

Grzegorz Kuś<sup>1</sup>, Maciej Trzeciecki<sup>2</sup>, Paweł Gan<sup>3</sup>

## DOWN BY THE RIVER TO THE MIDDLE OF NOWHERE? AVAR-PERIOD METAL ARTEFACTS DISCOVERED IN JANOWIEC, SITE 3, PUŁAWY DISTRICT

### ABSTRACT

Kuś G., Trzeciecki M. and Gan P. 2022. Down by the river to the middle of nowhere? Avar-period metal artefacts discovered in Janowiec, site 3, Puławy district. *Sprawozdania Archeologiczne* 74/2, 289-316.

The text discusses the results of typological and metallographic analyses of metal objects dated to the 7<sup>th</sup>-8<sup>th</sup> centuries from Janowiec on the Vistula River, including five bronze strap fittings, two silver bracelets with trumpet-like endings, two bronze bars, and lumps of melted metal. The analyses of the fittings indicate their direct associations with the Avar Kaganate. Currently, the fittings from Janowiec comprise the most numerous assemblage of Avar imports from Polish lands. The form and technology of manufacture of the bracelets is typical for the area between the middle Dnipro and the middle Danube, while their decorative patterns refer to the art of the Avars. Interestingly, such an assemblage was discovered in the territory currently regarded as peripheral or even wholly uninhabited. The finds from Janowiec document contacts between the emerging “tribal” elites of northern and north-eastern Lesser Poland and the Transcarpathian areas and indicate the role of the Vistula as a communicational axis.

Keywords: Early Middle Ages, Lesser Poland, interregional contacts, Avar belt, metallographic analysis

Received: 28.12.2021; Revised: 13.02.2022; Accepted: 20.07.2022

1 Stowarzyszenie Przyjaciół Państwowego Muzeum Archeologicznego, ul. Długa 52, 00-241 Warszawa; grzechukus@gmail.com; ORCID: 0000-0001-7395-3820

2 Institute of Archaeology and Ethnology, Polish Academy of Sciences; al. Solidarności 105, 00-140 Warszawa; misieko42003@gmail.com; ORCID: 0000-0003-9419-2677

3 Institute of Archaeology and Ethnology, Polish Academy of Sciences; al. Solidarności 105, 00-140 Warszawa; pawel.gan@gmail.com; ORCID: 0000-0002-1679-0989

## 1. INTRODUCTION

Until recently, the territory between the middle Vistula and the Pilica rivers has not aroused much interest in researchers studying the history of Polish lands in late Antiquity and the early Middle Ages. Maps illustrating the ranges of settled zones, strongholds location, or imports distribution show an uninhabited zone between culture-forming centres and emerging political structures (see *e.g.*: Poleski 2013a, 323-324, fig. 3). However, investigations and discoveries of recent years prove that the “no man’s land” on the middle Vistula can instead be regarded as an “unknown land”, awaiting its discoverers. The finds from Site 3 in Janowiec on the Vistula River presented in this text prove such a thesis. The group of metal objects of southern and south-eastern provenance discussed here, generally dated to the Late Avar period, shows surprisingly extensive interregional contacts between communities living in the region discussed here, long before it became part of the early Piast state.

Site 3 (AZP 76-75/47) in Janowiec, Puławy district, is located on the sandy terrace’s gently sloping edge, closing the Vistula valley from the northwest. The current river bed is approximately two kilometers from the site (Fig. 1). The valley partly serves for agricultural purposes, partly is wetland, with a network of canals accompanying ponds. The partially canalized Plewka river flows at the foot of the terrace and falls into the Vistula above Janowiec. Geographically, the site is located on the border of two Mezoregions – the

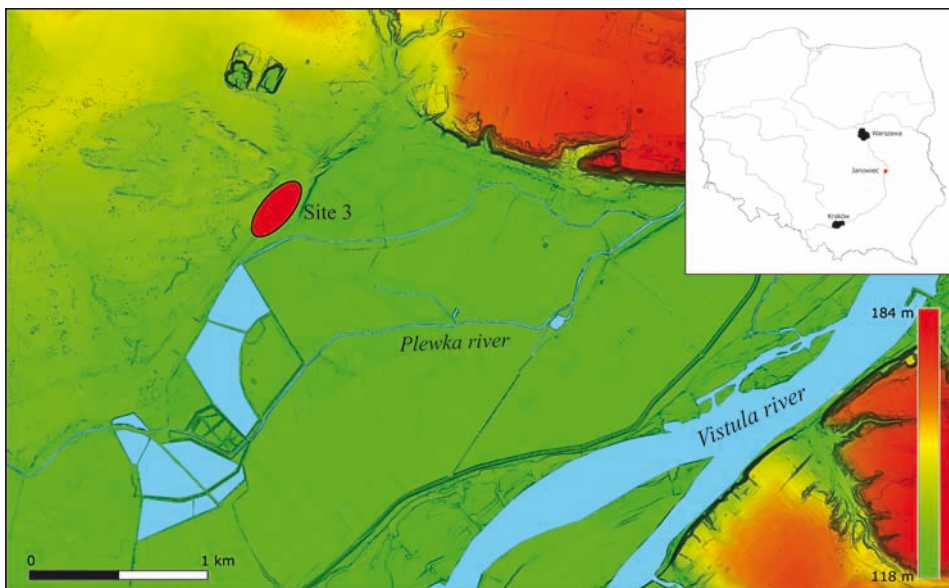


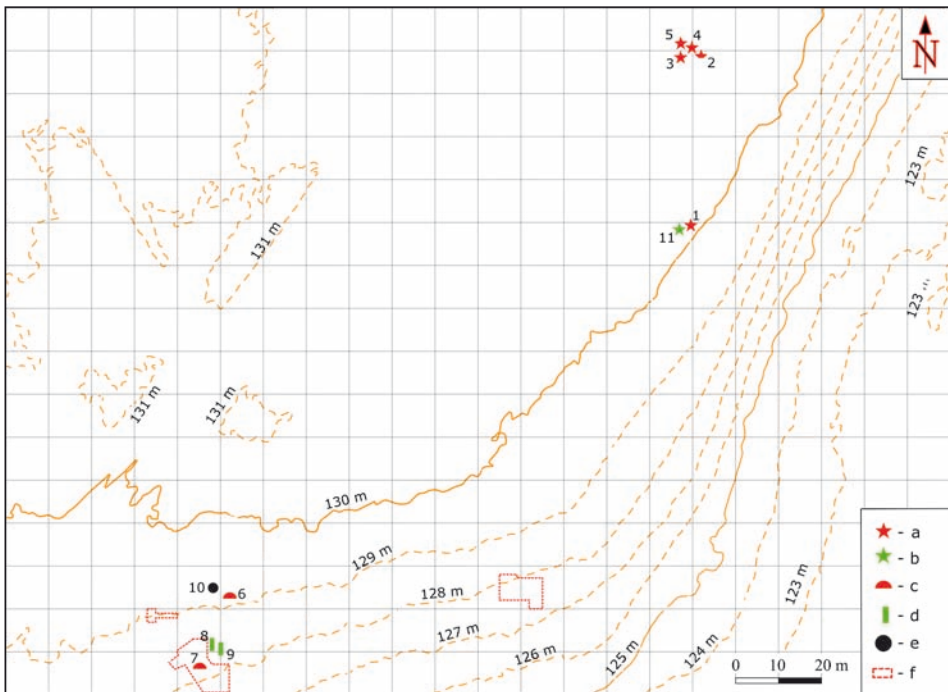
Fig. 1. Location of Site 3 in Janowiec, Puławy district. Prepared by G. Kuś

Radom Plain and the Małopolska Gap of the Vistula River (Solon *et al.* 2018). The site was discovered in 1981 during surveys carried out as part of the Polish Archaeological Record project (Bargieł and Zakościelna 1995, 318), excavation work, and surface prospection have been carried out here since 2017. So far, excavations have covered an area of only 1.8 ares. More than 40 archaeological features were discovered, the majority of them dated back to the Roman period. A relatively small number of Early Medieval features have been discovered there so far. Their chronology refers to the 11<sup>th</sup>-12<sup>th</sup> centuries AD, with the exception of one pit containing sherds of handmade vessels dated preliminarily to the 7<sup>th</sup>-8<sup>th</sup> centuries AD. A detailed surface survey with metal detectors, repeated every year, has covered an area of approximately 3 hectares. It provided a set of finds relatively widely dated – from the Bronze Age to the Post-medieval period. The most numerous are artefacts from the Roman and Post-medieval periods. Fragments of two Migration period fibulae of Baltic provenance are also worth mentioning (Kuś 2021), along with objects discussed here, dated to the earlier phases of the Early Middle Ages.

The following text is – as already mentioned – a presentation of a selected group of finds, along with typological and chronological analysis, supported by the results of laboratory tests carried out in the Central Laboratory of Bio- and Archaeometry IAE PAN. Given the initial state of investigation of the site, conclusions regarding the provenance of objects and roles they may have played in local socio-cultural contexts are preliminary. They indicate, however, the potential of future studies on the Early Medieval history of this region, overlooked until recently.

## 2. THE FINDS

The collection of artefacts discussed here includes five strap fittings made of copper alloy, fragments of two silver bracelets, along with two metal bars and an object interpreted as a negative of the pouring channel of a casting mould. The fittings (No. 1-5, 11) along with one bracelet (No. 6), alleged bars of raw material (No 8, 9), and a negative of the pouring channel (No. 10), have been acquired in the course of metal detector surveys, from the contemporary humus. Fittings No. 2-5 were discovered in the north-eastern part of the site, in a small cluster not exceeding 20 m<sup>2</sup>. Fitting No. 1 and a lump of metal (No. 11) were found in the eastern part of the investigated area, about 40 m from the cluster described above. Bracelet No. 6, metal bars, and pouring channel (No. 8-10) occurred in the southern part of the site. Another bracelet fragment (No. 7) was discovered in the archaeological trench located in the southern part of the site. It was found in a pit (Feature 28), preliminarily dated to the 11<sup>th</sup>-12<sup>th</sup> century. The bracelet fragment was lying at the interface between the contemporary humus layer and the filling of the pit. It is worth noting that the distance between the finds of both bracelets is 17 m in a straight line, while the extreme distance between the finds is 186 m (Fig. 2).



**Fig. 2.** Janowiec, Site 3, location of the discussed finds, numbered as in catalogue. Legend: a – Avar strap fittings; b – a probably strap fitting; c – bracelets; d – bars of raw material; e – a negative of the pouring channel of a casting mould; f – archaeological trenches. Prepared by G. Kuś

1. Bipartite strap fitting (Fig. 3: 1; sample number: CL20883). The upper plaque has a form of an inverted shield, 27 mm high and a maximum width of 19 mm. In the outer frame, 3 mm thick, an openwork relief in the form of two strongly geometrized plant motifs located on both sides of the vertical axis of symmetry of the shield is closed. Two holes with rivets 5 mm long and 1 mm in diameter are placed on the axis of symmetry of the plaque. A pad strengthening the attachment to the belt is preserved on the lower rivet. The plate ends with two holders supporting an iron axis to which a movable lower part of the application is attached. Apparently, it could have had the form of a highly simplified palmette, of which only the supporting volutes are preserved. The weight of the fitting (after conservation) is 7 g.

