Historia Slavorum Occidentis
2019, nr 2 (21)
ISSN 2084-1213
DOI: 10.15804/hso190206

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Sharpening stones, beads, spindle whorls and other stone artefacts from an early-medieval stronghold in Grzybowo[1]

Słowa kluczowe: Grzybowo, gród, zabytki kamienne, bursztyn, karneol

Keywords: Grzybowo, stronghold, stone historical objects, amber, carnelian

Abstract: The article discusses the issue of stoneware in the time of the Grzybowo stronghold's operations. Special emphasis has been placed on imports and contacts between the stronghold's communities and various distant areas, ruled by the Piast dynasty and others.

Introduction

The structure in Grzybowo is among the most important early-history strongholds in Wielkopolska. The first artefacts were extracted there in the 19th century; more attention was devoted to the Grzybowo stronghold in the early decades of the 20th cen-

[1] The work is financed as part of project no. UMO-2017/25/B/HS3/00016 of the National Science Centre, Poland. The presented article is an English, abridged version of a text written for a monograph of the stronghold in Grzybowo. In the work, the authors focus on presenting fundamental data on the stone objects used in the strongholds and the raw materials used in the production process. It is an attempt at identifying its origin. An in-depth analysis of the issue is included in the above mentioned monograph of the archaeological site's monograph in creation.

tury[2]. In the 1870s, Wilhelm Schwarz obtained cultural material from the stronghold in mysterious circumstances and attributed it to the early Middle Ages[3]. Before WWII, the stronghold raised also interest of Polish scholars, archaeologists and geographers[4]. In archaeological research into the stronghold, of greatest importance was the work of Olgierd Brzeski who found there ceramic material and animal bones; in 1938 he published it[5]. O. Brzeski was a key person in the research into the stronghold in Grzybowo; he initiated archaeological excavations which continued for several seasons[6].

In general, the Grzybowo *castrum* slipped into oblivion after WWII[7]. It was not included into the so-called millennium research aimed at exploring numerous early-Piast strongholds (Giecz, Gniezno, Kruszwica, Poznań, Santok and others). Even if the Grzybowo stronghold stood out with respect to its size, lack of coverage in written sources accompanied by non-existent visible remains of masonry architecture discouraged scholars from including the structure into the celebration of a thousand years of the Polish state and the related field works. The situation did not change until 1988 when systematic excavations started in Grzybowo, initiated by the aforementioned O. Brzeski and the Brzeski Foundation, affiliated with the Archaeological Committee of the Poznań Society for the Advancement of Arts and Sciences. The excavations were carried out in the stronghold and, to a lesser degree, the closest settlement. The works were continued (with interruptions) until 2009[8].

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[2] *Słownik geograficzny Królestwa Polskiego i krajów słowiańskich*, eds. B. Chlebowski, F. Sulimierski, W. Walewski, vol. 2, Warszawa 1881, p. 895 – information about finding a stone axe inside the "pit" – inside the stronghold's embankment: P. Schumacher, *Die Ringwälle in der früheren preussischen Provinz Posen. Ein Beitrag zur vorgeschichtlichen Kartographie*, Leipzig 1924, p. 28. The latter work includes a list of older (also 19th century) bibliographical positions on the Grzybowo stronghold.

[3] W. Schwartz, *I. Nachtrag zu den Materialien zur prahistorischen Kartographie der Prov. Posne. Beilage zum Programm des Kenigl. Fr. W. Gymnasium in Posen*, Poznań 1879, p. 7.

[4] J. Dylik, *Analiza geograficznego położenia grodzisk i uwagi o osadnictwie wczesnohistorycznym Wielkopolski*, Poznań 1936, p. 82; W. Kowalenko, *Grody i osadnictwo grodowe Wielkopolski wczesnohistorycznej*, Poznań 1938, p. 218, figure 1.

[5] O. Brzeski, *Grodzisko wczesnośredniowieczne w Grzybowie w powiecie wrzesińskim*, Z Otchłani Wieków 13 (1936–1938), pp. 151–153.

[6] D. Dominiczak-Głowacka, *Olgierd Brzeski – od pasji archeologią po zwieńczenie marzeń*, Studia Lednickie 10 (2010), pp. 169–173.

[7] This issue is well illustrated in the following text: W. Hensel, *Studia i materiały do osadnictwa Wielkopolski wczesnohistorycznej*, vol. 2, Poznań 1953, pp. 160–162 which the presented state of knowledge of the structure was still very modest.

[8] Information about the history of research into the Grzybowo stronghold is available in:

The research carried out to date allowed to identify the chronological framework of the stronghold. Its origin has been dated back to the 920s; it most probably operated by the mid-11th century. Perhaps its fall was brought about in the second quarter of that century[9]. Research suggests also that in the 10th century, the structure was the biggest single establishment in the then Wielkopolska[10]. Therefore, questions arise about the importance and the position of the stronghold in its contemporary stronghold structure in the Piast dominion. In order to provide the answers, attention needs to be paid to smaller issues including artefacts made of various types of stone used in the stronghold.

The historical material under discussion comes from site no. 1 (the stronghold). It was obtained in the course of excavations carried out in 1989–2007[11]. The collection of artefacts is diverse with respect to the raw material and function; it comprises one hundred and sixty one items. Following a preliminary analysis, they were divided into two groups. The first one included items used in everyday life while the other group consists of beads used for decorative purposes. Within the everyday artefacts, several functional and formal categories were identified, the biggest consisting of sharpening stones (forty specimens), accompanied by seventeen grinders, five spindle whorls, four grindstones, four stone balls, a door hinge and forty eight artefacts whose functions have not been identified but which definitely bear traces of processing. What is more, the collection includes a piece of ochre[12] which has also been listed in the raw material and quantity specifications. The decorations consisted of thirty nine beads. On

Z. Kurnatowska, M. Tuszyński, *Grzybowo pod Wrześnią. Wczesnopiastowski gród na szlaku z Giecza do Gniezna*, [in:] *Custodia Memoriae Muzeum Pierwszych Piastów na Lednicy. XL lat istnienia (1969–2009)*, ed. A.M. Wyrwa, Lednica 2009, pp. 141–143. A popular-science approach to the issue was presented by J. Wrzesiński, *Gród w Grzybowie. Historia i przyroda*, Grzybowo – Lednica 2014, p. 6.

9 O. Brzeski, Z. Kurnatowska, M. Tuszyński, *Dziesięciolecie badań wykopaliskowych grodziska w Grzybowie, gm. Września, byłe woj. poznańskie*, Wielkopolskie Sprawozdania Archeologiczne 5 (2000), p. 65; Z. Kurnatowska, *Grzybowo pod Wrześnią – potężny gród wczesnopiastowski*, Landform Analysis 16 (2011), p. 57; I. Petri, *Die Burganlage Grzybowo-Rabieżyce vor dem Hintergrund der piastischen Staatsbildung*, Starigard. Jahresbericht des Fördervereins des Instituts für Ur – und Frühgeschichte der Christian-Albrechts-Universität Kiel 8 (2007), pp. 10–11; J. Wrzesiński, M. Danielewski, *Zaplecze osadnicze grodu w Grzybowie*, Historia Slavorum Occidentis 17 (2018), no. 2, p. 87.

10 Ibidem, pp. 89–90.

11 The presented text disregards stone artefacts from the latest excavations (2018). This material, together with objects which may be explored in the subsequent research season (2019), will be presented in an article included in the stronghold's monograph.

