W.: 4.5 g *(Fig. 5. 13)*.
3. Wire spiral tube. Secondarily bent. Inv. No. 2010.2.1.75. Original L.: *ca*. 8 cm, W.: 5 g *(Fig. 5. 14)*.

One double bronze tube *(Doppelröllchen)* rolled from sheet bronze:

1. Inv. No. 2010.2.1.76. L.: 1.9 cm, W.: 1.5 g *(Fig. 5. 15)*.

Single, rolled-ended part of a neckring *(Ösenhalsring)*:

1. Inv. No. 2010.2.1.77. L.: 2 cm, W.: 5.7 g *(Fig. 5. 16)*.

Three disc-headed pins *(Griffösennadel mit Blechscheibenkopf)*:

[7] Names referred to by researchers were collected by Elisabeth Ruttkay (1983, 2).

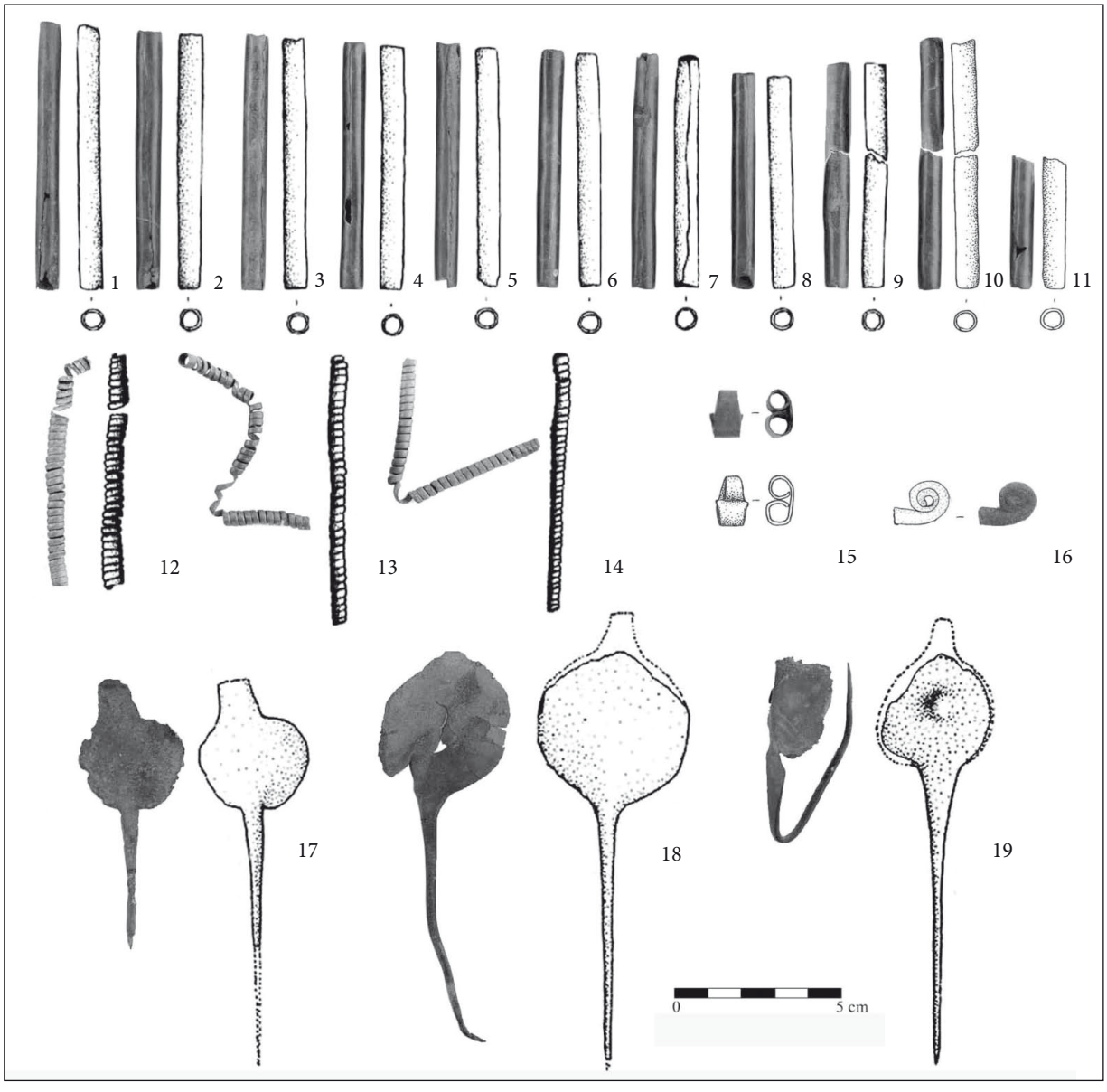

Fig. 5. Artefacts of the hoard from Zalaszabar

1. Disc-headed pin, undecorated, with smaller disc-head. Rectangular cross-section at the neck, and round cross-section at the tip. The rolled end of the hanger part, on the top of the disc-head, is missing. The edges of the disc-head are secondarily damaged and corroded. The shaft is damaged, and its lower part is missing. Inv. No. 2010.2.1.78. Fragmentary L.: 8.2 cm, W.: 4.7 g *(Fig. 5. 17)*.
2. Disc-headed pin, undecorated, with larger disc-head. Rectangular cross-section at the neck and round at the shaft. The rolled hanger part is missing from the top. The head is secondarily damaged and corroded in the middle part and around the edges. A small part of the end of the shaft is missing. Inv. No. 2010.2.1.79. Fragmentary L.: 12.3 cm, W.: 13.2 g *(Fig. 5. 18)*.