2. Strap end (Fig. 3: 2; sample number: CL20884). Massive (weight after conservation 11.76 g), hollow U-shaped plate, 27 mm high and maximum 15 mm wide. Both sides are decorated with openwork, a strongly geometric floral motif, closed in a wide frame with transverse cuts around the perimeter. The images differ in details. Two pairs of eyelets are located on the upper edge. They have the form of strongly profiled triangles. Rivets to fix the fitting at the end of the strap are still in place.

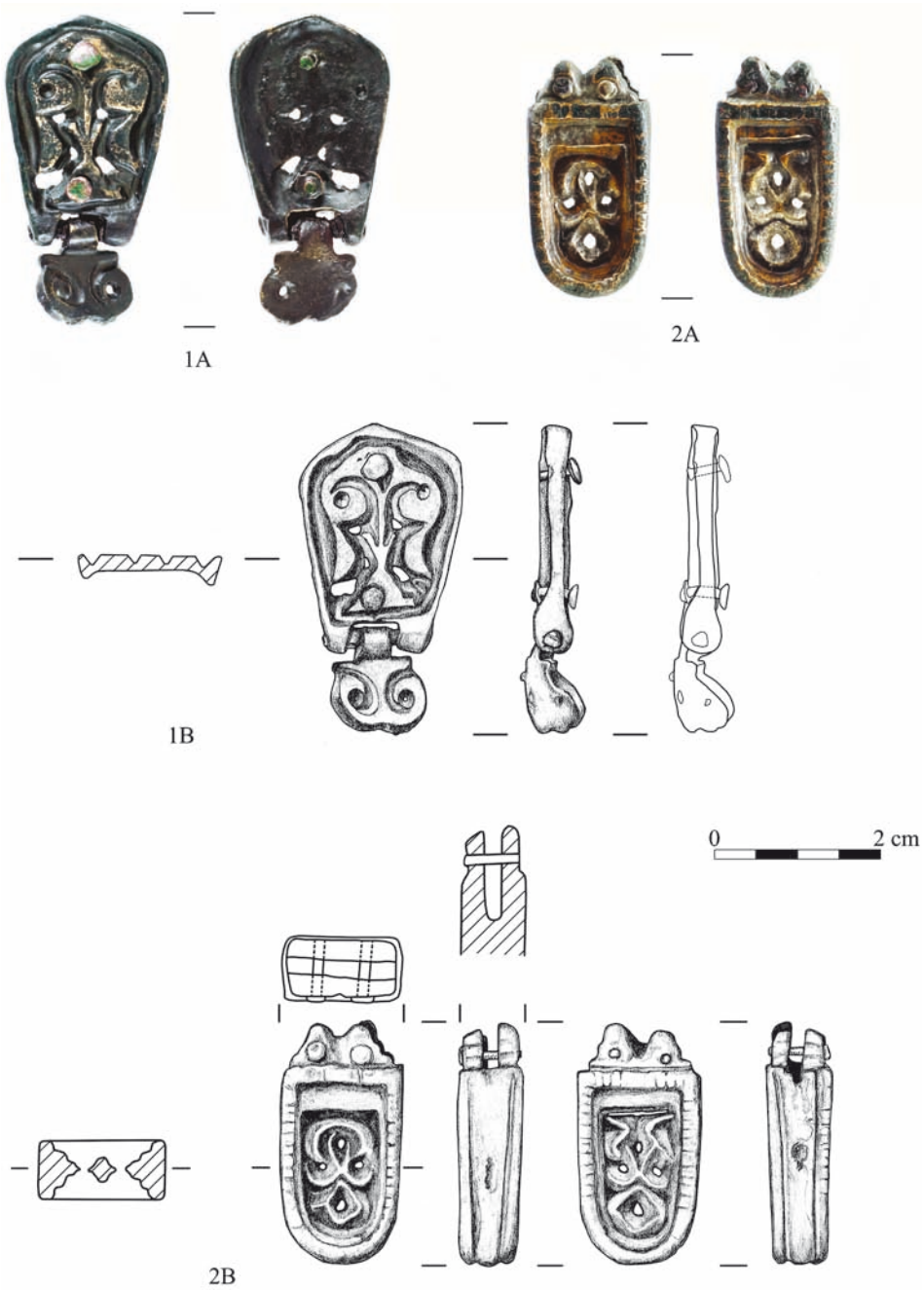


Fig. 3. Janowiec, Site 3, strap fittings. Drawn by A. Łyszkowicz, photo G. Kuś

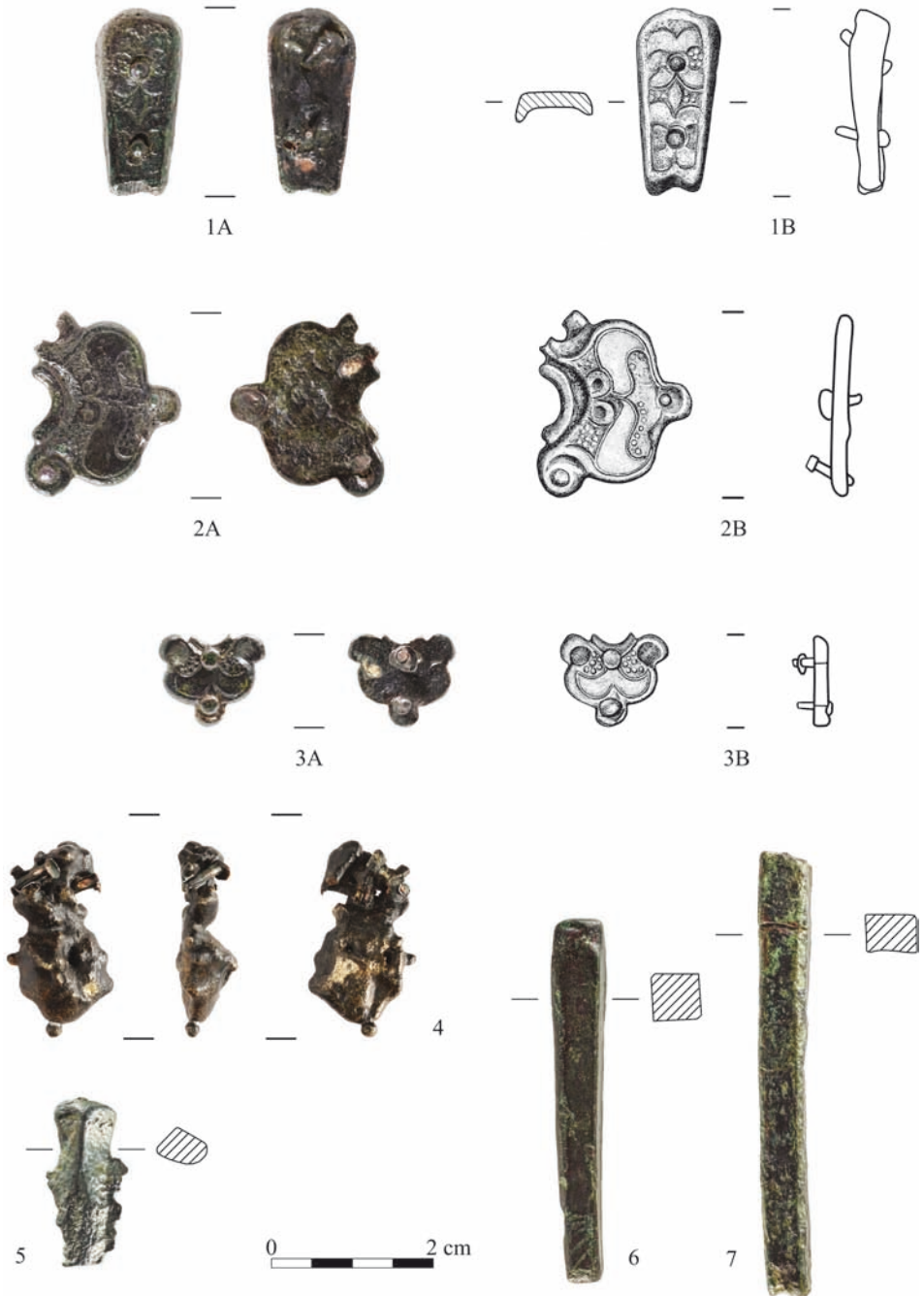


Fig. 4. Janowiec, Site 3, strap fittings (1-3), melted fitting (4), negative of a pouring channel (5), bars of bronze (6, 7). Drawn by A. Łyszkowicz, photo G. Kuś

3. Fragment of strap fitting (Fig. 4: 1; sample number: CL20891) in the form of an elongated plate, slightly narrowing towards one of the ends, 22 mm long, maximum 10 mm wide, and weighing 3 g. The inner surface is slightly concave. The flat outer surface is decorated with an engraved floral motif composed of two palmettes, integrated into the background partially covered with a stamped ornament imitating granulation. Along the vertical axis of symmetry, both ends of the shield are provided with two holes holding rivets, each about 1 mm in diameter and about 5 mm long. A pad strengthening the attachment to the strap is preserved on one of the rivets. The lower edge of the shield shows signs of damage and, unfortunately, is severely damaged. This hinders determining whether the object in question is a fragment of a single or bipartite fitting.

4. Strap fitting in the form of a flat, heart-shaped shield with three oval protrusions (Fig. 3: 2; sample number: CL20893), width 22 mm, height 18 mm, thickness 2 mm, weight 2.88 g. The outer surface is decorated with an engraved floral motif of symmetrically arranged stylized leaves, surrounded by a stamped ornament imitating granulation. Rivet holes are placed in the protrusions, with two preserved rivets, each with a diameter of 1 mm and of length 5 mm. Remains of a pad are visible at the end of one of them. The third protrusion is partially damaged.

5. Strap fitting in the form of a flat, heart-shaped shield with three oval protrusions (Fig. 3: 3; sample number: CL20892), width 12.5 mm, height 11 mm, thickness 2 mm, weight 1.26 g. The outer surface is decorated with an engraved floral motif of symmetrically arranged stylized leaves, surrounded by a stamped ornament imitating granulation. Rivet holes are placed along the symmetry axis, at the upper and lower edge of the plaque. The rivets, each with a diameter of 1 mm and length of 5 mm, are preserved. Remains of a pad are visible at the end of one of them.

6. Fragment of a bracelet made of a circular silver bar with a diameter of 3.4 mm, with a thickened ending with a diameter of 11.5 mm (Fig. 5: 1; sample number: CL20886). The length, measured along the outer circumference, is 55 mm, the weight is 16.72 g. The decorated strand at the ending is about 13 mm wide. It does not cover the entire circumference of the bracelet. The ornament includes three horizontal stripes filled with S-shaped stamp impressions, sometimes not very carefully printed, separated by single engraved lines. The decorated zone is closed at the top and bottom with double engraved lines. Numerous irregularities and single cracks are visible on the surface, presumably due to a lack of final finishing or the influence of high temperature on the finished product.