12 Product of rock weathering used as dye.

top of that, a piece of rock crystal has been identified (perhaps used to make a bead) and a piece of amber. Beside the mentioned categories of objects made of stone, in the course of research into the stronghold's layers a piece and semi-products of axes were found together with flint tools, cores, production waste and chert chips[13].

A preliminary analysis of the raw materials is based on macroscopic examination which hampers the interpretation of some materials[14]. It is common knowledge that macroscopic examination of rocks is most effective when carried out on fresh deflections; in many cases, this type of analysis is impossible. Not every item can be chipped while external processing coupled with possible weathering make material interpretation harder[15].

Sharpening stones

Starting with the early Roman influence up to the late Middle Ages, sharpening stones were among the most frequently found stone artefacts. Typically, they are thought to have been used to sharpen metal tools (cutting and piercing) and to clean the surfaces of objects made of non-ferrous metal, bone, horn, wood and to clean human wounds and skin. They were also used in other activities including tannery[16]. Some, especially the ones made of phyllite, in special circumstances could have served as touchstones[17].

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[13] Stone axes and tools in the early-medieval layers of the stronghold were brought there and as such are not subjects of this article.

[14] Microscopic examination of the stone artefacts from the Grzybowo stronghold is planned as a subsequent stage of the research; the results will be presented in a separate academic work.

[15] J. Skoczylas, *Użytkowanie surowców skalnych we wczesnym średniowieczu w północno-zachodniej Polsce*, Poznań 1990, p. 29.

[16] J. Kaźmierczyk, *Kamień w kulturze wczesnośredniowiecznego Ostrowa Tumskiego we Wrocławiu w wiekach X-XIII*, Wrocław – Warszawa 1990, pp. 123–124; E. Lisowska, *Średniowieczne i nowożytne wyroby z kamienia odkryte podczas badań przy ulicy Katedralnej 4 we Wrocławiu*, [in:] *Ze studiów nad życiem codziennym w średniowiecznym mieście. Nowożytny cmentarz przy kościele św. Piotra i Pawła na Ostrowie Tumskim we Wrocławiu (lata 1621–1670)*, ed. A. Pankiewicz, Wrocław 2012, pp. 229–230. E. Lisowska, *Wydobycie i dystrybucja surowców kamiennych we wczesnym średniowieczu na Dolnym Śląsku*, Wrocław 2013, p. 108.

[17] A. Wrzesińska, J. Wrzesiński, *Kto się nie leni, zrobi złoto z kamieni – Sharpening stones w grobach wczesnego średniowiecza*, Acta Archaelogica Lodziensia 60 (2014), pp. 216–217. Cf. M. Ježek, J. Zavřel, *Prubířské kameny mezi archeologickými nálezy*, Archeologické Rozhledy 62 (2010), no. 4, pp. 608–628.

The collection of sharpening stones includes forty pieces, most of which have survived in fragments. There are three objects in the collection whose interpretation is uncertain due to their poor state. Among the excavated sharpening stones, twenty three are made of phyllite. They are small, carefully processed specimens; only two of them have survived in one piece. They are from 8.0 cm to 8.85 cm long and from 1.0 to 1.4 cm broad. On the other hand, the fragments have the following dimensions: from 0.9 cm to 8.8 cm long and from 0.25 cm to 3.8 cm wide. In nine items, the holes have survived with a diameter oscillating between 0.2 cm and 0.5 cm. This type of historic items is considered unique and associated with the culture of the early-medieval elites[18]: inhabitants of strongholds and trade and craft settlements. The raw material was a part of a well-developed long-distance trade based mainly on water routes connecting the southern coast of the Baltic Sea and the basin of the central Danube. The carefully manufactured items were produced between the 7th/8th and the 12th/ 13th centuries in the Baltic zone, known in the Scandinavian as well as the Slavic part of the area[19]. Production of phyllite sharpening stones decreased in the 12th c. when other types of rocks: gneiss, mudstone, quartz sandstone were used in the production process [20]. In Lower Silesia (the potential area of the material's exploration), sharpening stones made of phyllite were popular chiefly in the late 9th and the early 10th centuries until the 12th century[21].

Among the remaining seventeen sharpening stones, only three have survived intact. Fifteen of the sharpening stones were made of sandstone, one of (probably) gneiss and the other one of diabase. The sharpening stones made of materials other than phyllite were bigger and less shapely; two of them have holes (inventory no. MPP/GRZ/2040, MPP/GRZ/175). What is more, the sharpening stone numbered MPP/GRZ/2040 bears traces of cutting on the corners. Both the aperture and the cuts could have been used for hanging. An interesting case in this group is a sharpening stone made of quartz sandstone (inventory no. MPP/GRZ/430), preserved in two pieces. It has the shape of a small prism, 5.2 cm long and 1.3 cm broad. One of the bases (the smaller area) bears traces of two crossing cuts. Perhaps

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18 M. Kara, *W kwestii pochodzenia wczesnośredniowiecznych osełek z fyllitu odkrytych na ziemiach Polski północno-zachodniej – głos w dyskusji*, [in:] *Świat Słowian wczesnego średniowiecza*, ed. M. Dworaczyk, A. B. Kowalska, S. Moździoch, M. Rębkowski, Szczecin–Wrocław 2006, p. 395.

19 Ibidem, pp. 395–396.

20 J. Skoczylas, *Użytkowanie surowców skalnych*, pp. 115–116.

21 E. Lisowska, *Wydobycie i dystrybucja*, p. 242.

it was made to be used as a stamp for decorating ceramics[22]. It is also possible that it was a tool for sharpening sewing objects or piercing.

The biggest number of sharpening stones comes from adjacent pits 12 and 14 (located in the south-western part of the stronghold) – six pieces in each pit (Table 1). Only five of the sharpening stones were found inside structures: two in object 26 (MPP/GRZ/454; MPP/GRZ/458); the aforementioned sharpening stone-cum-stamp comes from object 19; artefact 50 included historical object with inventory no. MPP/GRZ/1061; one sharpening stone from pit 1/06 (inventory no. MPP/GRZ/2113) was found in a furnace. In the case of four other sharpening stones, there was no data available about their specific location.

As for the types of rocks used to make sharpening stones, phyllite prevails. It was imported to the north-west of Poland[23]. There has been an on-going discussion in literature on the subject of its origin [24]. The discussion was triggered off by Janusz Skoczylas who stated that the sources should be attributed to Lower Silesia, probably in the vicinity of Głuchołazy and Jarnołtówek (the Eastern Sudetes)[25]. J. Skoczy-

[22] It will be possible to verify this opinion in the course of an analysis of the ceramic material in progress. Decision about the object's function will be reflected in the mentioned monograph of the stronghold.

[23] Here we should emphasize that almost all the discussed objects made of stone and found in the Grzybowo stronghold were imported. This is justified because erratic stone was the only material largely available in Wielkopolska. Therefore, we can assume that a majority of stone objects or the materials used to produce them were imported from outside the area in question..

