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WAS THERE A BRONZE WORKSHOP AT THE 'TARGOWISKO' (SITE 4) SETTLEMENT AT SZURPIŁY NEAR JELENIEWO?

Abstract: During archaeological excavations on the 'Targowisko' settlement at Szurpiły a number of objects were found that seem to be connected to the activities of a bronze workshop. The finds clustered in particular in the trench made during 2006 located on ares 38-42 and 37-43. In spite of absence of any remains of casting furnaces or crucibles the finds unambiguously point to local metalworking activity, primarily by smithing. Bronze working was presumably seasonal in nature and may have taken place in several places around the settlement, although most of the materials cluster in 38-42 and 37-43. The dominant raw material for the production of ornaments was copper alloys, most likely from waste and reused necklaces. Production was focused on meeting local demand for such items as: brooches, rings, bracelets, necklaces and pendants. Small repairs were also undertaken. Preliminary research leads to conclusion that the workshop or workshops were functional between the eleventh and thirteenth centuries AD.

Key words: Szurpiły, Yotvingia, bronze workshop, archaeometallurgy

In the early middle ages the settlement complex in the village of Szurpiły near Jeleniewo, some 15 km north of Suwałki, was one of the most important centres of Yotvingia. 'Targowisko' (st. 4) is the largest settlement of the complex, centred on the hillfort on the Góra Zamkowa (Castle Hill). The complex is surrounded by three lakes: Szurpiły with the Czarne bay, Jeglówek and Tchliczysko [Fig. 1].

In 1980 an archaeological expedition under Professor Jerzy Okulicz-Kozaryn came to Szurpiły. The first trenches were dug at 'Targowisko' in 1981. In the spring of 1982 surface surveys and detailed mapping were carried out. They allowed for the extent of the settlement to be determined. Archaeological excavations continued all the way to 1990 with the only break in 1989.

The next stage of work at the site started in 2003–2004 when 'Project Szurpiły' was set up by the Department for Archaeology of the Balts of the National Museum of Archaeology and Archaeology Institute of the Warsaw University. The research team's activities aimed to publish a monograph of the Szurpiły settlement complex on the basis both of Professor Jerzy Okulicz-Kozaryn's archival materials and new finds. In 2005 non-invasive surface surveys were carried out using metal detectors and mapping was repeated. In 2006 and 2007 new trenches were dug at 'Targowisko' under the direction of Ludwika Jończyk, MA of the Warsaw University and Dr Marcin Engel of the National Museum of Archaeology. In the spring of 2008 geophysical surveying and prospecting with metal detectors were carried out in cooperation with researchers of the university of Kiel. In the summer of that year verifying excavations were carried out in the settlement's southern part,

where geomagnetic surveys showed strong anomalies. Disposal pits and the remains of an oven of an unclear function were found. In the spring of 2010 as yet another, the last so far, stage of metal-detector prospecting was carried out at the 'Targowisko' settlement.[1]