7. Fragment of a bracelet made of a circular silver bar with a diameter of 3.5 mm, with a thickened ending with a diameter of 15 mm (Fig. 5: 2; sample number: CL20885). The length, measured along the outer circumference, is 69 mm, the weight is 20.39 g. The decorated strand at the ending is about 12 mm wide. It does not cover the entire circumference of the bracelet. The ornament consists of three horizontal stripes of stamped decoration imitating granulation separated by undecorated belts and limited at the bottom by a single

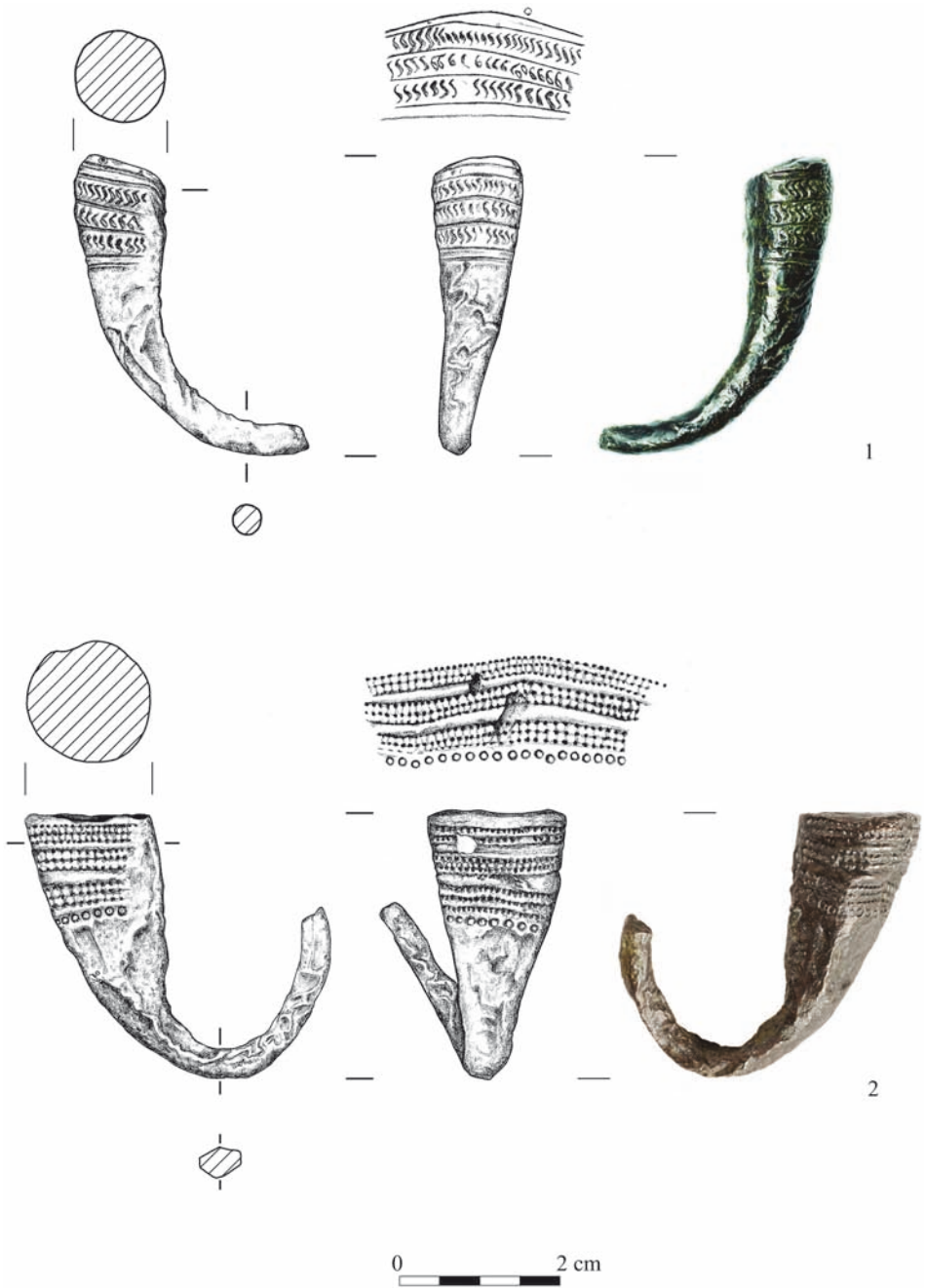


Fig. 5. Janowiec, Site 3, fragments of bracelets. Drawn by A. Łyszkowicz, photo G. Kuś



line of stamped circles. As in the case of the previously described item, the surface of the preserved fragment is deformed.

The survey also produced a group of copper alloy objects, probably related to the on-site processing of the raw material. Although there is no stratigraphic data unambiguously linking the finds with the artefacts described above, we included them in chemical analyses for comparative purposes. The assemblage encompasses:

8. A bar of raw material, square in cross-section, length 45 mm, width 6 mm, weight 9.57 g (Fig. 4: 6; sample number: CL20922).

9. A bar of raw material, rectangular in cross-section, length 55 mm, width 6 × 5 mm, weight 9.92 g. (Fig. 4: 7; sample number: CL20923).

10. A cast of the pouring channel of a mould, 21 mm high, with irregular protrusions at the edges. Weight 3.12 g. (Fig. 4: 5; sample number: CL20924).

11. An irregular piece of melted metal, probably strap fitting, maximum dimensions of 24 × 13 × 8 mm, the weight of 4.85 g. Two partly melted rivets approximately 7 mm long and 1 mm in diameter are visible at one end (Fig. 4:4; sample number: CL20887).

### 3. TYPOLOGY AND CHRONOLOGY

The strap fittings described above can be recognized as elements of the so-called belt sets, characteristic of the material culture of the Avars (*cf.* Szóke 2008, further literature there). Fitting No. 1 is a metal element of the main belt. It served for attaching an additional vertical strap. Numerous applications of similar forms and decorative patterns occur in most of the Late Avar cemeteries in the territory of today's Hungary. The set of seven fittings from Grave 491 in the cemetery in Székkutas, Csongrad county (Nagy 2003, 64, 65, fig. 175: 6-12), along with five appliqués from Grave 5 in the Atokháza-Bilisics cemetery in Ásotthalom, Csongrad county (Csallány 1957, 15-116, 128, fig. 5, Pl. 29: 1-5) should be mentioned here. They differ only in minor details from the fitting from Janowiec. Similar fittings occur also at cemeteries in the Somogy county: Fészerlak-pusztá (today part of Kaposvár; Szimonova 1972, 161-163, fig. 61) and Zamárdi-Rétiföldek (Bárdos, Garam 2014, 36-37, 70, 71-74, fig. 183, 204, 206). A strap fitting from Grave 79 in the Szob-Homokok-dűlő cemetery, Pest county, near today's Hungarian-Slovak border is also worth mentioning (Kovrig 1975, 178, 179, fig. 8: 79:10). Among the closest analogies, one can also point to the fitting found in a Late Avar cemetery in Edelstal, in Austrian Burgenland (Hampel 1894, 141, 142, Taf. 142: 23). Similar appliqués are also known from the territories south of the middle Danube, including the Mandelos cemetery in Vojvodina (Bugarski 2015, 134, fig. 6).

Similar fittings occur relatively often in the Late Avar cemeteries in Slovakia. Attention should be paid primarily to the forms classified as types 245, 247, and 253 according to the classification of Jozef Zábajník. In the case of the latter type, an apparent similarity of the

decorative pattern should be stressed. Presumably, the form of the damaged lower plate of the fitting from Janowiec was similar to the appliqué representing type 247. The aforementioned fittings types are included in the SSIII phase, dated to 750-780 AD (Zábojník 1991, 239, 248, fig. 40: 1-3, 9, 10; 41: 1). It is worth emphasizing that the finds of fittings representing types 245, 247, and 253 concentrate in cemeteries located in southwestern Slovakia, starting from the Bratislava-Čunovo cemetery (Zábojník 1991, fig. 40: 9), through three fittings from Nove Zamky (Zábojník 1991, fig. 40: 2, 3, 10) to the recently published appliqué from the cemetery in Obid (Zábojník 1991, fig. 40: 1; 2019, tab. 134). This list can be expanded to include the fitting from the Hungarian Szob, mentioned above, located less than 30 km east of Obid, and the bipartite application from the Austrian Edelstal, located only 15 km southwest Bratislava.

Strap fittings similar to the item discussed here also occur in the areas adjacent to the Kaganate. A series of finds from the 8<sup>th</sup>-9<sup>th</sup> century stronghold in Tismice, Kolin district deserves mentioning (Profantová *et al.* 2020, 217-219, obr. 22: 13-15, 17, 21). Thanks to systematic metal detector surveys, the stronghold provided an exceptionally rich collection of Late Avar style belt-set elements, already exceeding 100 items, along with finds indicating the local production of at least some of them (*cf.* Profantová 2020; Profantová *et al.* 2020, further literature there). Two fittings from the Croatian Biskupija are also noteworthy. These are loose finds, although undoubtedly deriving from the vast settlement complex associated with Knin – the seat of Croatian rulers in the 10<sup>th</sup>-11<sup>th</sup> centuries (Petrinec 2009, 36, fig. 90: 19, 20).

Bipartite strap fittings with the upper part in the form of an inverted shield only sporadically occur north of the Carpathians. An appliqué from Syrynia, Wodzisław district, can be regarded as the closest analogy from the Polish lands (Szymański 1962b, 307, fig. 17; see also Boroń and Foltyn 2011, 24, further literature there). Recently published strap fitting from the stronghold in Czermno, Tomaszów district should also be mentioned here. However, it differs from the find from Janowiec in the ornamentation details and proportions of the shield (Wołoszyn *et al.* 2016, 697-698, fig. 4).

Fitting No. 2 was placed at the end an additional strap attached to the main belt (*cf.* Szőke 2008). Similar, one-piece and hollow applications decorated with an openwork ornament are relatively rare, both in the Kaganate and neighboring territories. One related example is the fitting from Grave 133 in the Late Avar cemetery in Pilismarót-Basaharc, Esztergom county, which is the closest analogy, differing only in minor details (Fettich 1965, 47-48, fig. 81: 3). Similar, although more extended fittings also occurred in two cemeteries from Hungarian Transdanubia – Zalaegerszeg, Zala county (Szőke 2001, 103, fig. 2: 3) and Zamárdi, Somogy county (Bárdos and Garam 2014, 60-61, 124-125, fig. 196: 6, 235: 10-13). A strap end from the already-mentioned cemetery in Fészerlak-pusztá also deserves attention (Szimonova 1972, 161-163, fig. 61). However, it should be borne in mind that the aforementioned applications differ from the find from Janowiec in the details of the decorative pattern.

In the assemblages from the Late Avar cemeteries in Slovakia and Lower Austria, similar fittings occur rarely. Strap ends representing type 107, and partly 99, according to J. Zábajník, can be regarded as close analogies in terms of form, although they differ in the openwork details. Both types can be referred to as phases SSIII and SSIV, dated to 750-800 AD (Zábajník 1991, 239-242, 248, fig. 23: 5; 24: 3-5).

Interestingly, a strap end almost identical to the find from Janowiec has been found outside the Kaganate, in the Czech Basin, in the vicinity of the stronghold Praha Dolní Liboc-Šárka, dated to 8<sup>th</sup>-10<sup>th</sup> centuries (Turek 1950, 62 fig. 2: 3; Profantová 1992, 664, tabl. 6: 4, 52: 2). Similar in form, though differently decorated, is a fitting from the stronghold in Tismice (Profantová *et al.* 2020, 217, fig. 22: 11). A strap end from the Avar warrior grave in the cemetery in Brateiu, Site 2, Sibiu district, Romania, is also worth recalling here (Zaharia 1977, 62, fig. 29: 2).