[24] I. Gabriel, *Hof – und Sakralkultur sowie Gebrauchs – und Handelsgut im Spiegiel der Kleinfunde von Starigard/Oldenburg*, [in:] *Oldenburg-Wolin-Staraja Ladoga-Novgorod-Kiev. Handel ind Hnadelsverbindungen im südlichen und östlichen Ostseeraum während des frühen Mittelalters*, ed. M. Müller-Wille, Mainz 1988, pp. 209, 248–249; J. Skoczylas, *Użytkownie surowców skalnych*, pp. 51–53; E. M. Foltyn, L. Jochemczyk, *Wykorzystanie surowców skalnych do produkcji osełek w starszej fazie wczesnego średniowiecza na Górnym Śląsku*, [in:] *Użytkowanie surowców skalnych w początkach państwa polskiego*, ed. J. Skoczylas, Poznań 1994, p. 58; J. Skoczylas, *Użytkowanie surowców skalnych w początkach państwa polskiego w Wielkopolsce*, [in:] *Użytkowanie surowców skalnych w początkach państwa polskiego*, ed. J. Skoczylas, Poznań 1994, p. 71. W. Łosiński, *Rola kontaktów ze Skandynawią w dziejach gospodarczych Słowian nadbałtyckich*, Przegląd Archeologiczny 45 (1997), p. 76; W. Duczko, *Obecność skandynawska na Pomorzu i słowiańska w Skandynawii we wczesnym średniowieczu*, [in:] *Salsa Cholbergiensis. Kołobrzeg w średniowieczu*, ed. L. Leciejewicz, M. Rębkowski, Kołobrzeg 2000, p. 27; M. Kara, *W kwestii pochodzenia*, pp. 395–404; M. Szydłowski, *Wstępna analiza kamiennych osełek z wczesnośredniowiecznego Wolina*, [in:] *Wolińskie Spotkania Mediewistyczne I. Ekskluzywne życie – dostojny pochówek. W kręgu kultury elitarnej wieków średnich*, ed. M. Rębkowski, Wolin 2011, pp. 45–51.

[25] J. Skoczylas, *Użytkowanie surowców skalnych*, pp. 51–53.

las' conclusion stemmed from (mainly macroscopic) analyses of the selected historic objects from the north-west of Poland. Phyllite was probably imported since the early 8th century while sharpening stones made from it were discovered in layers dated back to the first half of the 13th century[26]. Products made from this material are particularly numerous in the north-west of Poland and in Upper Silesia. However, according to Skoczylas, the material was extracted mainly in the vicinity of Głubczyce[27]. As Michał Kara has stated, this hypothesis can be accepted in the case of bigger historic objects, less processed, in the form of an ingot, dated back to the 8th-10th centuries. However, the case of carefully manufactured specimens, occurring in Upper Silesia and more popular in the north-west of Poland and Western Pomerania, raise doubts. In the case of this type of sharpening stones, they could be of Scandinavian origin (most probably the phyllite was from Norway). The specimens from Western Pomerania were used in the 8th – 12th/13th centuries and the ones from Wielkopolska in the 10th – 12th/13th centuries. Now historians are of an opinion that the discovered sharpening stones include items made from rocks from the Sudetes and Norway. The latter would be carefully crafted, shaped like an elongated prism and frequently had an aperture. The items in the amorphous-lump form without an aperture could have been made from material obtained in Silesia[28]. Among the Grzybowo specimens are sharpening stones made of phyllite which represent a morphotype suggesting their Scandinavian origin. However, their origin necessitates further research[29].

In the context of an analysis of material of alleged Scandinavian origin, of interest is the sharpening stone MPP/GRZ/2040 with an aperture whose form is reminiscent of some specimens from an early medieval site in Birka[30]. We must add, however, that this is only a formal analogy and it is impossible to use it as the basis for explaining the origin (imitation?) of the Grzybowo sharpening stones.

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26 Idem, *Użytkowanie surowców*, p. 71.

27 Idem, *Użytkowanie surowców skalnych*, pp. 51–53; podobnie E.M. Foltyn, L. Jochemczyk, *Wykorzystanie surowców skalnych*, pp. 58–59, figure 5.

28 M. Kara, *W kwestii pochodzenia*, p. 396; E. Lisowska, *Wydobycie i dystrybucja*, pp. 217–219.

29 It will be possible to identify more accurately the material used to make the sharpening stones following analyses, including petrographic analyses.

30 H. Arbman, *Birka. Die Gräber*, vol. I/1–2, taf. 188:3–5, Uppsala 1940–1943.

Grindstones

The Grzybowo collection also comprises four grindstones (MPP/GRZ/792; MPP/GRZ/875; MPP/GRZ/889; MPP/GRZ/1021). These objects are similar to the sharpening stones with respect to the morphometric features; besides, the function of both groups of historic objects could have been similar which sometimes makes their unambiguous classification problematic. By our standards, grindstones are historic objects with at least one working surface broader than the sharpening stones' with visible traces of grinding (polishing). Anna Kulczycka-Leciejewiczowa and her team have defined a grinding slab as "an object (...) prepared intentionally by means of proper processing of the working part or selected from all the natural specimens suitable for grinding or polishing hard objects (...) these slabs are objects with at least one oblong flat surface or (more frequently) concave, typically ground, with more or less distinct parallel scratches as evidence of work"[31]. In the case of the Grzybowo artefacts, a "stone" is a more suitable description than a "slab" because its surface is small. One specimen, intact, 13.7 cm long, 5.6 cm wide, 3.7 cm high (MPP/GRZ/1021 – from pit 17) has an irregular shape, a quadrilateral cross-section, all its surfaces are polished; one of them, more worked on, has a basin. The situation is similar in the case of another damaged grindstone (inventory no. MPP/GRZ/889 – no information about the location): one surface is basin-shaped. The two remaining historic objects are probably fragments of grindstones. One was discovered in pit 15 (MPP/GRZ/875); there is no information about the other one's location. In two cases, sandstone was used to make the grindstones in Grzybowo (MPP/GRZ/875; MPP/GRZ/1021), in another case it was granite (MPP/GRZ/792, possibly pegmatite) and amphibolite (MPP/GRZ/889).

Grinders

The second biggest collection of discovered stone objects includes tools identified as grinders. They are among the oldest and, at the same time, the simplest forms of stone tools. This stems from their function i.e. grinding various types of substances. A grinder is "any (...) object small enough to be held in hand, with a surface bear-

[31] A. Kulczycka-Leciejewiczowa, A. Majerowicz, A. Prinke, J. Skoczylas, W. Wojciechowski, *Opis zabytków kamiennych. Propozycja standaryzacji*, Warszawa 1996, p. 24.

ing in one or more places traces of work in the form of rubbing off. This category of tools includes both artefacts which were selected for the sole purpose of grinding (e.g. raw pebbles) or were made with this purpose in mind as well as items re-used for the purpose"[32]. The Grzybowo collection has seventeen specimen; however, four of them cannot be easily identified. Twelve objects in this collection are intact while five are preserved only in fragments. In the group of intact specimens, oval (and, less frequently, round) grinders prevail. The diameter of the round specimens (four pieces) ranges between 4.8 cm and 8.45 cm. The oval or oval-like grinders range from 6.8 cm to 11.7 cm in length and from 5.6 cm to 8.7 cm in width and from 2.5 cm to 5.6 cm in thickness. In the pits under survey, typically single specimens were found – in pits 2a, 6, 7, 10, 12, 14, 15, 25, 32, 49 single objects were found. Only pit 16 contained two pieces. Four were found inside structures (MPP/GRZ/220 – in the ceiling of structure 15; MPP/GRZ/419 – in the ceiling of structure 24, two in pit 16: MPP/GRZ/1074, MPP/GRZ/1076 – in structure 50). Information about the location of four grinders was missing. They were made from erratic materials like sandstone (11), granite (5) and, in one case, most probably diorite.

Spindle whorls

Spindle whorls, made of various materials, are among the biggest groups of historic objects in the stronghold under discussion. These objects, remains of spindles, are evidence that weaving was popular. During the research carried out by 2007, a hundred and seventy five pieces were found. Dorota Dominiczak-Głowacka has analysed the spindle whorls from the Grzybowo stronghold[33]; she analysed two specimens made from stone, two made of lead and one hundred and sixty made from clay. These proportions probably stem from easier access to the raw materials and better skills in processing clay[34]. She disregarded three spindle whorls made of stone (MPP/GRZ/312, MPP/GRZ/942, MPP/GRZ/1392). One of them was made from white limestone like another one published earlier[35]. As for the two re-

[32] Ibidem, p. 27.