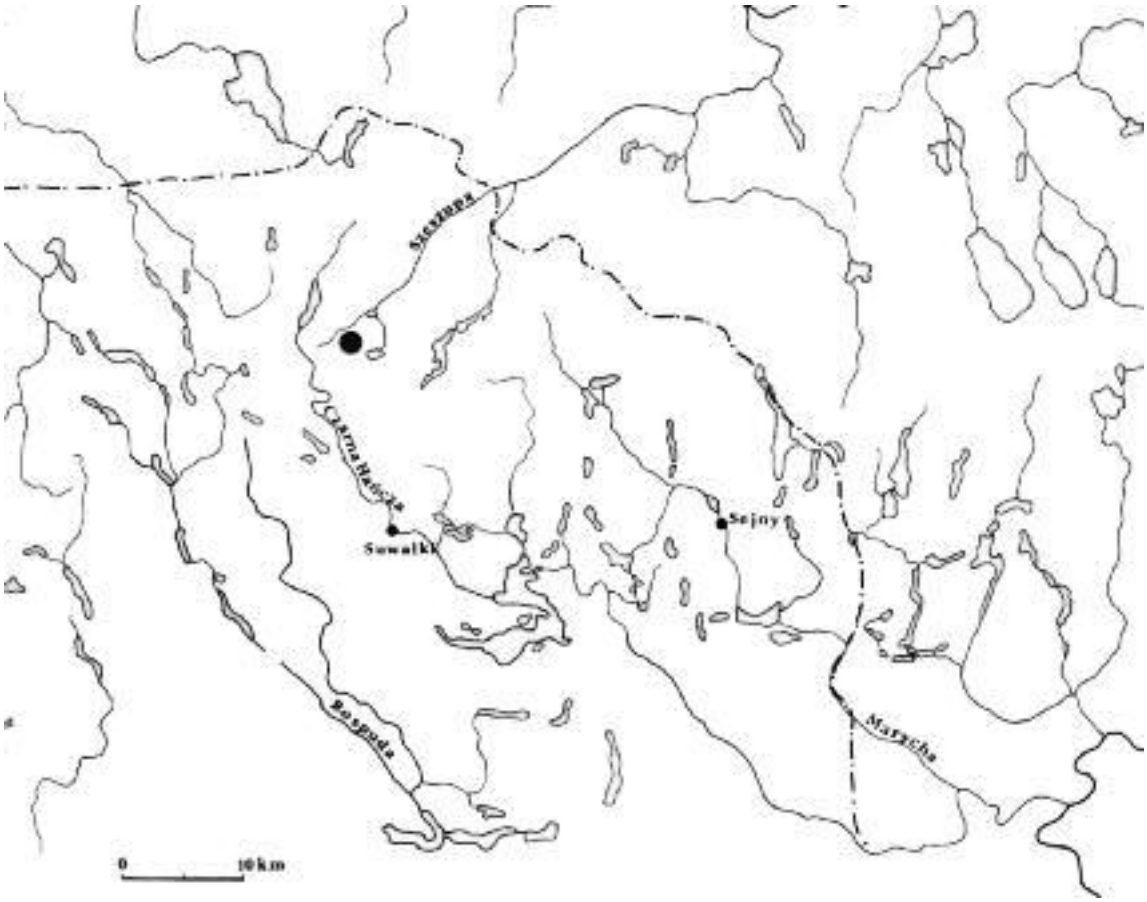

Fig. 1. Location of site (according to L. Jończyk)

In the course of archaeological research a large number of frequently very fragmented objects of copper alloys were found all over the site. Some, such as lumps of melted metal, plate or wire fragments or spoilt products of casting, could be considered waste or intermediate products. In the season of 2006 a particular concentration of finds of this type was found in one trench in the ares 38-42 and 37-43 [Figs. 2 & 3]. In addition to waste products [Fig. 4: 1 & 2] the trench also contained an interesting group of finished finds, primarily jewellery and clothing elements, which shed new light on the functioning of the presumed workshop. The first group includes four penannular brooches with bent endings, made of an unidentified copper alloy. Three of them [Fig. 4: 3–5] are nearly identical in size and made of round wire of identical radius of ca. 3.5 mm. This similarity in both stylistic and technological terms indicates they were most likely made by the same craftsman. The fourth of the booches [Fig. 4: 6] is a standout in technological terms. Its hoop is made of flattened wire and decorated with slanting notches. Brooches of this type are found in large numbers all over the territories of the Prussians and especially Yotvingians. They seem less

[1] Engel 2012, pp. 46–55.

Szurpiły, Jeleniewo municipality
site 4, ‘Targowisko’
results of detailed surface surveys
1982

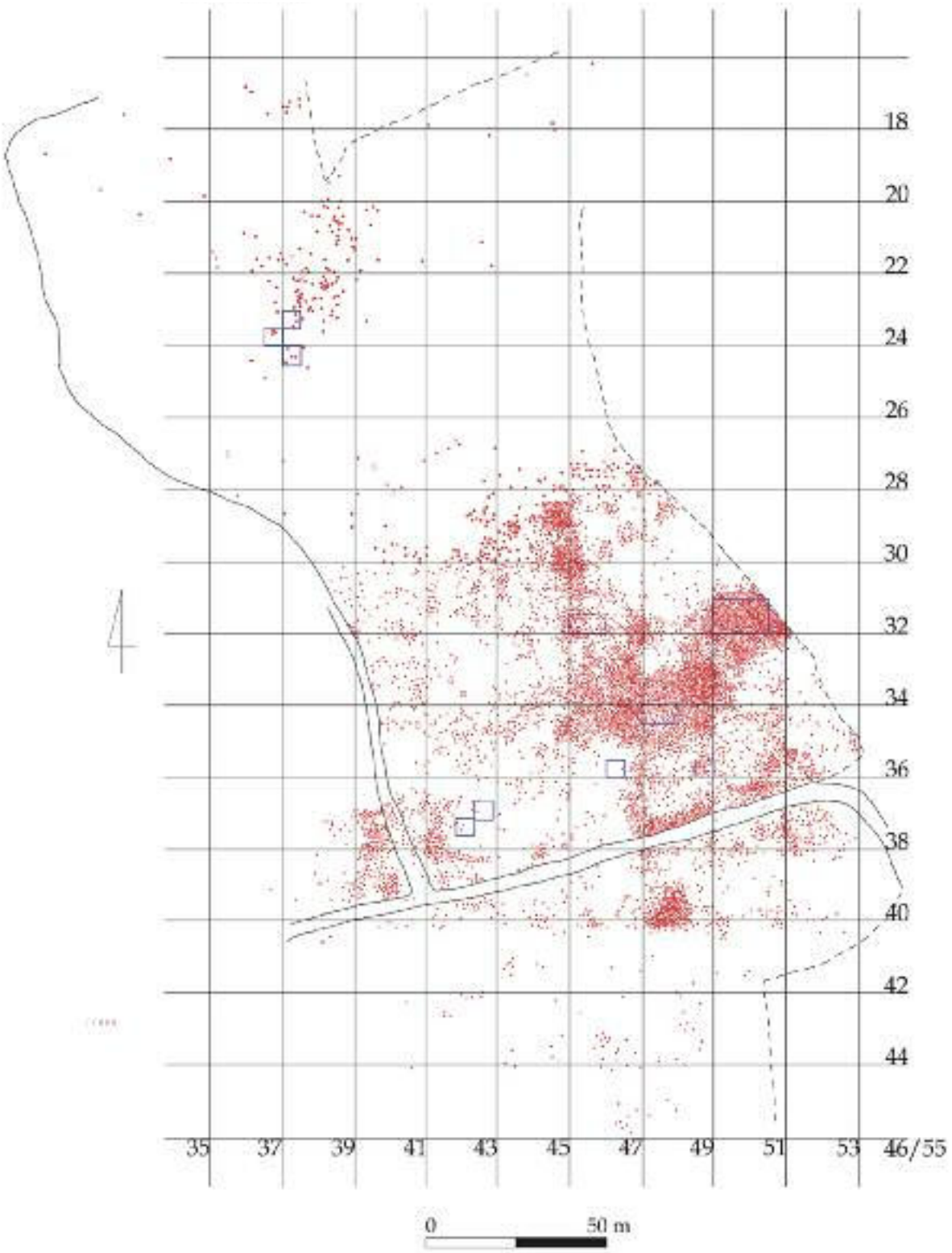

Fig. 2. Map of 1982 with exploratory excavations marked (according to L. Jończyk)