3. Disc-headed pin, with smaller, decorated disc-head. Boss in the middle and punched decoration around the edges. Rectangular cross-section at the neck, and round cross-section at the tip. The rolled hanger part is missing from the top of the object. The edges of the head of the pin are secondarily damaged and corroded, the decoration is hardly detectable. The disc-head is secondarily bent and damaged. The lower part of the shaft is bent. Inv. No. 2010.2.1.80. Fragmentary L.: 12.2 cm, W.: 6.8 g *(Fig. 5. 19)*.

One spiral armring *(Spiralarmring)* with three, triple-coiled, twisted wires, with an oval cross-section.

1. Inv. No. 2010.2.1.81. D.: 7.5-7.8 cm, W.: 175 g *(Fig. 6. 1)*.

One flanged axe *(Randleistenbeil)*, with a wide and curved blade. Its rim is quite short, and only frames the "neck piece".

1. 1. Inv. No. 2010.2.1.82. L.: 12.4 cm, W: 5.4 cm, W.: 238 g *(Fig. 6. 2)*.

One funnel-shaped casting sprue.

1. 1. Inv. No. 2010.2.1.83. L.: 1.8 cm, Wi.: 1.2 cm, W.: 7.5 g *(Fig. 6. 3)*.

The disc-shaped pendants *(Fig. 2)*, swallow tail-shaped *(Fig. 3)* and the comb-shaped pendants *(Fig. 4. 1–2)* are culture-specific jewellery of the Transdanubian Encrusted Pottery Culture (cf. Bóna 1975, 214–220). They are mostly known from the Tolnanémedi type hoards, however some of them are also found in burials of the culture's younger phase (RB A2b–c; Vörs-Papkert, Szederkény: Honti–Kiss 2000, 73–74, Abb. 1. 10–12; Kiss 2009a, 328, Fig. 4).

The upturned heart-shaped pendants *(Fig. 4. 3–14)* belong to the jewellery types of the Central European Early Bronze Age (RB A1–A2; Honti–Kiss 2000, 88–89).

Crescent-shaped pendants, spectacle spirals together with the tube-beads (spiral wire tubes or tubes rolled from metal sheets) are also common types found in Central European Early Bronze Age (RB A1–A2) assemblages.