[33] D. Dominiczak-Głowacka, *Przęśliki z wczesnośredniowiecznego grodziska w Grzybowie, w województwie wielkopolskim nieopodal Wrześni*, Studia Lednickie 9 (2008), pp. 243–269 – the analysis includes material obtained by 2004.

[34] Ibidem, pp. 244–245, 248–249, 256.

[35] Ibidem, pp. 251, 253.

maining fragments, the raw material is hard to identify. We should therefore state generally that they are stone spindle whorls[36]. One of them (MPP/GRZ/942) bears traces of black paint. Limestone spindle whorls were probably produced locally, they were excavated in many sites (hamlets, strongholds, grave fields), in Gniezno, Opole, Kałdus[37] and Ostrów Lednicki, to name a few[38]. When analysing the limestone spindle whorls from Ostrów Lednicki, Skoczylas indicated the source as the vicinity of Rożniatów (Czepów, Zaborów, Kraski, Świnice) and the region of Piechcin – Barcin – Wapienno where limestone outcrop is common[39]. They could have been a source of raw material for the population of the Grzybowo stronghold. It is also possible that they were obtained as a result of trade or exchange.

Among the two intact stone objects, one (MPP/GRZ/549) represents a type with sharp curves of the cones[40]. Its diameter amounts to 2.25 cm, height to 1.2 cm and the aperture's diameter is 0.9 cm. The other historic object (MPP/GRZ/1297) has soft curves of the cones with a diameter of 2.1 cm, height of 1.25 cm and the aperture's diameter of 1.2 cm. More importantly, the historic object is covered in decorations in the form of omni-directional grooves. D. Dominiczak-Głowacka made a quantitative list of a hundred and seventy two analysed spindle whorls from the pits. In pit no. 14, the biggest number was found including two stone objects taken into account by the author[41]. The remaining three stone spindle whorls were discovered in pits no. 16, 26 and 36. Only one out of five discussed stone spindle whorls (MPP/GRZ/1392) was discovered in a structure (structure 75/2).

D. Dominiczak-Głowacka concluded that "a quantitative analysis of the spindle whorls in the pits and structures does allow to fully recognise the object's actual occurrence in the Grzybowo stronghold as too little of the site has been examined. Therefore, it is impossible to unambiguously determine the locations where the in-

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36 This issue will be certainly explained following future specialist, microscopic analyses of the historic objects.

37 D. Dominiczak-Głowacka, *Przęśliki*, p. 246.

38 J. Skoczylas, *Użytkowanie surowców*, p. 71.

39 Ibidem.

40 D. Dominiczak-Głowacka divided the intact spindle whorls into five groups. The criterion she used was their shape; subsequently, she identified the following spindle whorls: double-conic with sharp curves of the cones, double-conic with rounded curves of the cones, concave, round and irregularly shaped: D. Dominiczak-Głowacka, *Przęśliki*, p. 250.

41 Ibidem, pp. 250, 252–256.

habitants of the early-medieval stronghold produced and used this item in everyday life"[42]. It is impossible to deny this statement. A quantitative distribution of the spindle whorls in the examined area is not equal. Notably, this type of objects was not found in the pits located in the north-east of the stronghold.

Stone balls

Stone balls have also been found among the historic objects excavated in the medieval sites. Literature on the subject presents an interpretation according to which they were objects for projectile weapon[43]. On the other sites, this type of artefacts made from clay were also found. They are typically identified as game balls[44]. The stone balls have also been interpreted as elements of a pendulum[45]. A review of the existing literature does not allow to define unambiguously the function of this type of historical objects[46]. Four stone balls were found in the Grzybowo stronghold (MPP/GRZ/1020, MPP/GRZ/1356, MPP/GRZ/1748, MPP/GRZ/1777); they are small and oval (length from 2.0 cm to 3.0 cm; width from 1.8 cm to 2.7 cm and thickness from 1.3 cm to 2.4 cm). They come from several pits (17, 35, 41, 43). Only one of the stone balls with a polished surface assumed rather regular shapes (MPP/GRZ/1356) and was probably made of limestone. The remaining three have rugged and weathered surfaces which makes identification of the raw materials more difficult. Most probably, one of them was made from limestone (MPP/GRZ/1748), one perhaps from granite (MPP/GRZ/1777). As for the third one, without additional tests it is impossible to identify the material.

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42 Ibidem, p. 256.

43 J. Wrzesiński, *Theutonici fundas cum lapidibus rotabant – proca broń zapoznana*, Studia Lednickie 6 (2000), pp. 127–128.

44 J. Kaźmierczyk, *Kamień w kulturze*, p. 196; T. Borkowski, *Rozrywka – zabawki i drobna plastyka figuralna*, [in:] *Ze studiów nad życiem codziennym we wczesnośredniowiecznym mieście. Parcele przy ulicy Więziennej 10–11 we Wrocławiu*, ed. C. Buśko, J. Piekalski, Wrocław 1999, p. 198.

45 Ibidem, p. 196.

46 Cf. the footnotes above, also: J. Niezgoda, *Wybrane aspekty zastosowania procy ręcznej w świetle badań eksperymentalnych*, a typescripts of an MA thesis stored in the archive of the Institute of Archaeology of the Wrocław University, Wrocław 2012; E. Lisowska, *Wydobycie i dystrybucja*, p. 162.

Others

In the course of research into the stronghold, a stone object was excavated and identified as an anvil[47]. The alleged anvil[48] was discovered in a structure located in a levelled internal part of the embankment. During archaeological excavations, it was deemed a smithy attributed to the youngest stage of the stronghold's development, most probably the early 11th century[49].

Another interesting artefact is a door hinge discovered in 1992 (MPP/GRZ/837 – no information about the location). The object has a quadrilateral cross-section and was made from granite. Its height amounts to 6.2 cm, its length to 16.8 cm, its width to 14.7 cm. The hollow's diameter reaches 5.85 cm, its depth 3.65 cm. The lower part of the object was polished to obtain a flat surface.

The collection of stone objects in question also contains forty eight historic objects/stones which are hard to identify due to the condition of some of them or the fact that only fragments have survived. However, they bear traces of processing and for this reason they have been taken into account in a table specification, supplementing information about how much of which raw material was used by the stronghold's population (Table 1, 2).

In the site in question, the stone objects were accompanied by fragments of a stone axe (MPP/GRZ/778) made of basalt. It had an oval cross-section, an irregular shape and a polished external surface. Another finding from the stronghold is a semi-product of an axe made from limestone (KW97/90). The MPP/GRZ/778 object was discovered in the course of excavations carried out in 1992 while KW97/90 was found in 1990. Unfortunately, there was no data about the objects' specific locations. Notably, this type of historic objects was found in the

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47 Z. Kurnatowska, M. Tuszyński, *Gród wczesnopiastowski w Grzybowie pod Wrześnią*, [in:] *Archeologia powiatu wrzesińskiego*, ed. M. Brzostowicz, Poznań–Września, p. 181.

48 The collection of the Archaeological Reserve of the Grzybowo stronghold includes an artefact with an inventory number MPP/GRZ/1056 and described as a stone anvil (made most probably from amphibolite). However, following verification, the object cannot be deemed an "anvil". It seems that objects have been swapped. While the original "anvil" was made of limestone, bore traces of processing, the traces were not of a smith's work as the surfaces were smooth and without bruising. At present, it is impossible to define what function the object performed.