popular in Lithuania and Latvia. They are often seen as a primitive version of brooches with zoomorphic endings. Analogies in the immediate vicinity of the Szurpiły complex include a fibula of Żywa Woda dated to the eleventh–thirteenth centuries.[2] A similar chronology is agreed for brooches of Jegliniec.[3] There are also analogies from the region of Sambia, found by Vladimir Kulakov, also dated mostly to the tenth–thirteenth centuries.[4] The Szurpiły brooches are closest to the examples of Jegliniec and Żywa Woda, arguing for the dating for the eleventh–thirteenth centuries.

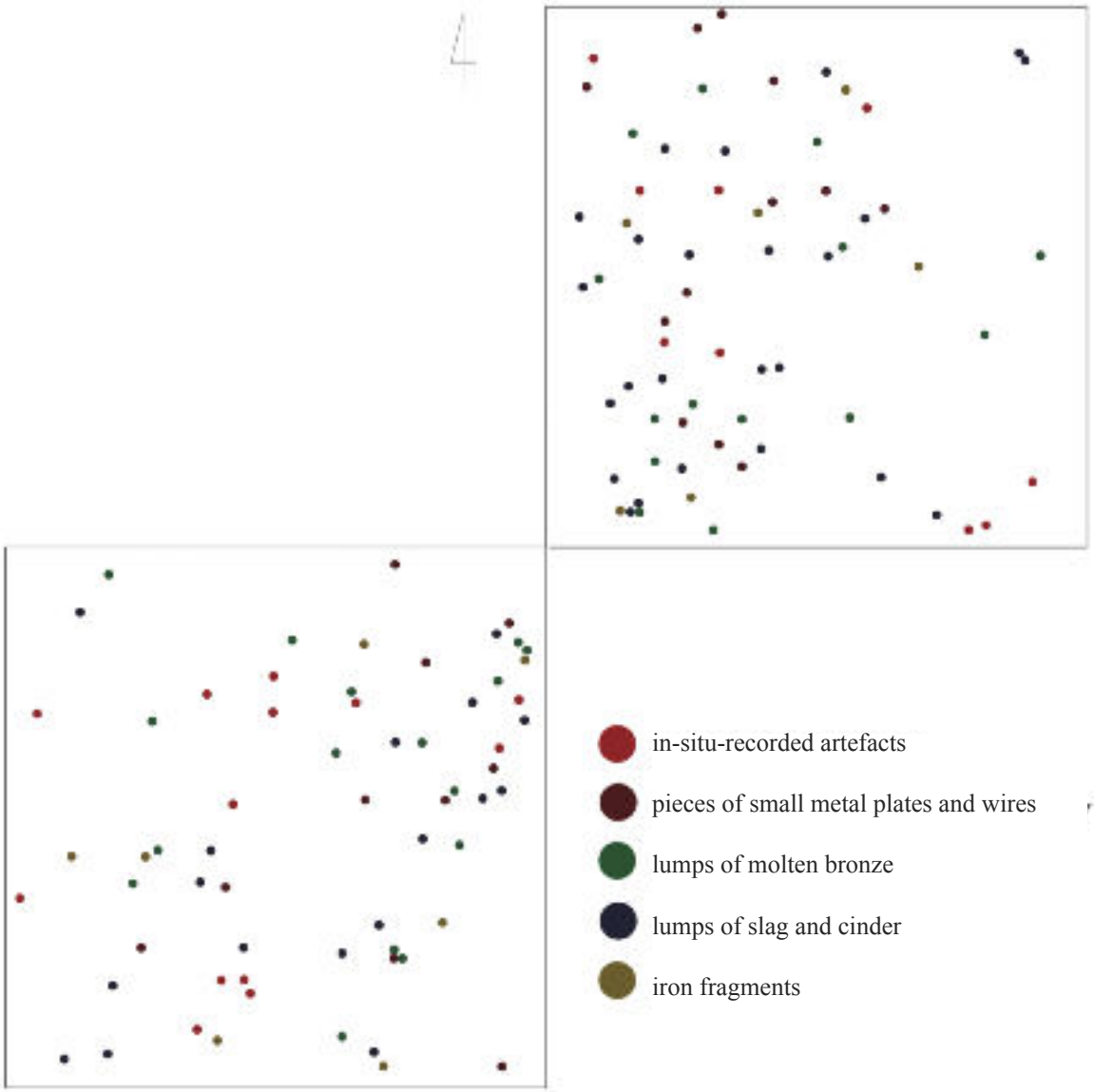

Fig. 3. Map of trench of 2006 on ares 38-42 and 37-43 (according to L. Jończyk)

[2] Kaczyński 1958, p. 153.
[3] Korczak 2005, p. 18.
[4] Kulakov 1990, pp. 72–82.