The crescent-shaped pendants *(Fig. 4. 15–16)* are in use from the period of the Kisapostag Culture (Honti–Kiss 2000, 90; cf. also the new dating of the mould from Dunaújváros-Dunadűlő: Horváth 2004, 41, Abb. 8. 2). The hoards of Szőlőskislak (Honti–Kiss 2000, 90, Abb. 1. 5, 8–9) and Zalaszabar indicate that the two types of the crescent-shaped pendants had contemporary periods of wear in Transdanubia and the Type 2 of the pendant were in use until the late phase of the Transdanubian Encrusted Pottery Culture, at the beginning of the Koszider period (based upon its presence in the burial of Balatongyörök: MRT 1, 39, Site 6/9, 9. t. 5–18). However, they do not appear in genuine Koszider type hoards in Transdanubia.

Regardig spectacle spirals *(Fig. 4. 17–18)*, following their use in the Copper Age, appear again in the Hungarian Early and the Middle Bronze Age (Bóna 1965, Pl. IV. 9, Pl. VIII. 8; Szathmári 1983, 21; Kalicz-Schreiber 1984, Taf. LI. 22). In Transdanubia they are present among the material of the Tokod culture (RB A2a; Honti–Kiss 2000, 93) and in the younger burials of the Encrusted Pottery Culture (RB A2b–c; in the 1st phase of the Királyszentistván cemetery, Grave 37, Lengyel, Rábacsécsény-Fudipuszta: Wosinsky 1896, Taf. 72. 7; Mithay 1942, Taf. 9. 3; Bóna 1975, 216, Taf. 264. 8).

Tubes rolled from metal sheets *(Fig. 5. 1–11, 15)* and spiral wire tube-beads *(Fig. 5. 12–14)* were perhaps worn on garments, hat or as head ornaments from the end of the Early Bronze Age (late Nagyrév phase) until the end of the Middle Bronze Age (Koszider period) in Hungary (Bóna 1960, Pl. VII. 14, 20; 1975, 49, 54; Szathmári 1983, 21; Mozsolics 1988, Abb. 3. 4–5; Szathmári 1997). In Transdanubia they are known from the Kisapostag culture (RB A1b; Honti–Kiss 1996, 24; Somogyi 2004, Abb. 11. 1–4) until the younger phase of the Encrusted Pottery Culture (RB A2b–c; e.g., Királyszentistván, Mosonszentmiklós: Uzsoki 1963, 4. t. 11, 17–19; Bóna 1975, Taf. 264. 1, 4–5, 11–12, 14).

The neckrings (reworked by hammering, resulting in a round cross-section) with rolled ends *(Fig. 5. 16)* are known mostly from graves. These artefacts are considered to be neckrings or symbols of value as opposed to the simple rings that are defined as ingots (cf. Lenerz-de Wilde 1995; Butler 2002). István Bóna viewed the origins of these Transdanubian pieces as deriving from the western part of Central Europe. His theory could be proven by numerous neckring depots belonging to the Aunjetitz and Unterwölbling cultures (Mozsolics 1967, 70–71; Bóna 1975, 218, 282–283; Lenerz-de Wilde 1995; Neugebauer et al. 1999), and their characteristic metal (fahlore) composition (so called *Ösenring Kupfer*; Krause 2003, 160–166; Junk–Krause–Pernicka 2001). In Transdanubia they have been discovered in burials of the Tokod group (RB A2a; Honti–Kiss 2000, 93), graves of the older and younger phase of the Transdanubian Encrusted Pottery Culture (RB A2a–c; Alsónyék Grave B, Gyirmót-Kölesdomb, Rábacsécsény-Fudipuszta, Veszprém-Nagytó és Roboz utca sarka, Veszprém-Arany