Fitting No. 3 was attached to the main belt (*cf.* Szóke 2008). Similar applications often appear in sets of several to a dozen items, both one-piece and bipartite. The belt set from Grave 3 in the Székkutas cemetery can serve as an example here. It includes 15 appliqués stylistically close to the find from Janowiec, among them only five one-piece fittings (Nagy 2003, 17, fig. 5: 1-15). Another cemetery located in the Great Plain, in Jánoshida, Jász-Nagykun, Szolnok county, provided 14 similar applications (Grave 30; Erdélyi 1958, 11, 12, fig. 13: 4, 5). An assemblage also containing 14 stylistically similar fittings (six one-piece items) was a part of the beltset from Grave 1866 in the cemetery in Zamárdi-Rétiföldek, Somogy county (Bárdos and Garam 2014, 60, 61, fig. 196: 8-21). A set of 13 appliqués (including two one-piece ones) occurred in Grave 142 in the Szebény I cemetery, Baranya county (Garam 1975, 82, fig. 11: 142:3-15; Pl. 14: 14). Seven partially damaged fittings, three of which were probably one-piece, from Grave 239 in the cemetery in Pilismarót-Basaharc also deserve mentioning (Fettich 1965, 80, 81, fig. 144: 3-9).

Similar fittings are not very abundant in the Late Avar cemeteries in Slovakia and Lower Austria. They were classified as type 234 according to J. Zábajník, characteristic of the SSIV phase, dated to the years 780-800 AD (Zábajník 1991, 241, 248, fig. 38: 20). They also can be found in the Czech lands – at least four fittings of that type are present in the collection from the stronghold in Tismice (Profantová 2020, 164, fig 4: 6, 7; Profantová *et al.* 2020, 217-220, fig. 23: 14-17). An analogous appliqué was found at the Kosoř /Praha-Radotín stronghold (Profantová 2015, 83, fig 5: 4). A stylistically similar strap fitting occurred in the aforementioned Avar warrior grave in Brateiu, Site 2 (Zaharia 1977, 62, fig. 29: 3), along with strap end analogous to the fitting No. 2 from Janowiec, discussed above.

Strap fittings No. 4 and 5 are characterized by identical form and decorative pattern; only the sizes differ. Fitting No. 4 is a metal reinforcement of the main belt holes while fitting No. 5 was probably attached to an additional strap (*cf.* Szóke 2008). Appliqués of a similar, highly standardized form can be found in the majority of the Late Avar cemeteries in today's Hungary. However, it should be emphasized that such a group is characterized by a vast array of ornamentation details. Therefore, it is difficult to indicate direct analogies

to the finds from Janowiec. Undoubtedly, they have parallels among the strap fittings from the cemeteries mentioned above, including finds from Graves 3 (18 items) and 54 (28 items) in Székkutas (Nagy 2003, 17, 23, fig. 4: 8-17, 26: 4-7, 21-44), from Grave 1866 in Zamárdi (16 items; Bárdos and Garam 2014, 60, 61, fig. 196: 2-34), from Grave 30 in Jánoshida (12 items; Erdélyi 1958, 11, 12, fig. 13: 10-12), and from Grave 142 in Szebény I (26 items; Garam 1975, 82, fig. 11: 142:16-18, 21-35, Pl. 14: 10, 11). Similar appliqués occurred also in the cemetery Pilismarót-Basaharc (Fettich 1965, 13, 80, 81, fig. 6: 5, 7, 144: 11, 12). In the Late Avar cemeteries of Slovakia and Lower Austria, similar fittings are classified as type 172 according to J. Zábójník, they are characteristic for the SSIII and SSIV phases dated to 750-800 AD (Zábójník 1991, 239-242, 248, fig. 33: 20-24).

Fittings representing such a stylistic group are also present in the areas neighbouring the Kaganate, both from the south and the north. They occur relatively often in the Czech Basin and western Slovakia (see *e.g.*, Profantová *et al.* 2020, 217-219, fig. 23: 20, 25-29, 34-36, 41, 42). We also know a few finds from Polish lands, but it should be borne in mind that they do not constitute direct analogies to the fittings from Janowiec in terms of form and decoration. Nonetheless, appliqués from Biskupin, Żnin district, Naszacowice, Nowy Sącz district should be mentioned here, along with an unpublished set of four Late Avar fittings from Gródek upon the Bug River, Hrubieszów district, that also includes metal reinforcements of the main belt holes (Robak 2018, 94, 95, fig. 2: 1; 3: 8, 9, further literature there).

Summing up this necessarily brief typological and chronological analysis, it can be stated that the discussed metal strap fittings can be undoubtedly associated with the Late Avar period – given both the chronology and the stylistic features of the forms and ornamentation. Considering Gergely Szenthe's classification of changes in the decorative style of Late Avar strap applications, two groups can be distinguished in the Janowiec collection. The first one, representing the so-called Geometrical Circular Lobe Style, typical for the second half of the 8<sup>th</sup> century, includes fitting No. 1. Appliques No. 2-5 represent the declining horizon of the Avar decorative art, dated back to the last decades of the 8<sup>th</sup> and the beginning of the 9<sup>th</sup> centuries (Szenthe 2013, 314-316, fig. 3). It cannot be ruled out that the latter group of fittings from Janowiec had initially been part of the same belt set. Their location in a relatively small area, not exceeding 20 m<sup>2</sup>, might support such a hypothesis (Fig. 5).

Finds Nos. 6 and 7 represent the type described as bracelets with trumpet-like endings. Although similar forms, made of copper or silver alloys, occur over vast areas of Europe from the Roman period to the early Middle Ages, bracelets with trumpet-like endings appear to be particularly characteristic for assemblages of early Slavic culture, particularly from the Middle Dnipro River basin, where they are dated relatively widely to the 6<sup>th</sup>-8<sup>th</sup> centuries. They occur in graves, strongholds, and open settlements, although primarily in hoards of the so-called Martynovka type (*cf. e.g.*: Košnar 1994, 76-90; Szymański 1995, 134, 135; Schuster 2016, 240-245; Rodinkova 2018, 671, 675; Hanoshchenko and Volodarec-Urbanovych 2019, 134-139; Gavritukhin 1996, 94, 95; 2005, 434, 435; further literature there).

Bracelets with trumpet-like endings can also be found in the Avar cemeteries dated to the 7<sup>th</sup>-8<sup>th</sup> centuries. Particularly characteristic of the Avar Kaganate material culture are hollow bracelets with enormously widened ends manufactured of silver sheet. They are described as the Szentendre-type and dated to the 7<sup>th</sup> century. These bracelets occur almost exclusively in the territory of the Kaganate; they are regarded as the products of artisans working for the needs of the Avar elites and continuing local Late Roman workshop traditions (Garam 2001, 67-74, 178-183, pl. 1; further literature there). Bracelets with trumpet-like endings manufactured of silver or bronze bars are much less common in Avar cemeteries (Garam 2001, 72-74, fig. 46-47). They are also rare in the northern borderlands of the Kaganate. Primarily, finds from Moravia should be listed here, among them six bracelets from the hoard from Poštorná (today part of Břeclav), dated to the first half of the 7<sup>th</sup> century (Košanr 1994, 70, 71, 97, fig. 1, 2) and a single find from Moravany (a suburb of Brno; Hájek *et al.* 2015, 250, fig. 3). A bracelet with trumpet-like endings was also found in the cremation grave in cemetery Bratislava-Dubravka, dated to the 6<sup>th</sup>-7<sup>th</sup> centuries (Hromada 1991, 282-283, obr. 3; Werner 1991).

There are a relatively significant number of bracelets with trumpet-like endings, predominantly manufactured of a bronze or silver bar, known from the Polish lands. The most numerous assemblage includes eight bracelet fragments (six bronze, two silver) from the excavated stronghold in Hački, Bielsk district. They occurred in the stratigraphic context dated by the radiocarbon method to the 7<sup>th</sup> century (Kobyliński and Szymański 2015, 123-126, fig. 23, 24). Of particular importance is the hoard from Machnów Stary, Tomaszów district. It contained fragments of three bracelets with trumpet-like endings, a bronze trapeze-like pendant, and bronze bars – probably raw material. The deposit is dated to the 7<sup>th</sup>-8<sup>th</sup> centuries and interpreted as the property of a craftsman (Piotrowscy 2010, 76, 77, fig. 1). Preliminary publication of the hoard also contains information about the raw materials of bracelets: bronze, silver, and electrum (Piotrowscy 2010, 76, footnote 9). It is, however, difficult to comment on such statements before the laboratory analysis of chemical composition. Another bracelet was found in an early Slavic stronghold in Szeliği, Płock district, also in the context dated to the 7<sup>th</sup> century (Szymański 1962a, 358, 359, fig. 3). A fragment of a silver bracelet, analogous to bracelet No. 6 from Janowiec, was discovered in Kobylarnia, Międzyzichód district ([sierakowhistorianiecznana.pl/2020/06/27/miejsc/warta-zapomniany-szlak-handlowy/romanchalasz/?highlight=bransoleta](http://sierakowhistorianiecznana.pl/2020/06/27/miejsc/warta-zapomniany-szlak-handlowy/romanchalasz/?highlight=bransoleta)). Regrettably, it is a loose find. Two silver bracelets with widened endings were also found in Lubiewice, Sulęcín district. According to Wojciech Szymański, their form and decoration refer directly to the stylistic features of Szentendre-type Avar bracelets (Szymański 1962b, 288, footnote 17; 1995, 135). Information about further finds from Polish lands made by metal detector users (at least three items) can be found on the Internet, unfortunately without even approximate place of discovery (cf. <https://poszukiwaniemskarbow.com/forum/>). Finally, one should also mention a hollow bracelet made of bronze sheet, found in Biskupin and dated to the late 7<sup>th</sup>-8<sup>th</sup> centuries. W. Szymański recognizes it as a local, simplified replica of silver Szentendre-type bracelets (Szymański 1962b, 288-293; 1995, 134-135).

The relatively broad timeframe widespread of bracelets with trumpet-like endings hinders determining an unambiguous chronology and cultural attribution of the finds from Janowiec. Opportunely, stylistic analysis of decorative patterns provides specific hints.

Bracelets made of silver or bronze bar with ornament analogous to bracelet No. 6 can hardly be found in the relevant literature. It is worth emphasizing that similar decorations are absent in the collection of bracelets from the middle and upper Dnipro River basin. Patterns including lines and stamps in the form of the letter “S” can, however, be found on Avar bracelets of the Szentendre type (*cf.* Nagy 1998a, 381, 425, fig. 20; Garam 2001, 72-74, fig. 46-47; further literature there). One can indicate, among others, a pair of bracelets from Grave 1 in the Csepel-Háros Duna-gát cemetery in Budapest (Sós 1961, 32, fig. 3: 3-4; Nagy 1998b, 144, fig. 99: B: 2-3, 168: 9-12), as well as bracelets from Grave 123 in the cemetery in Gyenesdiás, Zala county (Garam 2001, 69, fig. 45: 6). Given the finds from the area outside the Kaganate, an analogous motif occurred only on the bracelet from Kobylarnia, and the find from an unknown place in Poland, published on the Internet mentioned above.

