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Tradition and Innovation

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Editorial

This year's volume of *Archaeologia Polona*, subtitled *Archaeology of Post-Medieval Pottery in Poland and Beyond. Tradition and Innovation*, features contributions focused on early-modern ceramics, the majority of which were found across present-day Poland and Czechia. Most of the papers concentrate on synchronic and antithetical processes occurring in pottery-making between the 16th and 18th centuries. These processes were marked with continuity, the persistence of older traditions in technology, style, and ornamentation – but at the same time brought about changes involving innovations in the aforementioned areas introduced during the period under discussion. Recognition of these phenomena and demonstrating their bipolarity, that is their distinctiveness and tight relationship, have been the primary goal of the present publication.

Such a broad range of problems was approached by addressing specific groups of ceramic vessels, including rich and diverse assemblages obtained from larger areas as well as those featuring pottery from a single centre or site. In some cases, the vantage point for the studies was provided by just one item. The contributions are either preliminary reports or synthetic papers. In terms of their geographical span, the presented research focuses predominantly on finds from the northern, central, and north-eastern parts of today's Poland. The rest deal with a single artefact from Sandomierz and post-medieval pottery from present-day Czechia.

According to the intention of the Editors, the presented contributions are intended to answer current demands of the scholarly community related to the ongoing development of historical archaeology and the growing numbers of material sources – ceramic objects from the 16th, 17th and 18th centuries. This way, the contributions to the 59th volume of *Archaeologia Polona* make a reference to the papers published in Polish in 2017, in the journal *Kwartalnik Historii Kultury Materialnej* (cf., Dąbal 2017; Klarecki 2017; Kowalczyk 2017; Lis 2017; Marcinkowski 2017; Meyza 2017; Trzeciecki 2017; Więcek 2017). These were compiled on the basis of presentations given at an all-Poland's conference dedicated to post-medieval pottery, titled *Porcyllena, farfury i glina… Nowożytne naczynia ceramiczne jako źródła archeologiczne. Pochodzenie – zróżnicowanie – odbiorcy* [Porcelain, Faience and Clay… Early-modern Ceramic Vessels as Archaeological Sources. Origin – Diversity – Recipients] and held in the autumn of 2016 (Bis 2016). Another session of this conference series was scheduled in the spring of 2020, but had to be cancelled due to the COVID-19 pandemic. These meetings have been aimed at bringing together Polish scholars interested in studies on this category of finds and at providing this community with a platform for exchange

of knowledge and experiences. Hence, this endeavour fits well into a broader horizon of actions undertaken currently in different parts of the European continent. As such, it will be continued.

The presented volume is composed of eight papers supplemented with a commemoration and three reviews. Two texts can be distinguished as most synthetic – the one authored by Michał Starski, *Continuation or Evolution? Changes in Pottery Production and Vessel Types Used in Pomerelian (Gdańsk Pomerania) Towns in the Early-Modern Period*, and the other by Maciej Trzeciecki, *Post-medieval Pottery in Mazovia and Podlachia (16th–18th Century) – a Preliminary Report*. Both deliver an analysis of complementary processes – transformations in pottery production and the assortment of goods used across Pomerelia (Gdańsk Pomerania), Mazovia, and Podlachia, along with their respective socio-economic backgrounds, in relation to different categories of sites. These three regions were characterised by distinct dynamics of economic development, urbanisation, socio-cultural change, etc. This makes it all the more interesting to trace how these phenomena are reflected in the analysed pottery assemblages, and creates their local specificity, and to what extent they match the European trends of that time. M. Starski's remarks pertain to the 16th century, a transitional period between the late Middle Ages and the early-modern period, and focus especially on finds from smaller Pomerelian townships and the largest urban centre of the region, Gdańsk. M. Trzeciecki, on the other hand, investigates processes spanning several centuries, from the 1500s to the 1800s, on the basis of finds from towns of various sizes and prominence as well as those obtained from royal or aristocratic residences, manor houses of the nobility, and rural areas. Such heterogeneity of the discussed assemblages is their advantage. This way a non-homogeneous picture emerges which unveils the realities of household ceramic vessels and reveals two underlying tendencies: perseverance of earlier manufacturing traditions, especially the greyware, in spite of the parallel appearance and gradual spread of better-quality products (for the 16th century – glazed ware, such as redware and whiteware or white-greyware as well as slipware; whereas for the later periods – faience and porcelain).