János utca–Széchenyi utca sarok, Veszprém-Papvásártér, Zmajevac/Vörösmart; see also as stray finds: Tét, Dunaszekcső), and in the Tolnanémedi type hoards (Kiss in press, Fig. 14: Mosdós, Tata-Nagy Sándor utca, vicinity of Tata, Zalaszabar; Hampel 1896, 222. t. 2; Mithay 1942, 12, IX. t. 5, XI. t. 5; Mozsolics 1967, 69–72; Bóna 1975, 218, 283, Taf. 271. 4, Verbreitungskarte VII; Krause 1988, 84–88, Abb. 44, Liste 8; Kisné Cseh 1997, 1. tábla). With respect to the rolled ends and the analysed pieces' high tin content, the Transdanubian neckrings can be considered as finished artefacts (cf. Lenerz-de Wilde 1995, 267–269, Karte 5; Neugebauer et al. 1999, 39, Tab. 7). The raw material of the piece from Gyirmót is low impurity copper (with As and Ni; Krause 2003, Cl. 34/5) alloyed with 8% tin (Junghans–Sangmeister–Schröder 1974, Nr. 13818); the neckring of the hoard from Tata-Nagy Sándor utca was manufactured from pure copper with high silver content (SAM E00; in Krause's system similar to Cl. 34/2 or 13) alloyed with 13.7% tin (Kisné Cseh 1997, Chart 1).

Disc-headed pins *(Fig. 5. 17–19)* are present from the Kisapostag and from the Kisapostag–Vatya period (cf. Dunaújváros, Kisapostag). They are known from sites of the Encrusted Pottery Culture as well (RB A2b–c), from both burials (Gyirmót-Kölesdomb, Szekszárd-Vígh telek) and hoards (Esztergom-Ispitahegy, Ipoly Valley, Simontornya, Zalaszabar). This type of artefact originates from the western part of Central Europe (SW-Germany and Schwitzerland). The pins from Gyirmót, Ipoly Valley, Simontornya, Szekszárd and one of the Zalaszabar pieces have decorated head. I. Bóna proposed that piece found in the Ipoly Valley was western import, while others found elsewhere were local replicas (Bóna 1975, 218–219, 288–289; Novotná 1980, 20–24; Szathmári 1983, Abb. 56; 1988, 74–75).

Wire spiral armrings with numerous coils *(Fig. 6. 1)* can be found in the Carpathian Basin from the 2nd and 3rd phases of the Early Bronze Age. They appear in larger numbers in the beginning of the Middle Bronze Age (see Gáta–Wieselburg, Vatya, Perjámos cultures; V. Szabó 1997, 64–65 and note 13). In Transdanubia they appear among the material of the Kisapostag culture (RB A1b), occurring in the Late Kisapostag–Early Encrusted Pottery phase, in the burials of the Tokod culture (RB A2a; Honti–Kiss 2000, 93), and in the Encrusted Pottery Culture's assemblages (RB A2b–c; from graves: Gyirmót-Kölesdomb, Szekszárd, Szekszárd-Vígh telek, vicinity of Tata, Rábacsécsény, Veszprém-Papvásártér, Siklós-Téglagyár; from hoards: Kórós, Mosdós, Zalaszabar; Bóna 1975, 217).

The flanged axes *(Fig. 6. 2)* are usually distinguished by the curvature of the blade. Based upon its shape and the shortness of the rim, the axe of Zalaszabar is an earlier type. Good analogues are known among the artefacts of the Franzhausen I cemetery — belonging to the Unterwölbling culture, from the cemetery of Nesvady/Naszvad — dating to the classical Aunjetitz period, and among the Saxon *("Sächsischen")* type flanged axes (RB A2a–c; Novotná 1970, 35–37, Taf. 10. 191–192, 200–201, Taf. 11. 202; Mayer 1977, 76–84, Taf. 17. 241, Taf. 109.A, Taf. 118.B; Neugebauer 1994, 83, Abb. 33. 4; Schalk 1998, 51–53, Taf. 8. 9). On these grounds this type can be dated to the 1st and 2nd phase of the Middle Bronze Age in the Carpathian Basin.

Based on typochronological data of the Zalaszabar depot's younger metal pieces, the deposition of the hoard can be dated to the 2nd phase of the Hungarian Middle Bronze Age (RB A2b–c).