The decorative pattern of bracelet No. 7 – punctures imitating granulation – appears to be more widespread. Also, in this case, analogies are extremely rare in the Eastern Slavonic territories (*cf.* Hanoshchenko and Volodarec-Urbanovych 2019, 134, fig. 7, 9, 10), although similar motifs frequently occur in Central Europe. Ornament on the bracelet from the post-Roman cemetery at Keszthely-Fenekpuszta, Zala county, dated to the second half of the 5<sup>th</sup> century, can be regarded as one of the oldest examples (Straub 2011, 327-331, 337, fig. 2: 2, Pl. 1:7). It is notable that bands of stamps imitating granulation can also be found in the repertoire of decorative motifs applied on Szentendre-type silver bracelets (*cf.* Garam 2001, 67-74, fig. 42-45; further literature there). Two bracelets decorated with the use of such pattern were found in Grave 31 in the Avar cemetery in Üllő, Pest county (Sós 1955, 196, 208, fig. 59: 1, 2). Analogous stamped ornament also appears on the Moravian finds discussed above – silver bracelets from the Poštná hoard (Košnar 1994, 70, 71, 97, fig. 1, 2), and a single find from Moravany (Hájek *et al.* 2015, 250, fig. 3). Presumably, such a pattern refers to the bracelets, described by Joachim Werner as the Verona type, decorated with the granulation technique. They are dated to the 7<sup>th</sup> century and occur primarily in northern Italy. J. Werner also included to the Verona type several finds from Central Europe, i.e., bracelets from Avar cemeteries in Keszthely (Hungary) and Želiezovce, Levice district (Slovakia), along with the aforementioned bracelet from Bratislava-Dubravka (Werner 1991, further literature there). In turn, analogies to the motif of stamped circles, closing the decorated zone of bracelet No. 7, can be found on the above-mentioned bracelets from Csepel-Háros Duna-gát, also decorated with granulation (Nagy 1998b, 144, Pl. 168: 9-12). Circles embossed with a stamp also decorate the endings of the bracelet from Biskupin, although in this case, they fill the zones delimited by engraved lines (Rajewski 1939, 343, Pl. 65: 1). According to W. Szymański: “the motif of round stamps is probably a vulgarization and a far-reaching simplification of the rhombus with a convex circular eminence in the centre, typical for Hungarian specimens” (Szymański 1962b, 292).

To sum up, silver or bronze bracelets with trumpet-like endings made of metal bars were widespread over vast areas of the territories of the Eastern Slavs between the 6<sup>th</sup> and 8<sup>th</sup> centuries. They also occur in the middle Danube basin, although it should be emphasized that hollow bracelets made of silver sheet predominate in the Avar environment. They appear relatively rarely in the areas neighbouring the Kaganate from the north, interestingly, mainly in Moravia. The recently growing number of bracelet finds from Poland, and their relatively wide territorial range is also noteworthy. However, one should agree with the opinion of Igor Gavritukhin (2005, 434) that the question of provenance, chronology, and stylistic changes of this group of jewellery is still only poorly understood. This hinders establishing the precise dating and cultural attribution of finds from Janowiec. As already mentioned, the results of the analysis of the decoration can be helpful in this case.

Imprints of a stamp in the form of the letter “S” appear almost exclusively in the Avar environment, on Szentendre-type bracelets. Items made of a metal bar decorated with analogous decoration are known, as yet, only from Polish lands; along with find from Janowiec, one should mention the bracelet from Kobylarnia and another one from an unknown place. It cannot be ruled out that the aforementioned finds document local appropriation of the form (significantly enlarged endings) and the stylistic features (stamps filling the space limited by horizontal lines) of Szentendre-type bracelets while maintaining the manufacturing technique traditional for the areas north of the Carpathians (fully cast). The inspiration for the decorative technique imitating granulation probably also derives from the middle Danube basin, where such decorative patterns are present from the Great Migration period until the end of the Avar period. What is more, we can find it both on cast bracelets and items made of sheet.

Both bracelets from Janowiec can be dated approximately to the 7<sup>th</sup>-8<sup>th</sup> centuries and regarded as items manufactured probably in the Slavic milieu but under the strong influence of Avar stylistic features and craftsmanship. Regrettably, the typological and stylistic analyses do not provide an unambiguous answer to whether the bracelets arrived in Janowiec from the territories south of the Carpathian Mountains or were manufactured locally, although certain premises indicate the latter option.

#### 4. METALLOGRAPHIC ANALYSIS

In order to identify the chemical composition of the alloys and manufacturing techniques of the objects, all discovered elements of the belt set and bracelets, along with two bars, remains of the pouring channel and lump of melted metal underwent laboratory analysis. The chemical composition of the samples was investigated with the help of X-ray fluorescence methods, using an ARTAX spectrometer ( $\mu$ XRF) and the Tescan scanning microscope with a PGT analyser (SEM-EDS). The experimental conditions for the Artax spectrometer were as follows: measurement time 100 seconds, voltage 50keV, ambient

atmosphere, Rh lamp, 0.200  $\mu\text{m}$  collimator. BCS standards and copper standards from the Institute of Non-Ferrous Metals in Gliwice were used to calibrate the results. On the SEM microscope, a 100-second measurement time was used in a vacuum at a voltage of 20kV. Each result is the average of several measurements.

Additionally, macroscopic observation and X-ray defectoscopy were also applied. In order to obtain better metal characterisation, measurements were taken on both mechanically cleaned and intact surfaces. The phrase “intact surface” refers to a surface covered with corrosion products, patina, or any coating that has not been cleaned prior to the measurement. The results are summarized in Table 1, while Fig. 6 presents the spots where measurements were taken from. It should be stressed here that this presentation of metallographic analyses is of a preliminary character. The small number of items, their differentiation in terms of their raw materials (copper alloys, silver) and function (belt elements, ornaments, items related to metallurgy) limit both the scope of comparative analyses and detailed interpretations of the results.

The metallic material indicates the use of the casting method to manufacture all the analysed items. Fittings No. 1 and 2 are made of tin-lead bronze (range of determinations: Sn 12.41-26.82%; Pb 3.12-12.57%), appliques No 3-5, in turn, were cast of lead-tin material (range of determinations: Sn 5.40-9.35%; Pb 11.,49-18.35%). A small proportion of zinc, which does not exceed 1.75%, with average percentage of 0.87% is characteristic for all analysed strap fittings elements. Such content does not significantly affect metal properties and should probably be associated with the use of mixed copper ore (Niewęglowski 1986, 313, 314). Rivets fixing the fittings are made of copper alloy with an average Cu content of 96.64% and a small number of contaminations from polymetallic copper ores. Adding lead and tin, slightly reducing the melting point, could intentionally compliment the alloy for some rivets. However, their measured contents, not exceeding 5% of the whole, do not noticeably change the physical properties of pure copper. In all probability, the manufacturer was not aware of the contaminations and wanted to use a different metal for fittings and rivets. He was concerned to obtain metal softer, easier to work with, and applicable at the rivet head. The bronze alloys utilized for casting the fittings are, in turn, appropriate for such castings. They are also characterized by high hardness after solidification and some anti-corrosion properties.

Given the research methods applied, the results of chemical analyses cannot indicate the origin of the raw materials (Pernicka 2014). However, ranges of the main alloy components with the lack of correlation between them, as well as the low levels of residuals from ore smelting indicate metallurgical production based on multiple remelted scraps rather than the use of pure metals. Neither does data on the chemical composition of the alloys provide premises for unambiguous identification of the origin of the analysed fittings. The above-indicated variable proportions of the main alloy components characterize many early medieval metal objects from Central Europe (see, *e.g.*, Doncheva *et al.* 2017, 82-84). It is worth emphasizing, however, that there are similarities between the objects discussed





Fig. 6. Selected places of metallographic analyses: CL20883 (a-d); CL20884 (f-i,k); CL20885 (e); CL20886 (j); CL20887 (l); CL20891 (m); CL20892 (n); CL20893 (o). Photo P. Gan

**Table 1.** Results of the chemical composition analyses of metal objects from Janowiec, Site 3. The results are percentages by weight (wt%), x – measurement below the detection threshold. Prepared by P. Gan

No. CL	Description	Cu	Sn	Zn	Pb	Ag	As	Sb	Au	Fe	Ni	Al	Si	P	S	Bi	Remarks	
20883.01	Fitting	72.01	20.61	0.98	3.12	0.21	0.20	0.25	0.00	0.17	x	x	0.28	1.82	0.32	0.04	Cleaned	
20883.02	Fitting	80.21	12.41	1.75	3.32	0.23	0.23	0.13	0.00	0.15	x	x	0.20	1.08	0.25	0.03	Cleaned	
20883.03	Fitting	70.40	21.63	1.32	5.36	0.42	0.30	0.27	0.00	0.23	0.04					0.04	Uncleaned	
20883.04	Rivet	97.58	1.17	0.55	0.28	0.04	0.06	0.07	0.00	x	x	x	x	x	x	x	0.01	
20883.05	Rivet	94.05	2.49	0.43	2.14	0.07	0.19	0.09	0.00	0.26	x	x	x	x	x	x	0.03	
20884.01	Fitting	70.99	16.86	0.34	9.53	0.16	0.30	0.32	0.00	0.11	0.11	x	0.36	x	0.81	0.13	Yellow coating	
20884.02	Fitting	57.82	26.82	0.43	12.57	0.22	0.39	0.36	0.00	0.14	0.12	x	0.32	x	0.71	0.12	Grey coating	
20884.03	Rivet	57.70	36.90	0.21	3.40	0.20	0.22	0.26	0	0.10	0.09	x	0.29	x	0.61	0.04		
20884.04	Fitting	47.55	22.69	0.40	25.61	0.23	0.91	0.67	0.00	0.19	0.12	x	0.19	x	1.32	0.20	uncleaned	
20884.05	Fitting	68.73	17.48	0.20	12.85	0.16	0.42	0.02	0.00	0.10	0.05	x	x	x	x	0.00	uncleaned	
20884.06	Fitting	63.90	13.78	0.57	20.65	0.22	0.03	0.49	0.01	0.26	0.03	x	x	x	x	0.07	uncleaned	
20884.07	Fitting	67.91	21.32	0.66	9.07	0.17	0.25	0.27	0.00	0.22	0.06	x	x	x	x	0.07	Cleaned	
20885	Bracelet	47.81	1.50	0.39	0.35	49.26	0.01	0.39	0.01	0.29	x	x	x	x	x	0.00	Cleaned	
20886	Bracelet	55.94	0.82	0.66	0.35	41.44	0.01	0.57	0.01	0.20	x	x	x	x	x	0.00	Cleaned	
20891.01	Fitting	74.07	5.24	0.42	18.85	0.13	0.11	0.10	0.00	0.11	x	x	x	x	0.75	0.05	Cleaned	
20891.02	Rivet	96.28	0.36	0.00	1.76	0.09	0.27	0.12	0.00	0.50	x	0.20	0.21	x	0.00	0.06		
20892.01	Fitting	79.13	5.80	1.53	11.49	0.10	0.04	0.08	0.00	0.29	x	0.32	x	0.754	0.31	0.04	Cleaned	
20892.02	Rivet	96.19	1.14	0.00	1.95	0.17	0.07	0.07	0.00	0.21	x	x	x	x	x	0.06		
20892.03	Fitting	83.37	9.35	1.25	5.20	0.10	0.12	0.19	0.01	0.31	x	x	x	x	x	0.02	Uncleaned	
20893.01	Fitting	78.12	5.40	0.76	13.94	0.12	0.06	0.12	0.00	0.22	x	0.32	0.19	0.00	0.53	0.05		
20893.02	Rivet	97.74	0.33	0.00	0.14	0.09	0.10	0.09	0.00	0.27	x	x	0.26	0.83	x	0.04		
20887.01	Lump	74.88	17.52	1.01	5.55	0.20	0.06	0.23	0.00	0.14	0.11	x	0.08	x	0.21	0.02		
20887.02	Melted rivet	96.31	0.47	0.31	0.37	0.00	0.56	0.00	0.04	0.12	x	0.82	0.36	x	0.47	0	SEM-EDS Ti 0.36; Cr 0.09; Mn 0.06	
20887.03	Melted rivet	98.31	0.53	0.00	0.65	0.00	0.00	0.08	0.00	0.14	x	1.67	4.34	x	0.20	0	SEM-EDS Ti: 0.02	
20922	Raw material bar	82.80	4.35	7.43	5.14	0.04	0.02	0.07	0.00	0.09	0.05	x	x	x	x	0.01	Cleaned	
20923	Raw material ar	85.07	10.64	0.16	3.61	0.05	0.10	0.20	0.00	0.11	0.05	x	x	x	x	0.01	Cleaned	
20924.01	Pouring channel	72.18	23.87	1.06	2.47	0.20	x	0.09	0.00	0.07	0.05	x	x	x	x	0.01	Cleaned	
20924.02	Pouring channel	40.81	53.48	0.35	4.25	0.39	x	0.13	0.00	0.55	0.04	x	x	x	x	0.01	Uncleaned	