49 Z. Kurnatowska, M. Tuszyński, *Gród wczesnopiastowski*, p. 181.

stronghold also in the 19th century[50]. However, we do not associate these objects with the early Middle Ages. During surveys of the stronghold, in the arable layer and the deposition of the embankment, a large number of objects was registered (tools, cores) together with flint production waste. They were located in the so-called secondary deposit, transferred to the stronghold as a result of earth work in the course of constructing the embankment, during levelling works. The form, the mode of handling clearly indicate the late Palaeolithic, the Mesolithic and the Neolithic. For this reason, they have been excluded from this analysis.

The discussed stone objects were discovered in thirty three pits out of sixty explored in 1989–2007. The total number of the stone objects amounts to one hundred and twenty of which three were not defined with respect to their location or the information was unclear. In sixteen out of thirty three pits, one single specimens were found. The biggest number of stone objects was in pit 14 (thirteen specimens). In the north-eastern part of the stronghold, only one object was found, in pit 53 (Figure 1).

Table 1. A quantitative specification of stone objects found in pits.

Pit	Number and type of artefacts	Total
2a	A grinder (?)[A]	1
2b	A grinder	1
4	A sharpening stone	1
6	A sharpening stone, a grinder, a stone with traces of processing	3
7	A grinder	1
10	A grinder	1
11	2 stones with traces of processing	2
12	6 sharpening stones, a grinder, a stone with traces of polishing	8
14	6 sharpening stones (1?), a grinder, 2 spindle whorls, 4 stones with traces of polishing	13
15	Grindstone (?), a grinder, a stone processed on one side, with a basin	3
16	2 sharpening stones (1?), 2 grinders, a spindle whorl, 4 stones with traces of polishing	9
17	A grindstone, a stone ball, 2 stones with traces of polishing	4
18	A sharpening stone	1
22	A sharpening stone (?)	1
24	A stone with traces of carving	1
25	A grinder	1
26	2 sharpening stones, a spindle whorl, 2 stones with traces of polishing, a fragment of an unidentified stone tool	6
27	A stone with traces of polishing	1
28	A stone with traces of polishing	1
29	2 sharpening stones, a stone with traces of processing – trachyte	3
30	A stone with traces of polishing	1

[50] *Słownik geograficzny*, p. 895.

32	A grinder(?), a stone with traces of polishing	2
35	A stone ball	1
36	A spindle whorl, a stone with traces of processing	2
41	3 sharpening stones, a stone ball	4
43	3 sharpening stones, a stone ball, 2 stones with traces of polishing	6
46	A sharpening stone, a stone with traces of cutting	2
49	2 sharpening stones, a grinder, a stone with traces of polishing, a stone with traces of processing (?)	5
51	3 stones with traces of processing, 3 sharpening stones	6
53	A fragment of an unidentified stone tool	1
54	A stone with traces of processing (?)	1
I/005	A sharpening stone, a stone with traces of burning, a stone with traces of carving	3
I/006	A sharpening stone	1
	No information about the location	23

[A] A number accompanied by a question mark in parentheses: object's function uncertain.

The material most frequently used in production of everyday use items was limestone, followed by phyllite used exclusively to manufacture sharpening stones[51]. A similar frequency in using the materials was recorded in a different, early medieval stronghold in Wielkopolska, in Ostrów Lednicki[52]. Frequent use of limestone, quartz limestone and phyllite was also typical of the early medieval sites in Wolin and Szczecin[53]. In each of the sites, imported phyllite was largely applied. J. Skoczylas noticed that phyllite rocks from which sharpening stones were made prevailed in the strongholds in Poznań, Santok and Międzyrzecz; this "unambiguously defines the scale of the imports of the material"[54]. The limestone from which three spindle whorls from Grzybowo were made most probably comes from less distant locations (the vicinity of Rożniatów and the region of Piechcin – Barcin – Wapienno).

Table 2. The raw material structure of objects made from rock

	Material	Number and type of object	Total	%
1.	Limestone	Sharpening stones (15–1?)[A], grinders (11–2?), stones bearing traces of processing (23-[11?]), grindstones (2), stone balls [2?]	53	44,1

[51] Preliminary characteristics, on the basis of a morphological analysis.

[52] J. Skoczylas, *Użytkowanie surowców skalnych*, pp. 68, 117–118.

[53] A. B. Kowalska, *Życie codzienne mieszkańców wczesnośredniowiecznego Szczecina w świetle źródeł archeologicznych*, [in:] *Szczecin wczesnośredniowieczny. Nadodrzańskie centrum*, Warszawa 2011, p. 249; M. Szydłowski, *Wstępna analiza*, pp. 45–51.

[54] J. Skoczylas, *Użytkowanie surowców*, p.71. Cf. B. Banach, *Zabytki wydzielone z warstw wczesnośredniowiecznych grodu i podgrodzia (stan. 1 i 1a)*, [in:] *Międzyrzecz. Gród i zamek w wiekach IX-XIV*, ed. S. Kurnatowski, Warszawa 2015, pp. 294–295.

2.	Phyllite	Sharpening stones (23)	23	19,2
3.	Granite	Grinders (5–1?), stones bearing traces of processing (7 incl. dubious [2?], one may be granite pegmatite), a grindstone [granite pegmatite?], stone ball [1?], door hinge (1)	15	1 2,5
4.	Basalt	Stones bearing traces of processing (6)	6	5
5.	Limestone	Spindle whorls (3), a stone bearing traces of processing (1)	4	3,3
6.	Diorite	A grinder (1?), a stone bearing traces of processing ([1?])	2	1,7
7.	Gneiss	A sharpening stone (1?), a stone bearing traces of processing (1?)	2	1,7
8.	Diabase	A sharpening stone (1?)	1	0,8
9.	Trachyte	Stones bearing traces of processing (2?)	2	1,7
10.	Andesite	Stones bearing traces of processing (1?)	1	0,8
11.	Quartzite	A stone bearing traces of processing (1?)	1	0,8
12.	Porphyry	A stone bearing traces of processing (1?)	1	0,8
13.	Amphibolite	A stone bearing traces of processing (1?), a grindstone (1?)	2	1,7
14.	Ochre	A piece	1	0,8
	Indeterminate	3 stones bearing traces of processing, a stone ball, 2 spindle whorls	6	5

[A] A number accompanied by a question mark in round parentheses: object's function uncertain; A number accompanied by a question mark in square parentheses: an uncertain number of historic objects, doubts related to the used material.