THE TOLNANÉMEDI TYPE HOARDS AND THE KOSZIDER PERIOD

Tolnanémedi type hoards contain the characteristic metal artefacts of the Transdanubian Encrusted Pottery Culture. The relationship between the Tolnanémedi type depots and the Koszider horizon is still an important research question. Amália Mozsolics, contrary to her earlier observations (Mozsolics 1957, Abb. 5: IIIa and IIIb horizon) and to I. Bóna's opinion (Bóna 1958, 224; 1975, 214–220, 226; 1992a, 41–42: Chronological plate), discussed most of the Tolnanémedi type hoards among the depots of the Koszider period (Mozsolics 1967, 124, Abb. 36). Tibor Kovács dealt with the Encrusted Pottery Culture's bronze manufacture in several of his articles, and emphasized the importance to distinguish between the Tolnanémedi and the Koszider hoard horizons (Kovács 1969, 208–209; 1984, 377). However, in his later works on ornaments and weapons, he considered that some styles of the Tolnanémedi type hoards survived until the Koszider period; meaning that a so called "Tolnanémedi horizon" can not be dis-

Fig. 6. Artefacts of the hoard from Zalaszabar

tinguished. He highlighted the similarities of the objects between the Tolnanémedi and Koszider types, and refused to relate the deposition of the two hoard horizons to specific episodes (Kovács 1994a; 1994b, 159). Recently Svend Hansen also observed that the disc-shaped and the anchor-shaped pendants can be found in both depot-horizons, so he considers some hoards of the Koszider period being part of the Tolnanémedi type hoards (Hansen 2005, 218–219, Abb. 3–4). Summarizing the above data regarding artefact types, it is possible to reach a different conclusion: our opinion is that the two depot-groups were deposited during different periods.

According to T. Kovács metal artefacts of the Encrusted Pottery Culture, which remained in use until the Koszider period, are represented by the cross-ribbed disc-shaped pendants discovered in depot 1 of Dunaújváros-Koszider (Kovács 1994a, 122–123; 1994b, 160, Abb. 3). However, there are differences in wear and manufacturing technique of the disc-shaped pendants found in this particular depot and the pieces of the Tolnanémedi type hoards, that were thoroughly discussed earlier (Honti–Kiss 2000, 79). The hoard of Budaörs does not support T. Kovács's theory either. The publisher Frigyes Kőszegi (Kőszegi 1981) clearly dates these finds to the late Vatya phase, prior to the Koszider period based on its container vessel.

There also exist theories arguing for the contemporality of the swallow-tail and anchor-shaped pendants, based on hoards where both artefacts occur or where the swallow-tail pendants are associated with other, younger objects (Bölcske, Kölesd-Nagyhangos, Kötegyán, Százhalombatta Depot 2; "Transdanubia"/Somogy county; Dunaújváros-Koszider Depot 3: Kovács 1994b, 160, Abb. 2; Hansen 2005, Abb. 4). However, A. Mozsolics already distinguished between the large sized, flat swallow-tail pendants found in the territory of the Encrusted Pottery Culture, and the smaller sized, solid cast variants (anchor shaped pendants; Mozsolics 1967, 90; Honti–Kiss 2000, 83) known from some Koszider hoards (e.g., Dunaújváros-Koszider Depot 3, Százhalombatta Depot 2, "Transdanubia"/Somogy county). The pieces in the hoard from Kölesd-Nagyhangos do not provide clear evidence since the real content of the hoard is uncertain. In this depot both types of pendants appear allegedly together — as A. Mozsolics published the artefacts belonging to the Hungarian National Museum's collection (Mozsolics 1967, 151–152, Taf. 31–33) as the Kölesd-Nagyhangos depot, while I. Bóna photographed the finds located in the museum of Szekszárd under the same name (Bóna 1975, 228–229, Taf. 270. 1–19; 1992b, 60–61).[8] These latter artefacts of the museum of Szekszárd are later referred to as of unknown provenance in

[8] In this way the cross-ribbed pendants, comb-shaped and human-shaped pendants are different in the mentioned publications (cf. Furmánek 1997, 313–314). We consider both assamblages to evaluate the hoard from Nagyhangos.