here and other Late Avar belt elements. The vast majority of them were manufactured of tin or tin-lead bronzes. Such a composition of metal was established, among others, for 14 applications from the Czech Basin (tin – 3.73-21.80%, lead – up to 16.40%; Frána and Maštalka 1992, 782-789), as well as for five fittings from the stronghold in Tismice (tin – 9.42-45.37%, lead – 0.9-15.49%; Profantová 2020, 169). Among the finds from Slovakia, a series of 44 fittings from the cemetery in Obid should be mentioned (Tirpák and Tirpaková 2019, 333), along with ten appliques from the cemetery in Valaliky-Všechsvätých (tin – 4.10-20.55%, lead – 0.38-62.13%), and 34 fittings from the hoard discovered in Dolné Orešany (tin – 2.07-54.38%, lead – 6.49-24.20%; Pieta and Ruttkay 2017, 543-545). From among the Avar finds from Polish lands, only the belt fitting from Czermno has been subjected to laboratory analysis. It was cast from bronze, with the share of tin reaching 16% (Wołoszyn *et al.* 2016, 707).

Only a few analyses indicate brass as the raw material of fittings dated to the period in question. Primarily, this concerns the appliqué from Grębocice with a 10% zinc content, although the artefact does not have close analogies in Late Avar materials, and researchers associate it with Great Moravian influences (Jaworski *et al.* 2012, 34). However, the zinc level does not usually exceed 2% in the alloy; hence, it can be interpreted as contamination derived from ores or a component of repeatedly remelted scrap metal, the content of which was unknown to the caster.

On the other hand, levels of silver increased by about 1% among the majority of analysed objects, most probably evidence the use of inaccurately refined lead ores. This corresponds with the opinion of Falko Daim (1987, 168), according to which Avar artisans prepared small portions of the alloy, which explains the significant variation in the chemical composition. It can also be added that the alloy with a high proportion of low-melting metals (melting point for Sn is 232°C, for Pb 327.5°C) allowed the lowering of the melt temperature and, above all, improvement of the casting properties.

Specific difficulties related to the interpretation of relatively high Sn/Pb contents should be stressed here. In the opinion of many researchers, such high values indicate the existence of a tin coating, which of course, is possible. It should be emphasized, however, that mixtures of two or more structural components (*e.g.*, Cu/Sn/Pb) usually characterize themselves by a disturbed external appearance, different colours, and heterogeneous internal structure, which is related to the long-term temperature range of the alloy solidification and gradual separation of phases. In turn, tin properties favour the formation of patina layers enriched with it during naturally occurring corrosion processes. A similar saturated surface layer may also be formed under favourable conditions during the metallurgical process (Meeks 1986, 133). Undoubtedly, the surface analysis is not sufficient to confirm the existence of such a coating without visible external traces, and examination of cracks, and flaking fragments. For this purpose, cuts on sections appear to be necessary, although such a method physically interferes with the object's structure.

Such a question deserves mentioning since the differentiation in surface measurements was also registered in the case of the fittings from Janowiec. Areas covered with grey



Fig. 7. Bars of raw material cleaned of patina at the measurement points with visible colour differentiation: CL20922 – multi-component alloy CuZnSnPb (a), CL20923 – tin-lead bronze alloy (b). Photo P. Gan

bloom (approx. 26% Sn), as well as zones with a clear yellow colour (approx. 16% Sn), are visible on the surface of fitting No. 2 (CL20284), while measurements from the additionally cleaned measuring point revealed over 20% Sn. A simple explanation for such a differentiation is the phenomenon of tin segregation occurring in the cast and non-homogeneous alloys. It should be assumed that after obtaining the cast, further processing was limited to surface retouching and rivet forging. The working of tin high-tin alloys is in principle only possible with the use of a “hot” method. A noticeable difference in the Sn/Pb proportions (tin-lead bronze versus lead-tin bronze) have been registered for bigger and smaller fittings. Apparently, in the case of larger and more complex objects, the craftsman added a more significant portion of low-melting raw material to better fit the mould than in smaller applications. In the case of the latter ones, he could also replace the less-available tin with relatively cheap and readily available lead.

The analyses of two raw material bars also produced interesting results. One of them (No. 8) was made of a yellow-coloured multicomponent alloy (Cu-Zn-Sn-Pb), while the other one (No. 9) was identified as tin-lead bronze, similar to the analysed fittings. Bars could be a standard form of raw material contained in a crucible, and the colour differences facilitated obtaining a specific alloy recipe (Fig. 7). The chemical composition of the pouring channel of a mould (No. 10) can be determined as tin-lead bronze, corresponding to the analysed fittings. The chemical composition of the molten metal lump (No. 11) also correlates with other appliquéés. Therefore, the lump in question can be considered a fragment of another fitting.

Two fragments of bracelets derive from products made of low-quality silver. Both alloys were contained over 40% copper, which undoubtedly influenced the weight and external appearance, with many surface pits. The significant addition of copper significantly reduced the gloss, increased the hardness of the silver that hindered striking decorative patterns, and made it difficult to melt. It remains unclear whether this was the result of the artisan’s decision, or an effect of his inability, or desire, to spare the raw material. The

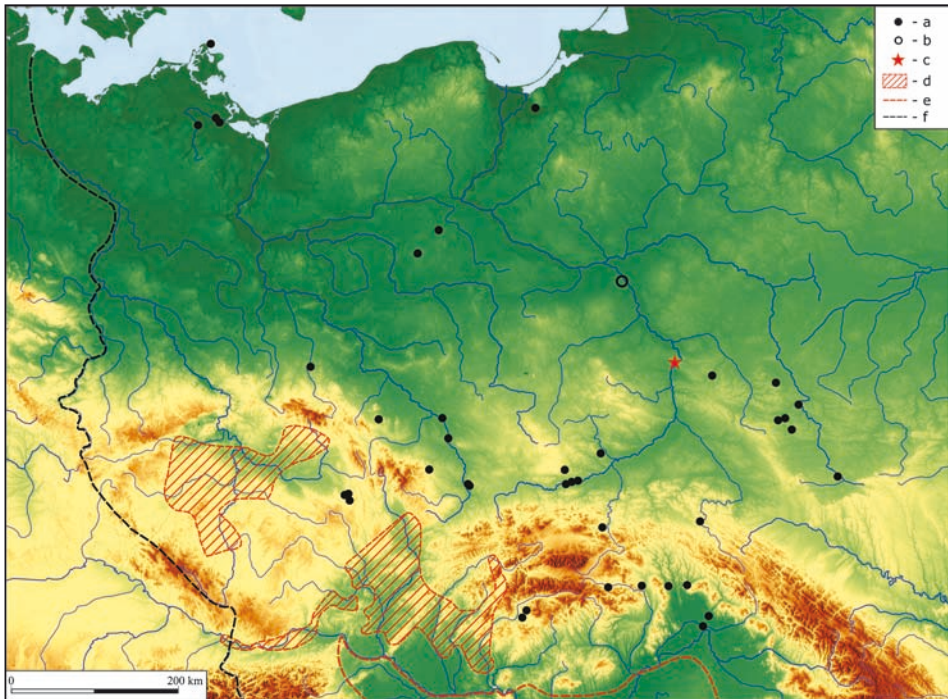
possibilities of a comparative analysis of the chemical composition of bracelets from Janowiec and similar artefacts are limited. A series of laboratory tests performed for silver bracelets from the stronghold in Haćki should be mentioned here at first. It is noteworthy that they revealed a similar copper-silver chemical composition of raw material (*cf.* unpublished analyses from the archives of the Laboratory of Bio- and Archaeometry of the Institute of Archaeology and Ethnology Polish Academy of Sciences, order No. 568/89).

## 5. CONCLUSIONS

The results of typological analyses and laboratory tests allow for, at least preliminary, hypotheses on the origin of the finds, the circumstances, and the reasons for which they found themselves in the middle Vistula River basin. Metal elements of an Avar beltset form the most numerous group in the discussed collection of finds. They can be relatively reliably dated to between the mid-8<sup>th</sup> and early 9<sup>th</sup> century, and have numerous and well-documented analogies, both from the territories of the Kaganate and the lands under its political and cultural influence..

In the areas of today Poland, Late Avar belt fittings are still rare, although we should point to a gradual increase of such a group of finds. As a rule, we are dealing with single items; the exceptions include series of two (Pełczyska, Pińczów district and Swaryczów, Zamość district), three (Naszacowice) or four (Gródek upon the Bug River) items (*cf.* Poleski 2013a, 342-344; 2013b, 218 ff). Thus, Site 3 in Janowiec has produced the largest collection of metal elements of the Avar beltset from Polish lands. It is noteworthy that after submitting this text for publication, three more applications, similar to the fittings 4 and 5 discussed here, were discovered during the surveys at Site 3 in Janowiec in 2022.

Distribution analysis indicates three distinct clusters of such finds in Polish lands: in the upper Odra River at the mouth of the Moravian Gate, in western Lesser Poland (vicinity of Kraków), and the area between the upper Bug and middle Vistula (Fig. 8). Apparently, the finds from Janowiec appear to be related to the last two groups, and the element connecting them is the course of the Vistula River. Researchers discuss various interpretations of the influx of Late Avar finds to the area north of the Carpathians. Both direct military and commercial contacts with the Avars are taken into account, as well as the long-range exchange organized by the Slavic elites formed in the 8<sup>th</sup>-9<sup>th</sup> centuries in Moravia and the Czech Basin, intermediating in contacts with the Kaganate. It cannot be ruled out that the Late Avar bronzes appeared there as “spoils of war” gained by the Slavs after the fall of Avar rule – either as personal loot or as an object of trade (see *e.g.*, Poleski 2013a, 344, 345, further literature there). It is also difficult to assess the role played by the Late Avar belt fittings in the Slavic communities inhabiting the lands north of the Carpathians. Undoubtedly, their influx was associated with the formation of “tribal” elites. However, how they adapted the elements of the Avar costume is debatable.



**Fig. 8.** Finds of artefacts linked with the culture of the Late Avar Khaganate in Western Slavic territories located to the north of the Khaganate. Legend: a – Late Avar finds; b – find with uncertain localization; c – Janowiec; d – areas of high concentration of the Late Avar metalwork outside the territory of the Khaganate; e – reach of the Late Avar bi-ritual burial grounds (territory of the Khaganate); f – eastern border of the Carolingian Empire administration ca. 803–828.