Another interesting group of finds consists of three rings. Two of them have open circuit with a broadened middle section decorated with a punches. Both bear signs of later modifications. The first [Fig. 4: 7] was broken, but was repaired by repeat coiling, which reduced its perimeter. The second [Fig. 4: 8] shows signs of repeated bending and straightening, which may point to an attempt to break it into pieces. This type of finds is characteristic for the territory of Rus and the eastern Baltic, as well as Mazowsze and southern Poland.[5] A numerous series of such finds is also found at the cemetery of Birka.[6] The rings of this type start to show up at the turn of the ninth and tenth centuries with the youngest examples from the turn of the twelfth and thirteenth centuries. The third of the rings [Fig. 4: 9] shows no signs of modification. In common with the examples discussed above it has an open circuit; in contrast to them, however, it is made of three interwoven wires. The clearest analogies are found at Izborsk and are dated to the eleventh–thirteenth centuries.[7] Rings of a similar kind are found at the cemeteries of Mazowsze and Podlasie, though their endings are usually loopy.[8]

Also from the trench come two fragments of spirally twisted wires, presumably pieces of cut necklaces [Fig. 4: 10 & 11]. The thickness of one wire [Fig. 4: 10] corresponds to the thickness of the loops of the brooches found in the same trench [Fig. 4: 3–5]. This may point to reuse of this type of cuttings in ornament production. A fragment of a crushed ending with wire imprints on the inside may be interpreted as an element of a necklace [Fig. 4: 12]. It probably comes from a necklace of the 'Totenkrone' type. Such finds are characteristic of the Bartia, Sambia and Natangia and are frequent in the Szurpiły settlement complex, especially at sites 4 ('Targowisko') and 8 ('Mosiężysko').[9] They are dated mostly to the thirteenth and fourteenth centuries.[10]

Fittings are the next category of finds with numerous representation in the material under discussion. These include three plate fragments with rivets [Fig. 4: 13–15], as well as a small ending of a knife scabbard with pointy ornament [Fig. 4: 16]. Similar objects are common nearly all over the Baltic. The Szurpiły fitting does not, however, have exact analogies anywhere in the comparative material. Its dating may thus only be set in the broad terms of the tenth–thirteenth centuries.[11] The most interesting find by far in this group is a buckle made of a damaged fitting [Fig. 4: 17]. This can be inferred from the trace of breakage at one end and an exceptionally small frame opening of the buckle. Two upper holes were made in the course of casting the object, while the others were made later in order to fix a wire barb and rivets. Such distribution suggests the buckle was made most likely of a damaged fitting of a belt ending. Along the edge is visible ornament in the shape of short notches, while decoration in the form of points was punched around the triangular hole.

A relatively numerous category of finds from the trench under discussion consists of bracelets. Three objects may be included here. The first is a small fragment of a semi-circular ingot decorated with punched points [Fig. 4: 18]. It is, however, very small and not very characteristic, making detailed chronological-stylistic analysis difficult. The second of the bracelets is a plated item made of metal tape with stamped knobs and a rectangular concave [Fig. 4: 19]. Analogous ornamentation is known from Kernavė, Lithuania, where a plated bracelet was found, decorated with a stamped ribbed pattern and pointy ornament, which is dated to the thirteenth century.[12] Bracelets of similar ornamentation of the eleventh–thirteenth century come from Izborsk.[13] The Szurpiły bracelets should be placed in a similar chronological framework. The last of the finds is a zoomorphic bracelet with a strongly upturned ending [Fig. 4: 20]. This finds analogies at Żytkiejmy and Rostka Konikowa[14] and is dated to the tenth–eleventh centuries.

[5] Kóčka-Krenz 1993, pp. 118–120; Sedov 2007, pp. 389–392; Zariņa 2006, pp. 284–286.
[6] Arbman 1940, pl. 111.
[7] Sedov 2007, p. 391, pl. 385: 8, 13, 14, 15.
[8] Jaskanis 2008, pp. 220–227.
[9] Sawicka 2011, pp. 263–268.
[10] Bogucki 2001, pp. 35–40.
[11] Engel 2000, pp. 42–47.
[12] Bitner-Wróblewska (ed.) 2002, p. 199, cat. no. 537.
[13] Sedov 2007, p. 382.
[14] Engel 2002, p. 328.

Three further finds require discussion. The first is a tin bell [Fig. 4: 21], very similar to bells found at the cemetery of Równina Dolna among others, dated to the thirteenth–fourteenth centuries.[15] The next is a massive tripartite bead of copper alloy with no clear analogies in the collected comparative material [Fig. 4: 22]. The last of the finds is a round tin appliqué with two bolts [Fig. 4: 23]. On the inside, where the bolts are, there is a very worn ornament. Its placement suggests the object was made of reused plate.