Another two texts, by Magdalena Bis and Joanna Dąbal, deal with artefacts still insufficiently researched in the Polish archaeological literature. The paper titled *Slipware from Tykocin Castle (Poland) from the 16th–18th Century* offers an analysis of the type of pottery known in the Polish literature under the name of semi-majolica or pseudo-majolica. It is a kind of redware (predominantly plates and bowls), covered with slip, decorated with painted ornaments, and finished with lead glaze. A morphological-technological analysis of the specimens of this type found within the castle site in Tykocin, Podlachia, is contributive to broader questions related to this category of finds from Poland, such as their provenance, origins, and relevant terminology. The text titled *Modern Ceramic Chafing Dishes in Northern Poland* draws attention to vessels of specific form and function, through the example of finds from two Pomeranian

urban centres – Słupsk and Gdańsk. These are warming dishes, that is, utensils used for holding burning charcoal or other combustible materials, to cook food, or to serve it hot at the table. They take the form of a perforated bowl or pot shaped body with a pedestal or three legs. Usually they have several knobs attached to the rims. Their meticulous description is complemented in the paper with considerations about their provenance, dating of similar specimens from Europe, and patterns of their consumption in the early-modern period.

The next two contributions also deal with vessels of unusual form and function. The first, titled *Stoneware Jars from the 18th Century from the Saxon Palace in Warsaw*, was authored by Ewelina Więcek-Bonowska. The vessels it discusses were made of resistant and impervious material – stoneware – and come in outstanding, four-sided shapes ornamented with royal monograms. They were used to store medical remedies for the court of King of Poland and Saxony Augustus II the Strong. Thus, they represent a group of uncommon artefacts that contribute to the our knowledge of the archaeology of pharmacy.

Three scholars – Piotr Werens, Ireneusz Piwoński, and Aneta Kisielewska – contributed *Historical and SEM-EDS Analysis of a 14th–16th Century Triangular Crucible from Sandomierz, Poland*. They discuss an object from the collection of the District Museum in Sandomierz, of unclear provenance, namely a small crucible with a characteristic triangular perforation and a mark on the bottom. By identifying analogous finds from Central Europe, the authors determined its place of origin (Tulln in Austria) and dating. Additionally, archaeometric analyses allowed for clarifying the crucible's function – it was used in production of steel by carburising iron.

The question of how Polish research compares to professional studies on post-medieval pottery in the neighbouring Czechia is addressed in Gabriela Blažková's *Current State of Knowledge of the Development of Early Modern Ceramics in the Czech Republic*. The author provides a concise summary of the developments and research directions from the 1980s up to 2021. Particularly recent years have brought significant achievements in the form of extensive source publications.

An additional article in the volume, unrelated to the main topic, considers *A Unique 14th Century Seal-Matrix from Giebło, Zawiercie District*, prepared by Leszek Krudysz. The subject is a late-medieval seal matrix discovered in Lesser Poland. The author analyzes the form of the object and the meaning of the inscription and the lily motif on it, and attempts to determine the identity of the user for whom it was intended and under what circumstances it could have been made.

The further part of the volume contains a text prepared by Danuta Piotrowska and Wojciech Piotrowski – *John Morton Coles (1930–2020). From Palaeolithic Studies to Wetland Archaeology. A Commemoration*. It presents an outline of the character, life story, academic career, and accomplishments of an outstanding and all-round archaeologist, J. M. Coles. The authors put particular emphasis on the extraordinary

features of Professor Coles, along with his broad research interests and prominent discoveries in prehistory as well as experimental, wetland, and environmental subfields of archaeology. An important part of his professional activity was participation in numerous associations or editorial boards of archaeological periodicals, including *Proceedings of the Prehistoric Society* and *Antiquity*, and popularisation of archaeology.

The volume closes with several reviews of monographs. In keeping with the leading theme of the present volume, Magdalena Bis presents a review discussing a 2019 publication titled *Europa Postmediaevalis 2018. Post-Medieval Pottery Between (its) Borders* (edited by Gabriela Blažková and Kristýna Matějková).

Also related to the archaeology of the modern period is Paul Barford's review of the three volumes released in the years 2019 and 2021, resulting from an innovative interdisciplinary landscape archaeology project carried out near Bolimów in central Poland. This research involves elements of public archaeology and focuses attention on the previously somewhat-neglected archaeological traces and "dark heritage" of the "Forgotten Eastern Front" resulting from the eight-month trench warfare standoff between the Russian and German Imperial armies on Polish soil in 1914 and 1915.

A third review – *Gamzigrad-Studien I. Ergebnisse der deutsch-serbischen Forschungen im Umfeld des Palastes Romuliana*, published in 2020 (edited by Gerda von Bülow and Sofia Petković), is discussed by Alfred Twarecki. These are part of the results of the research on the *Gamzigrad* site (near Zaječar Serbia), i.e., in a vast complex of Roman buildings from the end of the 3rd and the beginning of the 4th century AD in the province of Dacia Ripensis. The book includes: geophysical survey, topographica analysis, prehistory of the landscape of the area, as well as analysis of different categories of finds (pottery, coins, sculpture, mosaics).