After: Poleski 2013a, Robak 2018; prepared by G. Kuś (base: <https://maps-for-free.com/>)

Given that the vast majority of finds comprise single items, it cannot be ruled out that single Avar fittings played the role of personal decorations, perhaps not necessarily placed on the belt. It cannot also be ruled out that they were primarily a source of raw material and were imported for this purpose (*cf.*, *e.g.*, Szymański 1962b, 309–311; Profantová 1992, 621 ff; Poleski 2003, 217 ff; Robak 2018, 56–63, further literature there). It should be thus highlighted that four fittings from Site 3 are in all likelihood elements of a single beltset. Furthermore, the relatively good condition of the rivets may indicate that not only the fittings were brought to Janowiec, but entire belts or their large fragments.

The chronology and provenance of the bracelets with trumpet-like endings are more challenging to establish. The stylistic and technological analyses indicate their relationship with Early Slavic material culture, although with the apparent influence of the Avar style. Following the current state of research, their chronology can be generally referred to as the 7<sup>th</sup> and 8<sup>th</sup> centuries. Finds from the upper Bug River basin, such as the hoard from

Machnów Stary or items from the stronghold in Zimnye, Volodymyr-Volynskyi district, suggest that bracelets discussed here can be considered as imports from this region. Bracelets from Moravia, including the hoard from Poštorna, may indicate an alternative direction. Eventually, it cannot be ruled out that the bracelets were manufactured in Polish lands for the needs of local elites. Given the current state of research, it can only be stated that their form and decoration are consistent with a broader stylistic trend, combining ancient, early Slavic, and nomadic traditions, covering a vast territory from Middle Dnipro through the Carpathian Basin and the lands on the central Danube, up to the Vistula and Oder basins.

The context of discovery hinders an unequivocal answer whether the finds discussed here can be regarded as an assemblage or represent different chronological horizons. It cannot be ruled out that the bracelets arrived in Janowiec earlier than the strap fittings, perhaps even in the 7<sup>th</sup> century, while the appliqués could not have been brought there earlier than the last decades of the 8<sup>th</sup> century. Adopting a different time of influx of the discussed items, which – taking into account the local cultural context – can be considered as material indicators of the elites, would suggest a unique role of Site 3 in Janowiec in the social structures and settlement network of the central Vistula basin between the 7<sup>th</sup> and early 9<sup>th</sup> centuries. Regrettably, we lack other material traces that could support such a hypothesis. The vast majority of Early Medieval objects and finds from Site 3 represent a much later horizon, dating to the 11<sup>th</sup>-12<sup>th</sup> centuries. The excavations revealed only one feature containing a few fragments of hand-made pottery, which can be dated to the 7<sup>th</sup>-8<sup>th</sup> centuries according to a preliminary assessment. Another dozen or so potsherds dated generally to the older phases of the early Middle Ages, found in a secondary deposit, have been discovered during the excavations in the centre of Janowiec, about two km from Site 3 (Trzeciński 2012). One might argue that such a humble picture is the result of the low level of investigation of the Early Medieval settlement in the area in question. It should be emphasized, however, that the entire territory on the left bank of the Vistula River, between Janowiec and Radom, has not provided finds documenting the existence of a settlement network older than the late 9<sup>th</sup> century (Cieślak-Kopyt *et al.* 1994; Auch *et al.* 2019, 104 ff). A totally different situation was recorded on the right bank of the Vistula in the immediate vicinity of Janowiec. The settlement in Puławy-Włostowice from the 7<sup>th</sup>-9<sup>th</sup> centuries, located only five km northeast of Janowiec, should be mentioned here (Lis 2018, 684-688). However, the settlement complex in the Chodelka River basin, the origins of which may even date back to the 6<sup>th</sup> century, deserves much more attention. The centre of this micro-region was the stronghold in Chodlik, erected probably in the late 8<sup>th</sup> century, one of the oldest and most prominent sites of this type in Lesser Poland. Excavations, conducted for over half a century, have provided considerable material evidence of far-reaching contacts, although so far, no objects of Late Avar provenance have been found there (Hoczyk-Siwkowska 2004, 64-65; Miechowicz 2018, 27 ff, further literature there). We can thus assume that slight traces of settlement in Janowiec should be associated with the Chodlik settlement complex.

The hypothesis on the relationships between the finds and alleged potential “tribal” period elite seat in the Janowiec area appears, therefore, barely plausible. It is important to highlight that the present research stage hinders even initial interpretations of the circumstances in which the discussed artefacts found their way to Site 3 in Janowiec. Metallographic analyses also contribute little here. Noteworthy, the place of finding can, however, provide some indirect evidence. Site 3 is located near the crossing over the Vistula, opposite the mouth of the Chodelka River, the natural axis of the aforementioned Chodlik settlement complex. It thus appears probable that the items discussed here constitute a material trace of the flow of goods stimulated by the local “tribal” elites concentrated around the stronghold in Chodlik. The finds document intensification of supra-regional contacts, favoured by the collapse of the Kaganate and the overwhelming impact of Avar cultural patterns. Simultaneously, they indicate the importance of the upper and middle Vistula as a natural communication axis connecting the “tribal” centres of power in the Kraków land and the north-eastern Lesser Poland.

## References

- Auch M., Skorupska P. and Trzeciecki M. 2019. *Osada na stanowisku 4 (= Przestrzeń osadnicza uczesnośredniowiecznego Radomia 2)*. Warszawa: Instytut Archeologii i Etnologii PAN.
- Bárdos E. and Garam E. 2014. *Das awarenzeitliche Gräberfeld in Zamárdi-Rétiföldek (= Monumenta Avarorum Archaeologica 10)*. Budapest: Magyar Nemzeti Múzeum.
- Bargiel B. and Zakościelna A. 1995. *Kolekcja Katedry Archeologii Uniwersytetu Marii Skłodowskiej-Curie w Lublinie 1 (= Katalog Archeologicznych Zbiorów Pozamuzealnych 3)*. Warszawa: Ośrodek Dokumentacji Zabytków.
- Bugarski I. 2015. Axe, Battle Axes and Battle Knives from Avar-Time Graves in Vojvodina. In C. Cosma (ed.), *Warriors, weapons, and harness from the 5<sup>th</sup>-10<sup>th</sup> centuries in the Carpathian Basin (= Ethnic and cultural interferences in the 1<sup>st</sup> millennium B.C. to the 1<sup>st</sup> millennium A.D. 22)*. Cluj Napoca: Mega Publishing House, 129-146.
- Cieślak-Kopyt M., Mücke I., Skubicha E. and Twardowski W. 1994. *Radomskie – alfabet wykopalisk. Przewodnik archeologiczny*. Radom: Muzeum im. Jacka Malczewskiego.
- Csallány D. 1957. Az Átokháza-bilisicsi avarkori sírleletek. Grabfunde aus der Awarenzeit von Átokháza-Bilisics. *A Móra Ferenc Múzeum Évkönyvei* 1957, 109-130.
- Daim F. 1987. *Das awarische Gräberfeld von Leobersdorf, Niederösterreich*. Wien: Verlag der Österreichischen Akademie der Wissenschaften.
- Doncheva S., Penev I., Tsekova G., Furu E., Szikszai Z. and Uzonyi I. 2017. Elemental Composition of Artefacts Found at the 10<sup>th</sup> Century Decorative Metalwork Centre near Nadarevo. *Archaeologia Bulgarica* 21/1, 75-88.
- Erdélyi I. 1958. *A jánoshidai avarkori temető (= Régészeti Füzetek 12/1)*. Budapest: Magyar Nemzeti Múzeum – Történelmi Múzeum.



- Frána J. and Maštalka A. 1992. Röntgenfluoreszenzanalyse von frühmittelalterlichen Bronzen aus Böhmen und Mähren. In F. Daim (ed.), *Awarenforschungen* 2. Wien: Institut für Ur- und Frühgeschichte der Universität, 779-802.
- Fettich N. 1965. Das awarenzeitliche Gräberfeld von Pilismarót-Basaharc (= *Studia archaeologica* 3). Budapest: Akadémiai Kiadó.
- Garam É. 1975. The Szobény I-III Cemetery. In É. Garam, I. Kovrig, J. Gy. Szabó and Gy. Török (eds), *Avar finds in the Hungarian National Museum (= Cemeteries of the Avar period (567-829) in Hungary* 1). Budapest: Akadémiai Kiadó, 49-120.
- Garam E. 2001. *Funde byzantinischer Herkunft in der Awarenzeit vom Ende des 6. bis zum Ende des 7. Jahrhunderts (= Monumenta Avarorum Archaeologica* 5). Budapest: Magyar Nemzeti Múzeum.
- Gavritukhin I. O. 1996. Datirovka dneprovskikh kladov pervoy gruppy metodom sinkhronizatsii s drevnostiami drugikh territoriy. In I. O. Gavritukhin and A. M. Oblomskiy (eds), *Gaponovskiy klad i ego kulturno-istoricheskii kontekst (= Rannoslavianskiy mir* 3). Moskva: Institut arkheologii RAN, 58-95.
- Gavritukhin I. O. 2005. Kompleksy prazhskoy kultury s datiruyushchimi veshchami. In P. Kaczanowski and M. Parczewski (eds), *Archeologia o początkach Słowian. Materiały z konferencji, Kraków, 19-21 listopada 2001*. Kraków: Księgarnia Akademicka, 401-461.
- Hampel J. 1894. *A régibb középkor (IV-X. század) emlékei Magyarhonban I*. Budapest: M. T. Akadémia.
- Hanoshchenko V. V. and Volodarec-Urbanovych I. A. V. 2019. Skarb kola Martynivky z Pravykh Solontsiv Khersonskoi oblasti. *Arkheologia i davna istoria Ukrainy* 3(32), 126-150.
- Hájek et al. 2015. Hájek Z., Čížmářová J. and Kühn M. 2015. Moravany (k. ú. Moravany u Brna, okr. Brno-venkov). *Přehled Vyzkumů* 57/1, 250.
- Hoczyk-Siwkova S. 2004. *Kotlina Chodelska we wcześniejszym średniowieczu: studium archeologiczno-osadnicze*. Lublin: Wydawnictwo UMCS.
- Hromada J. 1991. Včasnoslovanské žiarové pohrebisko v Bratislave-Dúbravke. *Slovenská archeológia*, 37(1-2), 277-284.
- Kobyliński Z. and Szymański W. 2015. Grodzisko w Haćkach na Podlasiu. In M. Żurek and M. Krasna-Korycińska (eds), *Grody średniowiecznego Mazowsza. Księga poświęcona pamięci Marka Dulnicza (= Archaeologica Hereditas* 4). Warszawa, Zielona Góra: Instytutu Archeologii UKSW, Instytut Archeologii i Etnologii PAN, 111-145.
- Kondracki J. 2002. *Geografia regionalna Polski*. Warszawa: Wydawnictwo Naukowe PWN.
- Košnar L. 1994. Raně středověký depot stříbrných předmětů z Poštorné, okr. Břeclav. *Varia Archaeologica* 6 (= *Praehistorica* 21), 69-103.
- Kovrig I. 1975. The Szob Cemetery. In É. Garam, I. Kovrig, J. Gy. Szabó and Gy. Török (eds), *Avar finds in the Hungarian National Museum (= Cemeteries of the Avar period (567-829) in Hungary* 1). Budapest: Akadémiai Kiadó, 157-208.
- Kuś G. 2021. Zapinki bałtyjskie z Janowca nad Wisłą. *Wiadomości Archeologiczne* 72, 194-199.
- Lis P. 2018. Osadnictwo wczesnośredniowieczne. In B. Niezabitowska-Wiśniewska (ed.), *Puławy-Włostowice. Wielokulturowe stanowisko z zachodniej Lubelszczyzny*. Lublin: Wydawnictwo UMCS, 680-711.