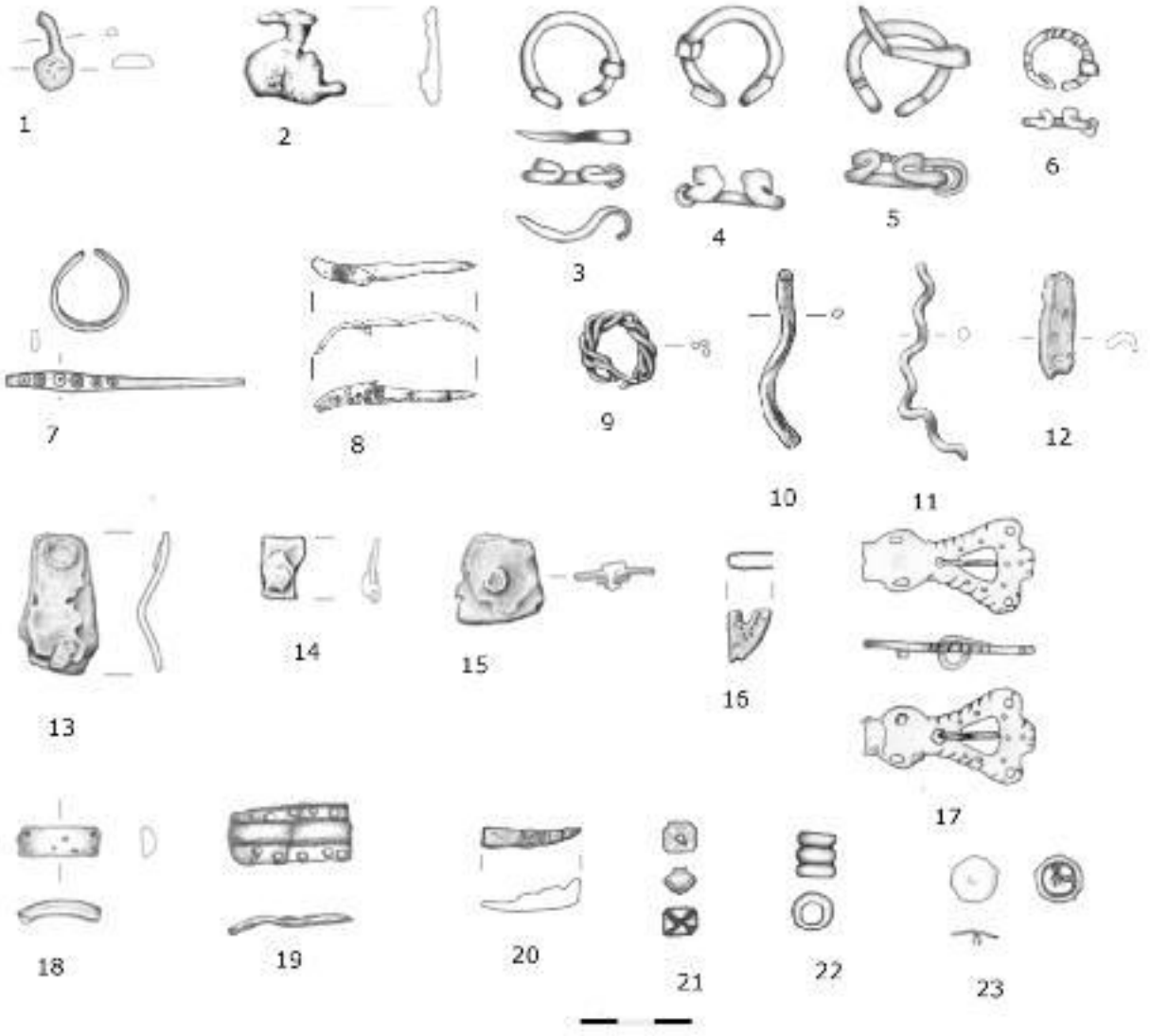

Fig. 4. Examples of copper alloy finds from the trench of 2006 on ares 38–42 and 37–43 (drawing L. Jończyk): 1. inv. 531/06; 2. inv. 41/06; 3. inv. 12/06; 4. inv. 556/06; 5. inv. 62/06; 6. inv. 29/06; 7. inv. 225/06; 8. inv. 13/06; 9. inv. 432/06; 10. inv. 764/06; 11. inv. 520/06; 12. inv. 259/06; 13. inv. 103/06; 14. inv. 173/06; 15. inv. 335/06; 16. inv. 119/06; 17. inv. 235/06; 18. inv. 522/06; 19. inv. 770/06; 20. inv. 219/06; 21. inv. 226/06; 22. inv. 14/06; 23. inv. 352/06

[15] Odoj 1958, pl. XX: 5, 6.

Finds of objects made of non-ferrous metals also occur in other trenches and are particularly numerous in materials found during surface prospecting with metal detectors. Not all, however, can be directly linked to local metalworking. As seen from trench 8 (‘Mosiężysko’), at Szurpiły these objects also played an important role in the burial traditions of the early medieval Yotvingians, as confirmed by the massive collection of lumps of melted metal, damaged ornaments and fragments of cut necklaces discovered at the site.[16] A proportion of the finds from ‘Targowisko’ is also likely to be linked to various manifestations of ritual and preparations to burial. Some of the finds, however, clearly point to local manufacturing. The most numerous of these are waste and intermediate products of copper alloy forging. This includes a fragment of an ingot forged on a grooving stake [Fig. 5: 1] or a rod square in cross-section [Fig. 5: 2], which was burnt presumably

Fig. 5. Waste and intermediate products of non-ferrous metalworking found over 1981–2010 (photo K. Żołędziowski): 1. inv. 189/05P; 2. inv. 3/82P; 3. inv. 637/10P; 4. inv. 382/06; 5. inv. 547/10P; 6. inv. 752/05P

[16] Sawicka 2011, pp. 263–268.

in the process of annealing before another stage of forging. The group of intermediate products, on the other hand, presumably includes a four-armed plate fragment ornamented with imprinted points [Fig. 5: 3], most likely an unfinished bell. Another example of this category is a barb of a hinged buckle [Fig. 5: 4]. Absence of any trace of hammering at the rivet indicates that it was prepared for later use. Surface surveys have also rendered tools, which may be linked to the aforementioned manufacturing activities. This includes tanged punches [Fig. 6: 1–3], which may be interpreted as tools for imprinting lines and circles on the metal,[17] and a massive punch [Fig. 6: 3] as well as a small anvil [Fig. 6: 4] with a butt for fixing in the stump.[18]

Waste products of casting are decidedly less numerous. Only a strongly corroded fragment of a cut-off entry channel of a cast [Fig. 5: 5] and a spoilt cast of a penannular brooch with zoomorphic endings [Fig. 5: 6] may be included here.