publications (Schumacher-Matthäus 1985, 71, Anm. 229; Kovács 1994b, note 52), although T. Kovács did mention Bóna's pieces among the collection of comb-shaped pendants (Kovács 1986, Abb. 1. 1, 5). The assemblage of Bölcske and Kötegyán can not with certainty dated to the Koszider period either, and they have only distant connections with the Tolnanémedi type hoards.[9] However, if we accept their dating to the Koszider period, the presence of an older piece among younger objects could be easily explained by its bronze content, and that it was kept because of its value. There are several examples proving the curation of older, unusable pieces, for example the fragmented swallow-tail shaped pendants in the Százhalombatta depot 2 (Kovács 1999, Abb. 28, Katalog Nr. 35/12), and the broken human-shaped pendant of Včelince/Méhi depot 1 (Furmánek 1980, 15, Taf. 5. 100; Honti–Kiss 2000, 87) among younger objects. On these grounds S. Hansen's theory pronouncing the new grouping of the Tolnanémedi type hoards can be confuted.

The upturned heart-shaped pendants, that are often found among the Encrusted Pottery Culture's artefacts (Honti–Kiss 2000, 88–89), also mentioned as proof for the Koszider period dating of the Tolnanémedi type depots (Kovács 1994b, 160, Abb. 4). Since these latter pendants are common Central European ornaments, in our opinion their presence in the Koszider type hoard of Košice-Barca/Kassa-Bárca do not affect the dating of the Tolnanémedi type hoards.

Our discussion and summary of the Tolnanémedi horizon implies that the mentioned pendants — which have often been dated to the Koszider period in the previous literature — found in the hoards of the Encrusted Pottery Culture, can genuinely be considered as antecedents of later, Koszider type objects.

Although there are real Koszider type artefacts, e.g. trapezoidal hilted daggers (Kiss 1999) and pins (e.g. the Wetzleinsdorf type pin from the burial of Veszprém or the double cone-headed pins of the burials from Zmajevac, Esztergom-Vár utca and Mosonszentmiklós: Uzsoki 1963, 4. t. 15; Mozsolics 1967, Taf. 29. 5, Bóna 1975, Taf. 271. 3; Torma 1976, I. t. 5; Kovács 1994a, 120, 3. ábra 3) which appear in the late phase of the Encrusted Pottery Culture. However, these are absent in the Tolnanémedi type depots. This suggests that the low population numbers of the Encrusted Pottery Culture's later phase, dating to the beginning of the Koszider period (Torma 1976; Kovács 1977, 1988, 1994a, 1994b; Honti 1994a, 1994b; Kiss 1997), gradually embraced new waves of fashion. The deposition of the Tolnanémedi type hoards took place before the use of the new, Koszider style artefacts, and thus during the younger phase (RB A2b–2c) but prior the late phase (RB B) of the Encrusted Pottery Culture.

Based upon these observations, the arguments for the Tolnanémedi type hoards dating to the Koszider period are weak.[10] The distinction of the two hoard horizons is also supported by metal analysis (Schubert–Schubert 1967, 189, Abb. 38; Kemenczei 1968; V. Vadász–Vékony 1978, note 126; Kiss 2009b, Fig. 7). Artefacts of the Tolnanémedi type hoards were usually made of *Ösenring* copper, while Koszider type artefacts (e.g. the above mentioned cone-headed pins from Zmajevac and Mosonszentmiklós-Grave 29: Junghans–Sangmeister–Schröder 1974, Nr. 13336, Nr. 13832) were made of east Alpine copper (SAM F A/B or *Einheitskupfer*; Krause 2003, Cl. 34/4).[11]

[9] In the publication of the Kötegyán depot T. Kovács (1969, 209) writes: "the anchor-shaped pendant on its own appears to be to the youngest piece of the assemblage, can not mark the deposition of the hoard, and based solely upon this artefact it can not be dated to the concealment period of other Koszider type hoards." Similarly as the depot from Bölcske (Mozsolics 1967, Taf. 34).

[10] Besides chronological data, new observations has started to suggest that the deposition of the Tolnanémedi type hoards can rather be related to ritual activities than to wartime episodes as was previously thought (cf. Kovács 1994a, 121; Kiss 2009a).

[11] A similar change in the ore supply was concluded at the Mannersdorf am Leithagebirge cemetery of the Gáta–Wieselburg culture (Duberow–Pernicka–Krenn-Leeb 2009, 342–345). Cf. also Liversage 1994, 72–75.

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