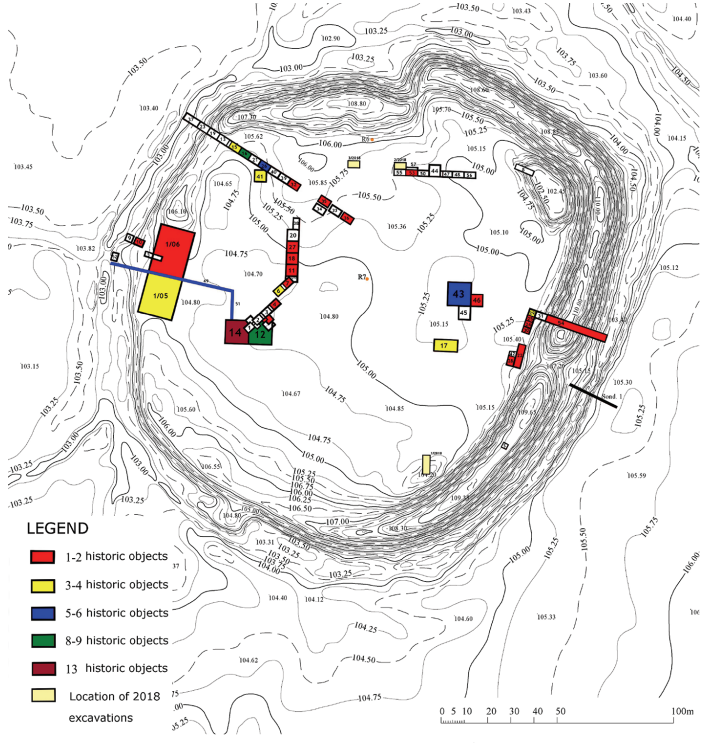

Fig.1. Quantitative distribution of stone objects in the pits (A. Głód and W. Małkowski)

Ornaments – beads

Beads represent a separate category of objects made from stone, registered in the course of surveying the Grzybowo stronghold. To date, thirty nine specimens have been identified. Most probably, they were a part of a necklace typically made from various materials. In the stronghold, twelve beads were found made from carnelian (one more bead was probably made from this material), four made from rhinestone (plus a single fragment of rhinestone, perhaps a semi-product, KW 2527/03). An analysis was also carried out on amber beads. Unfortunately, only three out of eight are intact; one of them is probably a contemporary object (KW 2717). Another finding was an unprocessed fragment of amber without patina which also may be of contemporary origin (MPP/GRZ/1429). One bead was probably made from granite (MPP/GRZ/196). As for the remaining thirteen beads, the materials are hard to identify.

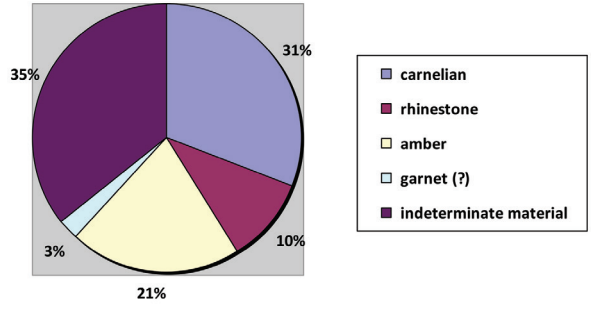

Fig. 2. Materials represented by the beads found in the Grzybowo stronghold

Among the twelve beads made from carnelian, one is round (MPP/GRZ/757). Its diameter amounts to 1.3 cm, the hole's diameter is 0.15 cm. The way in which the stone beads were processed indicates two major techniques. The first one, related to the so-called cabochons, is used in finishing round beads and was employed in processing this historic object. The other technique is related to the so-called facet; as a result, facets are made on the surface of the bead, arranged in some sort of geometric patterns[55]. The collection comprises ten carnelian beads whose surfaces were carefully worked

[55] E. Lisowska, *Wydobycie i dystrybucja*, p. 144. Cf. P. Gunia, *Gemmologia praktyczna dla geologów*, Wrocław 1996, p. 15.

by means of this technique (MPP/GRZ/385, MPP/GRZ/424, MPP/GRZ/868, MPP/GRZ/947, MPP/GRZ/1211, MPP/GRZ/1592, MPP/GRZ/1872, MPP/GRZ/2021, KW2615/04; IZW 2748/07). Among the beads made from carnelian, agate (also a variety of chalcedony), rhinestone processed by faceting, Callmer identified several sub-types found also in the Grzybowo site: "cuboidal beads, prismatic beads with cut corners; round beads, hexagonal-octagonal with triangular to hexagonal facets; oblong beads with facets with hexagonal to octagonal cross-sections"[56]. Out of the five intact specimens, two represent the oblong beads sub-type with facets with hexagonal to octagonal cross-sections (MPP/GRZ/1872, KW2615/04). Their length ranges from 0.8 cm to 1.3 cm, the width from 1.1 cm to 1.5 cm, the thickness from 0.6 to 0.7 cm. The two remaining historic objects (MPP/GRZ/424, MPP/GRZ/1211) represent the cuboidal sub-type of beads with cut corners. Their length ranges from 0.8 cm to 1.0 cm, the width from 0.65 cm to 1.0 cm, the thickness from 0.5 cm to 0.8 cm. The last intact polyhedral bead (IZW2748/07) is very flattened. Its dimensions are 1.0x1.0x0.3 cm while the hole's diameter amounts to 0.1 cm.

A unique carnelian bead (MPP/GRZ/1161) has a round cross-section and a cylindrical shape. Its surface is ornamented with two omni-directional grooves with 4 small circles and a rhombus inlaid with a white substance between them. X-ray fluorescence (XRF) was the basis of an attempt at reconstructing the process of making the ornament which could have been as follows: "the pattern was drawn on carnelian with solution of alkaline and the bead was heated and the permanent white ornamentation appeared"[57].

Among the beads made from rhinestone, three are round (MPP/GRZ/990, MPP/GRZ/1168, MPP/GRZ/1425). Their diameters range from 0.7 cm to 1.2 cm. Their surfaces are carefully processed, polished. In one bead made from this material (MPP/GRZ/1511), faceting was used to work on the surface. According to Callmer, this specimen is from the round beads sub-type, hexagonal-octagonal with triangular to hexagonal facets[58]. Its diameter amounts to 0.85 cm. The piece of rhinestone is reminiscent of the oblong beads subtype with facets with hexagonal to octagonal cross-sections; the historic object does not have a hole.

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[56] E. Lisowska, *Wydobycie i dystrybucja*, p. 114, from J. Callmer, *Trade beads and bead trade in Scandinavia ca. 800 – -1000 A.*, Bonn 1977.

[57] L. Kozak, P. Niedzielski, K. Jakubowski, A. Michałowski, M. Krzyżanowska, M. Teska, M. Wawrzyniak, K. Kot, M. Piotrowska, *The XRF map ping of archaeological artefacts as the key to understanding of the past*, Journal of X-Ray Science and Technology 24 (2016), p. 431.

[58] J. Callmer, *Trade beads*. According to E. Lisowska, *Wydobycie i dystrybucja*, p. 144.

Amber was another material used to make beads. Amber ornaments were round/oval, as indicated by an object with inventory number IZW 2841 and fragments of four other specimens (MPP/GRZ/1247, MPP/GRZ/1277, MPP/GRZ/1278, MPP/GRZ/2047). An intact object has the following dimensions: height 0.7 cm, diameter 0.88 cm, hole's diameter 0.18 cm. A fragment of a historic object (KW1824/99) has a different shape: elongated, rotund and, most probably, it had an oval cross-section. As for the two remaining intact historic objects, one (MPP/GRZ/402) has a flattened, oval shape and a convex cross-section. It is 0.95 cm long, 0.75 cm broad, 0.3 cm thick with the hole's diameter of 0.13 cm. The other bead is probably a contemporary product (KW2717/06) of a rectangular shape and a pentagonal cross-section; it was made by means of a different technique.

The collection in question includes also a historic object made most probably from garnet (MPP/GRZ/196). It is a piece of an irregularly shaped bead; a part of its surface is covered with decorative facets. The piece in question is 1.2 cm long.