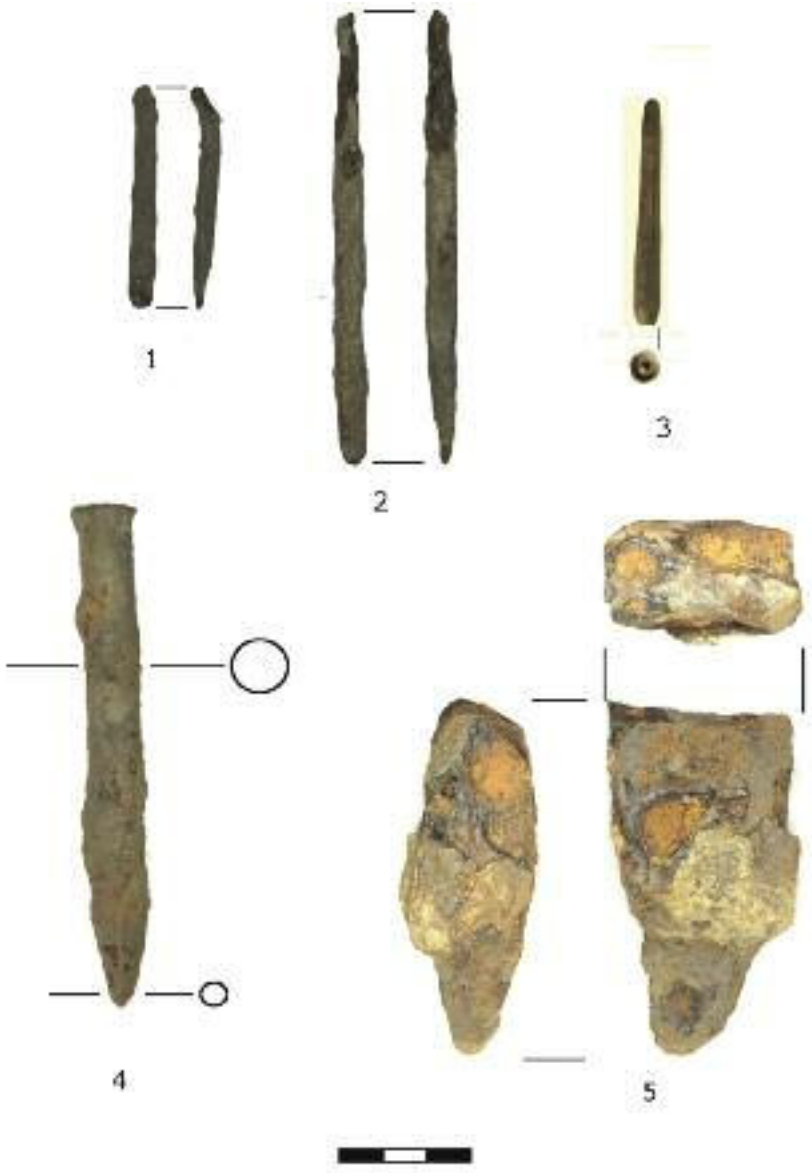

Fig. 6. Tools from surface survey of 2010 (photo K. Żołędziowski): 1. inv. 727/10P; 2. inv. 646/10P; 3. inv. 796/10P; 4. inv. 797/10P

[17] Coatsworth, Pinder 2002, pp. 46–50.
[18] Ohlhaver 1939, pp. 32–40.

Despite abundant evidence of local bronze working several important elements necessary for such a workshop are still missing. First of all, the casting furnaces are yet to be identified. As archaeological finds and experiments carried out in this field demonstrate,[19] a small pit lined with highly tempered clay [Fig. 7] or, in its absence, with stones is enough to melt copper alloys. Such objects are extremely perishable, especially in case of deep, intensive tillage, which is present at the 'Targowisko' settlement. Moreover in order for forging, which requires temperatures in the range of 600–700 degrees Celsius, a normal household hearth is quite sufficient.

Fig. 7. Reconstruction of casting furnace by paper author (photo N. Podgórska)

Also missing are ingots of the raw material. Finds from site 4 indicate, however, that the most frequent source of the raw material was scrap metal. We can interpret packages of scrap metal attached with rivets as a kind of packages of the metal were prepared for repeat smelting [Fig. 8: 1 & 2]. It also seems likely that rods collected from necklaces were reused [Fig. 4: 10 & 11], as indicated by the finds from the trench in the ares 38-42 and 37-43. Such rod fragments were found in this trench alongside buckles made of the same material. It also seems interesting that among the 'Totenkrone' necklaces found across Prussia some seem to lack an ending, which would indicate that parts were cut off.[20] Perhaps we are dealing with a phenomenon similar to that found in the case of silver ornament cuttings,[21] with the metal cut in this way serving as a means of exchange. Verifying this theory requires, however, further research.