- Meeks N. D. 1986. Tin-rich surfaces on bronze – some experimental and archaeological considerations. *Archaeometry* 28/2, 133-162.
- Miechowicz Ł. 2018. Wczesnośredniowieczne grody w Kotlinie Chodleskiej. In E. Banasiewicz-Szykuła (ed.), *Grody z okresu plemiennego na Lubelszczyźnie*. Lublin: Wojewódzki Urząd Ochrony Zabytków w Lublinie, 25-70.
- B. Nagy K. 2003. *A székkutas-kápolnadűlői avar temető*. (= *A Móra Ferenc Múzeum Évkönyve: Monographia Archeologica* 1). Szeged: A Móra Ferenc Múzeum.
- Nagy M. 1998a. Ornamenta Avarica I. Az avar kori ornamentika geometrikus element. *A Móra Ferenc Múzeum Évkönyve: Studia Archaeologica* 4, 377-459.
- Nagy M. 1998b. *Awarenzeitliche Graberfelder im Stadtgebiet von Budapest* (= *Monumenta Avarorum Archaeologica* 2). Budapest: Magyar Nemzeti Múzeum.
- Niewęgłowski A. 1986. Problemy i metody metaloznawczych badań starożytnych wyrobów z miedzi i jej stopów. *Kwartalnik Historii Kultury Materialnej* 34/2, 289-329.
- Petrinec M. 2009. *Gräberfelder aus dem 8. bis 11. Jahrhundert im Gebiet des frühmittelalterlichen kroatischen Staates* (= *Monumenta Mediaevali Croatiae* 3). Split: Museum der kroatischen archäologischen Denkmäler.
- Pernicka E. 2014. Provenance determination of archaeological metal objects. In B. W. Roberts and C. P. Thornton (eds), *Archaeometalurgy in global perspective: methods and syntheses*. New York: Springer, 239-268.
- Pieta K. and Ruttkay M. 2017. Ein Hort spätawarischer Bronzen aus Dolne Orešany in der Westslowakei. In B. Eriksen, A. Abegg-Wigg, R. Bleile and U. Ickerodt (eds), *Interaktion ohne Grenzen. Beispiele archäologischer Forschungen am Beginn des 21. Jahrhunderts*. Schleswig: Archäologisches Landesamt Schleswig-Holstein, 541-554.
- Piotrowscy P. and M. 2010. Średniowieczne depozyty. In E. Banasiewicz-Szykuła (ed.), *Skarby Lubelszczyzny* (= *Skarby z Przeszłości* 11). Lublin: Wojewódzki Urząd Ochrony Zabytków w Lublinie, 73-111.
- Poleski J. 2003. Kolejne zabytki awarskie i wielkomorawskie z grodziska w Naszacowicach. In M. Dulnicz (ed.), *Słowianie i ich sąsiedzi we wczesnym średniowieczu*. Lublin, Warszawa: UMCS, Instytut Archeologii i Etnologii PAN, 215-222.
- Poleski J. 2013a. Transkarpackie kontakty mieszkańców Małopolski w VII-X w. n.e. In J. Garncarski (ed.), *Transkarpackie kontakty kulturowe w okresie lateńskim, rzymskim i wczesnym średniowieczu*. Krosno: Muzeum Podkarpackie w Krośnie, 293-380.
- Poleski J. 2013b. *Małopolska w VI-X wieku. Studium archeologiczne*. Kraków: Historia Iagiellonica.
- Profantová N. 1992. Awarische Funde aus den Gebieten nördlich der awarischen Siedlungsgrenzen. In F. Daim (ed.), *Awarenforschungen* 2. Wien: Institut für Ur- und Frühgeschichte der Universität, 605-778.
- Profantová N. 2015. Nová raně středověká výšinná poloha z Kosoře a Prahy-Radotína. In J. Podliska (ed.), *V za(u)jetí malostranských stratigrafií. Sborník k životnímu jubileu Jarmily Čihákové*. Praha: Nová tiskárna Pelhřimov, 80-95.

- Profantová N. 2020. Hillforts with collections of Avar Khaganat Period finds in Bohemia. Some interpretation models. In M. Diesenberger, S. Eichert and K. Winckler (eds), *Der Ostalpenraum im Frühmittelalter. Herrschaftsstrukturen, Raumorganisation und archäologisch-historischer Vergleich (= Forschungen zur Geschichte des Mittelalters 23)*. Wien: Österreichischen Akademie der Wissenschaften, 163-170.
- Profantová N., Křivánek R., Fikrle M. and Zavřel J. 2020. Tismice jako produkční a nadregionální centrum Čech 8. a 9. století. *Památky Archeologické* 111, 193-271.
- Rajewski Z. 1939 (1948). Zabytki awarskie z Biskupina w pow. żnińskim. *Wiadomości Archeologiczne* 16, 341-347.
- Robak Z. 2018. Carolingian or not? An Analysis of the Fitting from Haliczany in the Context of other Early Medieval Finds from Selected Areas of the Western Slavic Territories. *Slovenská archeológia* 66(1), 49-105.
- Rodinkova V. E. 2018. Early Slavic Hoards of the Dnieper Region (on the nature and the historical significance of the phenomenon). In B. Niezabitowska-Wiśniewska, P. Łuczkiwicz, S. Sadowski, M. Stasiak-Cyran and M. Erdrich (eds), *Studia Barbarica: Profesorowi Andrzejowi Kokowskiemu w 65. rocznicę urodzin*. Lublin: Wydawnictwo UMCS, 670-679.
- Schuster J. 2016. The Świltza Hoard. An extraneous 5th Century AD Complex from the Northern Carpathian Foreland. *Wiadomości Archeologiczne* 67(1), 227-262.
- Solon J., Borzyszkowski J., Bidłasik M., Richling A., Badora K., Balon J., Brzezińska-Wójcik T., Chabudziński Ł., Dobrowolski R., Grzegorzczak I., Jodłowski M., Kistowski M., Kot R., Kraż P., Lechnio J., Macias A., Majchrowska A., Malinowska E., Migoń P., Myga-Piątek U., Nita J., Papińska E., Rodzik J., Strzyż M., Terpilowski S. and Ziaja W. 2018. Physico-geographical mesoregions of Poland: Verification and adjustment of boundaries on the basis of contemporary spatial data. *Geographia Polonica* 91/2, 143-170.
- Cs. Sós Á. 1955. Le deuxième cimetière avar d'Üllő. *Acta Archaeologicae Academiae Scientiarum Hungariae* 6, 193-230.
- Cs. Sós Á. 1961. Újabb avar kori leletek Csepel szigetéről. *Archaeologiai Értesítő* 88, 32-51.
- Straub P. 2011. Angaben zum hunnenzeitlichen ostgermanischen Fundhorizont in Südtransdanubien – ausgehend von der Nekropole in Keszthely-Fenekpuszta. In O. Heinrich-Tamáska (ed.), *Keszthely-Fenekpuszta im Kontext spätantiker Kontinuitätsforschung zwischen Noricum und Moesia (= Castellum Pannonicum Pelsonense 2)*. Budapest, Leipzig, Keszthely, Rahden: Magyar Tudományos Akadémia Régészeti Intézete, Geisteswissenschaftliches Zentrum, Geschichte und Kultur Ostmitteleuropas e. V., Balatoni Múzeum, 325-345.
- Szente G. 2013. Vegetal ornaments in the Late Avar decorative art. *Dissertationes Archaeologicae ex Instituto Archaeologico Universitatis de Rolando Eötvös nominatae* 3/1, 303-320.
- Szimonova E. 1972. Toponár, Fészerlak-puszta (Kom. Somogy, Kr. Kaposvár) Awarisches Gräberfeld. *Mitteilungen des Archäologischen Instituts der Ungarischen Akademie der Wissenschaften* 3, 161-163.
- Szőke B. M. 2001. Egy avar kori indavirág Késő avar kori övgarnitúra Zalaegerszeg-Ola, Új kaszárnya területéről. *Zalai Múzeum* 10, 103-140.

- Szöke B. M. 2008. Veränderungen in der Struktur des awarischen Gürtels. *Antaeus. Communicationes ex Institute Archaeologico Academiae Scientiarum Hungaricae* 29-30, 175-213.
- Szymański W. 1962a. Wyniki badań grodziska z VI-VII w. w miejscowości Szeliği, pow. Płock na Mazowszu. *Światowit* 24, 353-371.
- Szymański W. 1962b. Uwagi w kwestii zabytków awarskich znalezionych na terenie Polski. *Archeologia Polski* 7, 282-314.
- Szymański W. 1995. Stan wiedzy o zabytkach awarskich z obszarów położonych na północ od terytorium kaganatu. *Archeologia Polski* 40/1-2, 125-146.
- Tirpák J. and Tirpáková A. 2019. Röntgenová fluorescenčná analýza predmetov z pohrebiska z obdobia avarského kaganu v Obide. In J. Zábojník, *Pohrebisko z obdobia avarského kaganátu v Obide*. Bratislava, Nitra, 291-334.
- Tirpák J. 2016. Röntgenová fluorescenčná analýza predmetov z pohrebiska z obdobia avarského kaganu vo Valalikoch-Všechsvätých. In J. Zábojník and J. Béreš (eds), *Pohrebisko z obdobia avarského kaganátu vo Valalikoch-Všechsvätých*. Nitra: Archeologický ústav Slovenskej akadémie vied, 246-278.
- Trzeciecki M. 2012. *Janowiec nad Wisłą. Wykaz ceramiki wczesnośredniowiecznej z badań archeologicznych prowadzonych na terenie miasta*. Warszawa, maszynopis w archiwum IAE PAN.
- Turek R. 1950. K počátkům Prahy. *Památky archeologické* 43, 59-94.
- Werner J. 1991. Expertise zu dem Bronzearmring mit verdickten Enden und Perleisten von Bratislava-Dubravka. *Slovenská archeológia* 37/1-2, 287-288.
- Wołoszyn M., Florkiewicz I., Dzieńkowski T., Sadowski S. Nosek E. M. and Stępiński J. 2016. Cherven before Cherven Towns. Some remarks on the history of the Cherven Towns area (Eastern Poland) until the end of 10th century. In Á. Bollók, G. Csiky and T. Vida (eds), *Zwischen Byzanz und der Steppe. Archäologische und historische Studien. Festschrift für Csanád Bálint zum 70. Geburtstag/Between Byzantium and the Steppe: Archaeological and Historical Studies in Honour of Csanád Bálint on the Occasion of His 70<sup>th</sup> Birthday*. Budapest: Institute of Archaeology, Research Centre for the Humanities Hungarian Academy of Sciences, 689-716.
- Zábojník J. 1991. Seriation von Gürtelbeschlaggarnituren aus dem Gebiet der Slowakei und Österreichs (Beitrag zur Chronologie der Zeit des awarischen Kaganats). In Z. Čilinská (ed.), *K problematike osídlenia stredodunajskej oblasti vo včasnóm stredoveku*. Nitra: Archeologický ústav SAV, 219-321.
- Zábojník J. 2019. *Pohrebisko z obdobia avarského kaganátu v Obide*. Bratislava, Nitra: Archeologický ústav SAV.
- Zaharia E. 1977. *Populația romanească în Transilvania în secolele VII-VIII. Cimitirul nr. 2 de la Bratei*. București: Editura Academiei Republicii socialiste România.