It is difficult to identify the materials from which the remaining beads were made. This group includes four oval beads (MPP/GRZ 1279; MPP/GRZ/1445; MPP/GRZ1472; MPP/GRZ1794; MPP/GRZ1829). Three of them are flattened and have concave cross-sections (MPP/GRZ/1445; MPP/GRZ1794; MPP/GRZ1472). The remaining intact specimens include one dark yellow bead, with an irregular cross-section and a shape reminiscent of a rectangle with cuts (MPP/GRZ/1927), a bead with a polygonal cross-section, with traces of cuts on the surface, dark-coloured (carnelian?) (MPP/GRZ/489), a white bead (perhaps made of limestone), elongated with an octagonal cross-section (MPP/GRZ/534), an irregularly shaped bead with an irregular cross-section (MPP/GRZ/1461), an irregularly shaped bead with a round cross-section (MPP/GRZ/1464) and a round bead with a hexagonal cross-section with facets on the surface (MPP/GRZ/1518). The collection also consists of three partly retained historic objects, one with a round cross-section and a cylindrical shape (MPP/GRZ/1623); the other one has a pentagonal cross-section and a quadrangular shape (MPP/GRZ/1096) and a historic object which originally had probably a round shape and cross-section (KW 1805/96).

When examining historical objects like beads, attention should be paid to the fact that the material's origin, including carnelian or rhinestone, poses a problem. This stems from the specificity of the material and the research methods employed that would prevent destruction of the object. Rhinestone (a colourless, transparent variety of quartz) was used by humans back in the Palaeolithic; however, as beads production material it was employed since approx. 1500 BC in India. It was also

used in ancient Egypt, Greece, Rome, China and Japan. In Europe, Alpine deposits were exploited at that time[59]. As we know, the nearest deposits of rhinestone are in the Sudetes[60]. Perhaps the historic objects from Grzybowo should be attributed to the deposits in Lower Silesia or Moravia. Most scholars acknowledge that the rhinestone comes from the Sudetes or, to be more precise, from Jegłowa where quartzite and quartzite-sericite slates were explored in the Middle Ages. The local origin of this material is corroborated by a rhinestone processing workshop discovered on Ostrów Tumski in Wrocław coupled with unprocessed lumps of the material found in Lower Silesian sites[61]. However, items made from rhinestone extracted in an early-medieval ducal stronghold in Poznań were probably made from Moravian material as proven by the results of Raman scattering[62]. More precise analyses of the items from Grzybowo would provide information about the origin of the material used to make these beads and would indicate the distribution routes.

Another material made to produce beads was carnelian (a variety of chalcedony). This mineral also enjoyed popularity since the ancient times; it was extracted in Egypt and Arabia. In Poland, carnelian deposits are in the Sudetes and the Świętokrzyskie Mountains, to name a few[63]. According to E. Lisowska who refers to earlier research, extraction of carnelian, agate or fluorite in the Sudetes outcrops is not so certain. Lisowska claims that the distribution of these items may be evidence of their Eastern origin although it is not possible to exclude a possibility of use of the Sudetes deposits[64]. The issue necessitates further research.

The collection also consists of one partly retained bead made most probably from garnet (MPP/GRZ/196). The item under discussion has an irregular shape. The retained piece is 1.2 cm long and has decorative facets on the surface. There are

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59 Eadem, *Wydobycie i dystrybucja*, pp. 144–145. G. Rapp, *Archaeomineralogy, Natural Science in Archaeology*, Berlin – Heidelberg 2009, p. 94.

60 E. Lisowska, *Wydobycie i dystrybucja*, pp. 144–145.

61 Eadem, *Średniowieczne i nowożytne*, pp. 224–225.

62 M. Sachanbiński, H. Koćka-Krenz, J. Skoczylas, R. Girulski *Wstępne dane o kamieniach szlachetnych z książęcej części grodu poznańskiego (X/XI wiek) w świetle badań gemmologicznych*, [in:] *Petroarchaeology in the Czech Republic and Poland at the beginning of the 21st century*, ed. A. Přichystal, L. Krmíček, M. Halavínová, Brno 2008, p. 134.

63 H. Koćka-Krenz, *Pracownia złotnicza na poznańskim grodzie*, [in:] *Świat Słowian wczesnego średniowiecza*, eds. M. Dworaczyk, A.B. Kowalska, S. Moździoch, M. Rębkowski, Szczecin–Wrocław 2006, p. 265.

64 E. Lisowska, *Średniowieczne i nowożytne*, pp. 224–225.

small outcrops of garnet in Lower Silesia. The closest large deposits of the material are in Bohemia and Saxony[65].

In the Grzybowo stronghold, amber beads were also found. Just like the materials described above, amber is regarded one of the most important luxurious goods from the Baltic zone. Amber beads were found in other early-medieval strongholds. Some of them were located in Wielkopolska, e.g. the stronghold on Ostrów Tumski in Poznań (Zagórze)[66], Międzyrzecz[67] and Kruszwica in Kuyavia[68]. Amber ornaments were popular also in early-medieval sites from Silesia (incl. Wrocław-Ostrów Tumski, Opole-Ostrówek)[69] and in Chełmno Land[70] and, mostly, in Pomerania[71].

The historic objects made from the above described materials were probably imported. Except for one piece of rhinestone (semi-product?), the collection from the Grzybowo stronghold did not consist of lumps of the materials from which they were made. The excavations carried out to date do not indicate workshops where beads were produced in the stronghold; the beads were most probably exchanged in trade.

Only one bead was excavated inside a structure (MPP/GRZ/424, a ceiling of a structure 24). A majority of the items were found in pits 14 and 26; there is no information about the location of the two remaining beads.

Table 3. A quantity and material specification of stone beads in pits

Pit	Material	Inventory no.	Structure/loose	Total
12	Garnet (?) Indeterminate	MPP/GRZ/196 MPP/GRZ/534	- -	2

65 H. Koćka-Krenz, *Pracownia złotnicza*, p. 265.

66 M. Kara, M. Makohonienko, *Wielkopolska krainą grodów – krajobraz kulturowy kolebki państwa polskiego w świetle nowych ustaleń chronologicznych,* Landform Analysis 16 (2011), p. 20.

67 B. Banach, *Zabytki wydzielone*, p. 303.

68 W. Dzieduszycki, *Kruszwica – piastowska domena na Gopłem*, [in:] *Pradzieje Wielkopolski. Od epoki kamienia do średniowiecza*, ed. M. Kobusiewicz, Poznań 2008, pp. 407, 411.

69 A. Pankiewicz, S. Siemianowska, K. Sadowski, *Wczesnośredniowieczna biżuteria szklana z głównych ośrodków grodowych Śląska (Wrocław, Opole, Niemcza)*, Wrocław 2017, pp. 20, 40.

70 W. Chudziak, M. Weinkauf, E. Siemianowska, J. Bojarski, B. Kowalewska, P. Szczepanik, J. Abramow, D. Bienias, D. Makowiecki, *Domniemana karczma z wczesnośredniowiecznego zespołu osadniczego w Kałdusie na Pomorzu Nadwiślańskim*, Przegląd Archeologiczny 64 (2016), p. 158.

71 B. Lepówna, *Pracownie bursztynnicze w południowo-wschodnim rejonie gdańskiego grodu na przełomie X-XI wieku*, Acta Universitatis Lodziensis.Folia Archaeologica 16 (1992), pp. 209–219; A. B. Kowalska, *Życie codzienne*, pp. 325, 329–330, 334–336.