[19] Lønborg 1998, p. 28.
[20] Odoj 1958, pls. XXI, XXII; http://www.smb-digital.de-/eMuseumPlus.
[21] Hårdh 1976, pp. 83–139.

The last of the missing elements is ceramics used in casting, that is crucibles. The issues of their production is exhaustively treated in Theophilus Presbyter's work of medieval crafts. He mentions that old crucibles were used in the production of new ones, ground to powder and mixed with raw clay.[22] This type of procedure means that a large part of the ceramics was reused and only a small part had any chance of survival. Taking into account the small proportion of casting in ornament production at 'Targowisko' absence of this type of finds may be blamed on the state of the site's preservation and the extent of excavations.

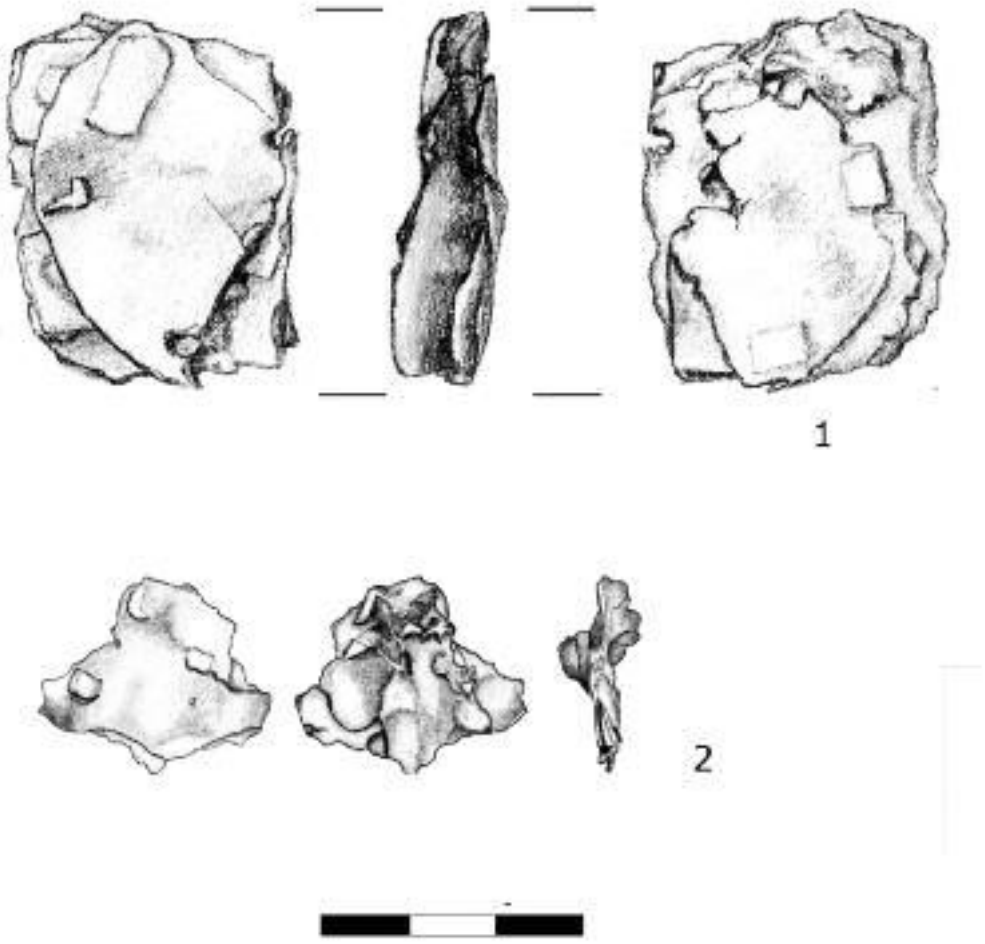

Fig. 8. Packets of plated waste prepared for recycling (drawing L. Jończyk):
1. inv. 213/05P; 2. inv. 1158/07

In beginning the summary of the paper, I wish to stress that it is not a comprehensive treatment of the site, but a brief outline of the issues associated with the identification of Yotvingian bronze--working workshops in archaeological material. A full and credible interpretation will be possible only after the completion of processing of the finds and mapping data. Nevertheless some conclusions may already be reached.

[22] Theophilus Presbyter, *Schedula diversarum artium*, 22 & 65.

Some of the finds confirm local bronze production, but no remains of hearths connected to this activity have been found. This may be explained by the significant deterioration of the site due to deep tillage and to the fact that such objects were often made of poorly baked clay. The most intensive production presumably took place in the ares 38-42 and 37-43, as confirmed by the finds from that area. Metalworking may also have taken place in other parts of the settlement. We also cannot rule out that the activity was seasonal and temporary hearths were placed haphazardly in different parts of the settlement, depending on needs of the time. Finds from the nearby cemetery of 'Mosiężysko' show that non-ferrous metals were also important in the spiritual life of the Yotvingians and some of the numerous faulty objects found at the 'Targowisko' may be connected to little known rituals.

The most numerous category of finds includes objects such as brooches or fittings. Numerous in this category are penannular brooches with bent endings, which display close stylistic parallels and similar radius of the wire, indicating presumably that they were made by the same hand. Ornaments such as necklaces, rhomboid pendants, bells, rings made of wire and tape and forged or plated bracelets were presumably also made in the local workshop. Numerous traces of repairs and modifications indicate the workshop also undertook work of that type.