14	Carnelian Amber Carnelian Carnelian Carnelian (?) Indeterminate	MPP/GRZ/385 MPP/GRZ/402 MPP/GRZ/424 MPP/GRZ/757 MPP/GRZ/489 MPP/GRZ/1096	- - Ceiling in str. 24 - - -	6
15	Carnelian	MPP/GRZ/868	-	1
16	Carnelian Rhinestone	MPP/GRZ/947 MPP/GRZ/990	- -	2
21	Carnelian	MPP/GRZ/1161	-	1
25	Rhinestone	MPP/GRZ/1168	-	1
26	Carnelian Amber Amber Indeterminate Amber	MPP/GRZ/1211 MPP/GRZ/1277 MPP/GRZ/1278 MPP/GRZ/1279 KW 1824/99	- - - - -	5
30	Amber	MPP/GRZ/1247	-	1
33	Indeterminate	MPP/GRZ/1464	-	1
35	Indeterminate	MPP/GRZ/1445	-	1
41	Rhinestone Indeterminate	MPP/GRZ/1511 MPP/GRZ/1461	- -	2
43	Carnelian Indeterminate Indeterminate Indeterminate	MPP/GRZ/1592 MPP/GRZ/1472 MPP/GRZ/1794 MPP/GRZ/1518	- - - -	4
45	Indeterminate Indeterminate	MPP/GRZ/1829 MPP/GRZ/1927	- -	2
46	Carnelian	MPP/GRZ/1872	-	1
49	Carnelian Indeterminate	MPP/GRZ/2021 MPP/GRZ/2020	- -	2
51	Amber Rhinestone (half-product?)	MPP/GRZ/2047 KW 2527/03	- -	2
53	Amber	KW2717/06 (probably modern)	-	1
54	Carnelian	KW2615/04	-	1
55	Carnelian Amber	2748/07 2841/07	- -	2
No information	Rhinestone Indeterminate	MPP/GRZ/1425 KW1805/96	- -	2

The stronghold in Grzybowo was among the major early-Piast strongholds built in Wielkopolska which, together with the other strongholds in Gniezno, Giecz, Ostrów Lednicki, Ostrów Tumski in Poznań and Ląd were at the heart of the emerging Piast dominion[72]. They were built "from scratch", fortified, located in naturally

[72] Z. Kurnatowska, *Wielkopolska – kolebką państwa polskiego*, [in:] *Studia nad dawną Polską*,

defensive locations. What is more, they were raised in a relatively short time, where considerable effort and means were invested which is evidence of their important role. Their emergence must have been related to an efficient organization. In all these sites, prestigious items of foreign origin were found which confirms the strongholds' significance[73]. A large part of the stone items found in Grzybowo represents luxurious goods whose form is different from items fulfilling basic needs. These items could have been traded or looted in war[74]. A large part of the utilitarian objects are represented by carefully crafted sharpening stones made from phyllite. This holds true for other early-medieval strongholds in the south-west of Poland. The specimens from the Grzybowo stronghold represent a morphotype indicating their Scandinavian origin. We can therefore assume that they are evidence of considerable Scandinavian influences. Stone objects must have reached Wielkopolska via the Baltic trading centres including Wolin, Kołobrzeg and Gdansk[75]. The contacts with the Baltic zone are also corroborated by the presence of amber beads in the Grzybowo stronghold. Beads made from semi-precious stones: carnelian and rhinestone, were also traded. The materials come from outcrops in the Sudetes. However, E. Lisowska says that the carnelian beads could have come from the east. As for the beads made from rhinestone, it could have been extracted in Lower Silesia or Moravia. These issues necessitate further research. Items made from other materials are equally numerous. While they are not discussed in this article, their presence confirms the significance of the Grzybowo stronghold[76].

Unfortunately, a quantitative and material analysis of the remaining stone objects related to the stronghold inhabitants' lives provides only limited information. The data at hand is largely affected by the fact that the stronghold has been examined only to a small extent. Still we know that in the stronghold, local erratic stone material was used together with materials brought from more distant outcrops. Inter-

vol. 1, ed. T. Sawicki, Gniezno 2008, pp. 26–27; eadem, *Początki i rozwój państwa*, [in:] *Pradzieje Wielkopolski. Od epoki kamienia do średniowiecza*, ed. M. Kobusiewicz, Poznań 2008, pp. 319–331 (zwłaszcza s. 321). Cf. M. Danielewski, *Władztwo Mieszka I – kraina grodów*, [in:] *Stilo et animo. Prace historyczne ofiarowane Tomaszowi Jasińskiemu w 65. rocznicę urodzin*, eds. M. Dorna, M. Matla, M. Sosnowski, W. Baran-Kozłowski, Poznań 2016, pp. 477–485.

73 M. Kara, M. Makohonienko, *Wielkopolska krainą grodów*, pp. 21–22.

74 M. Brzostowicz, *Bruszczewski zespół osadniczy we wczesnym średniowieczu*, Poznań 2002, p. 220.

75 E. Lisowska, *Wydobycie i dystrybucja*, p. 250.

76 Z. Kurnatowska, M. Tuszyński, *Wyroby rogownicze z wczesnopiastowskiego grodziska w Grzybowie pod Wrześnią*, [in:] *Res et fontes. Księga jubileuszowa dr Eugeniusza Cnotliwego*, eds. T. Galiński, E. Wilgocki, Szczecin, pp. 257–263.

estingly, few stone items were found in pits located in the north-east part of the stronghold (only one specimen). As for beads, only three were discovered in this part of the stronghold (one in pit 53, two in pit 55).

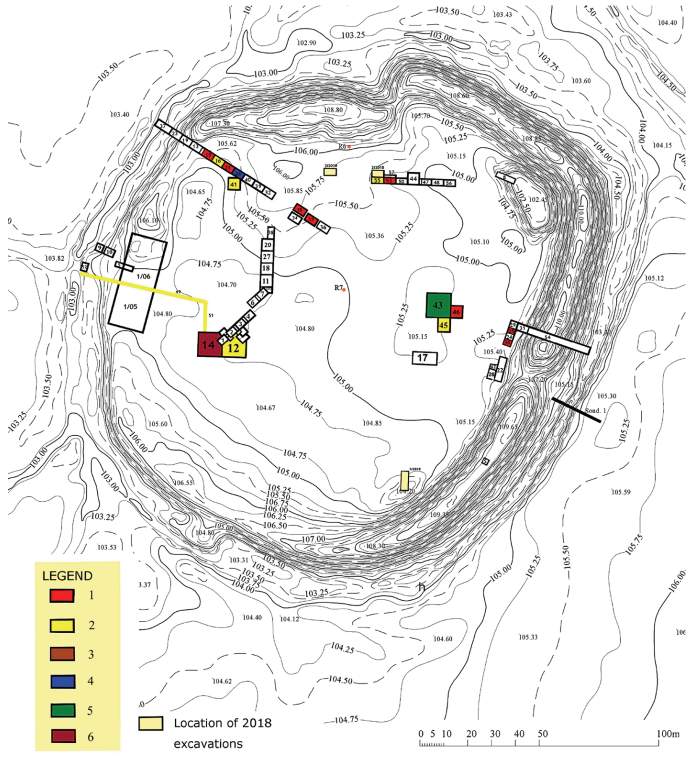

Fig. 3. Quantitative distribution of stone beads in the pits (A. Głód and W. Małkowski)

Nadesłany: 14 II 2019
Nadesłany po poprawkach recenzyjnych: 30 III 2019
Zaakceptowany: 1 IV 2019

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Sharpening stones, beads, spindle whorls and other stone artefacts from an early-medieval stronghold in Grzybowo

The gord in Grzybowo (Września commune, Września county) is among the most mysterious and also the biggest facilities of the type from the early Middle Ages located in the heart of the Piast dominion. It was "discovered" by Olgierd Brzeski who initiated in 1989 excavations continued intermittently by 2009. The research carried out to date allows to define the chronological framework of the gord's existence, namely the time between the 1020s and the mid-1050s.

Translated by: Ewa Dratwa