The basic material for ornament production was copper alloys, although there is also a small number of objects of lead and tin and individual finds of silver and gold. The raw materials were presumably largely recycled from scrap metal. The site does not include pure metal, for example in the form of ingots, but packages of scrapped plate and smelted necklace fragments, which may also have been used for recycling. The planned chemical analysis of the finds may bring very interesting results in this matter.

The dominant technique of ornament manufacturing was forging and plastic deformation. Most objects were made of round wire and plates of varying thickness. Some items were also made of tape forged on specially profiled anvils, so-called grooving stakes. Tools found during surface surveys of 2010 may also be linked to forging. Scarcity of casting refuse shows that this was a less popular technique. It was presumably used mostly to supply intermediate products for further cold processing. The few cast elements, such as necklace endings display thickness and imprecise finishing, indicative of a low level of technological sophistication of the workshop. The products of Szurpiły craftsmen were presumably destined mostly for the local market.

On the basis of comparative material collected to date, we may presume that the workshop was functional in the latter stages of the early Middle Ages, that is between the eleventh and thirteenth centuries. The issue requires, however, further research.

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Streszczenie

Czy na osadzie „Targowisko" (st. 4) w Szurpiłach (gm. Jeleniewo) działała pracownia brązownicza?

Szurpiły położone są ok. 15 km na północ od Suwałk. Osada „Targowisko" (st. 4) jest największą osadą kompleksu osadniczego, którego centralne miejsce stanowi grodzisko na Górze Zamkowej.

W 1980 r. do Szurpił zawitała ekspedycja archeologiczna pod kierownictwem profesora Jerzego Okulicza-Kozaryna. Pierwsze wykopy na „Targowisku" otworzono w roku 1981. Wiosną 1982 r. na terenie „Targowiska" przeprowadzono badania powierzchniowe połączone z planigrafią. Pozwoliły one na ustalenie zasięgu stanowiska. Wykopaliska trwały ciągle do 1990 r. Kolejne badania „Targowiska" realizowane były przez DAB PMA oraz IA UW w ramach „Projektu Szurpiły" w latach 2005–2010. W sezonach tych wykonano szereg prospekcji z użyciem wykrywaczy metali, pomiary geofizyczne, odwierty geologiczne oraz otworzono kolejne wykopy.

Podczas prowadzonych badań powierzchniowych na terenie niemal całego stanowiska znajdowane były liczne, często silnie rozdrobnione przedmioty wykonane ze stopów miedzi. Niektóre

z nich można zaliczyć do grupy odpadów lub półproduktów. Podczas badań wykopaliskowych w sezonie 2006 w jednym z wykopów [Fig. 3] udało się natrafić na znaczna koncentrację tego typu zabytków [Fig. 4]. Nie udało się jednak jednoznacznie zlokalizować pracowni, a co za tym idzie paleniska, które stanowiło zapewne jej serce. Wiązać można to ze znacznym stopniem zniszczenia osady przez głęboką orkę oraz faktem, że paleniska często wykonywane były ze słabo wypalonej, silnie schudzonej gliny.

Najliczniejszą kategorię wyrobów stanowią przedmioty takie jak zapinki czy okucia. Licznie reprezentowane są zapinki podkowiaste z odgiętymi końcami, silnie powiązane ze sobą stylistycznie i wykonane z podobnej średnicy drutu, co wskazuje, że wyszły prawdopodobnie spod tej samej ręki [Fig. 5]. Ozdoby takie jak naszyjniki, zawieszki romboidalne, dzwoneczki, pierścienie z drutu i taśmy oraz bransolety kute i blaszane zapewne również wykonywane były w miejscowej pracowni. Liczne ślady napraw i przeróbek na odnalezionych przedmiotach wskazują, że warsztat oprócz produkcji zajmował się również dokonywaniem napraw gotowych wyrobów, często pochodzących również z importu.

Podstawowym materiałem do produkcji ozdób były stopy miedzi, chociaż występuje również niewielka liczba przedmiotów ołowiano-cynowych oraz pojedyncze zabytki ze srebra i złota. Pozyskiwano go zapewne w dużej mierze ze złomu. Na stanowisku nie znaleziono czystego surowca, np. w postaci sztabek. Licznie występują natomiast paczki blaszanych odpadów oraz nadtopione fragmenty naszyjników [Fig. 6], które częściowo mogły być wykorzystywane jako materiał w lokalnej produkcji. Nie można jednak bezkrytycznie wiązać wszystkich tego rodzaju przedmiotów z działalnością lokalnego brązownika. Jak pokazują znaleziska z położonego w obrębie szurpilskiego kompleksu cmentarzyska warstwowego „Mosiężysko" (st. 8), cięte lub niszczone w inny sposób przedmioty ze stopów miedzi odgrywały zapewne również znaczą rolę w obrzędowości mieszkańców wczesnośredniowiecznej Jaćwieży.

Dominującą techniką wykonywania ozdób było kucie i obróbka metaloplastyczna. Odlewnictwo pełniło raczej funkcję pomocniczą. Prawdopodobnie działalność brązownicza miała charakter sezonowy i mogła odbywać się w kilku miejscach na terenie osady. Produkcja nastawiona była głównie na zaspokojenie potrzeb lokalnej społeczności, zaopatrując ją w przedmioty takie jak: zapinki podkowiaste, pierścienie, bransolety, naszyjniki i zawieszki. Ze wstępnych ustaleń wynika, że czas funkcjonowania warsztatu lub warsztatów przypadał na okres między XI a XIII w. n.e.

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