It is the Editors' intention that the present papers in the special theme of this volume showcase the diversity of the products of the potter's craft available and used in the discussed period. It is also hoped that they will bring more attention to those types or forms of ceramics which have so far been omitted in Polish publications or under researched. They should also highlight important problems and pave the way for further research and studies. We also hope that they will lead to a wider discussion on ceramics from modern times. Whether this goal has been met and the degree to which the analysed questions deepen our understanding of post-medieval pottery in general, we leave to the judgement of our readers.

Magdalena Bis
Michał Starski
Ewelina Więcek-Bonowska

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Continuation or Evolution? Changes in Pottery Production and Vessel Types Used in Pomerelian (Gdańsk Pomerania) Towns in the Early-Modern Period

Michał Starski[a]

The article discusses changes in production and assortment of the pottery used in towns in Pomerelia (Gdańsk Pomerania) in the early-modern period. These considerations are based on advanced research on late-medieval pottery-making of the region and the relatively poorer state of knowledge about the continuity of transformations at the beginning of the early-modern period. The vantage point for this study is a characterisation of the source base, including both the artefactual and written evidence. This enables the tracing of changes, and characteristic features of goods used, in the 16th century.

KEY-WORDS: ceramics, pottery, Pomerelia, Gdańsk Pomerania, early-modern, towns

INTRODUCTION

The 16th century was a time of significant cultural changes occurring throughout Europe. These transformations were heralded, as evident already at the end of the late Middle Ages, by the dissemination of Renaissance ideas, including the Reformation, as well as developments in material living conditions of the people, for instance in construction technology or assortments of handicraft products available. These aspects fuelled cultural change within different social strata and thus impacted the formation of the modern society. One of the domains showing signs of innovation were households which, as one of the primary areas of functioning of human life, would undergo constant reconfigurations. Against the backdrop of other domains, such as architecture, painting, or fashion history, these reconfigurations have so far not been analysed specifically for the 16th century in relation to the region of Pomerelia (Gdańsk Pomerania).

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The aforementioned situation applies also to pottery production and the variety of available ceramic goods that, in Polish lands, would change relatively little at that time.

This article aims to characterise the pottery production and the assortment of ceramic goods used in Pomerelian towns in the early-modern period. This should enable outlining one of the developmental stages in the history of pottery-making, coinciding with the 16th century and important for understanding adaptations occurring in consumption, the spread of new production techniques and pottery forms, as well as stronger supra-regional relationships and long-range trade in these goods. Within the discussed area, this period saw the establishment of specialised centres of craftsmanship, potentially including pottery production. However, the exact influence of these processes on the subject of research remains vague.

A limitation of these studies is their upper chronological boundary, artificially set to the beginning, or the first half, of the 16th century. Such an approach, so far dictated by research possibilities, openly precludes any characterisation of continuity in the transition between the medieval and early-modern periods. Hence, it is important to consider continuity in regard to distinguishing features of pottery of the declining stages of the late Middle Ages and its evolution in the face of innovations. Addressing this question is currently possible thanks to an increasing amount of material evidence from archaeological investigations, an important supplement to which comes from the written evidence. However, the existing state of research does not enable anything more than outlining the most important tendencies in need of further studies.

TERRITORY

At the beginning of the early-modern period, the urban network in Pomerelia already functioned as a mature structure (Fig. 1). It consisted of 18 smaller townships, whereas a central role was played by the agglomeration of Gdańsk (Biskup 1980: 405; Grzegorz 1988: 49–50; 2007: 120–125; Czaja 2000: 45–65). The smaller towns acted as local centres of handicraft production and trade, with populations not exceeding two thousand residents, as can be inferred from registers preserved in sources written in the third quarter of the 16th century. This group of settlements included several semi-agricultural ones, containing fewer than one thousand individuals. Gdańsk clearly stood out against this background, with a population of above 40 thousand inhabitants (*Źródła dziejowe* 1911: 98–288; Gierszewski 1966: 15–25; Bogucka and Samsonowicz 1986: 373). In the 16th century, it was one of the most important Baltic towns, a centre of culture and trade for the whole Polish-Lithuanian Commonwealth. Thanks to its role in the riverine trade on the Vistula, Gdańsk maintained wide commercial relations with the majority of Polish towns and the main economic centres. Its economic position and cultural influence on the local hinterland were pivotal for the economic situation of the whole

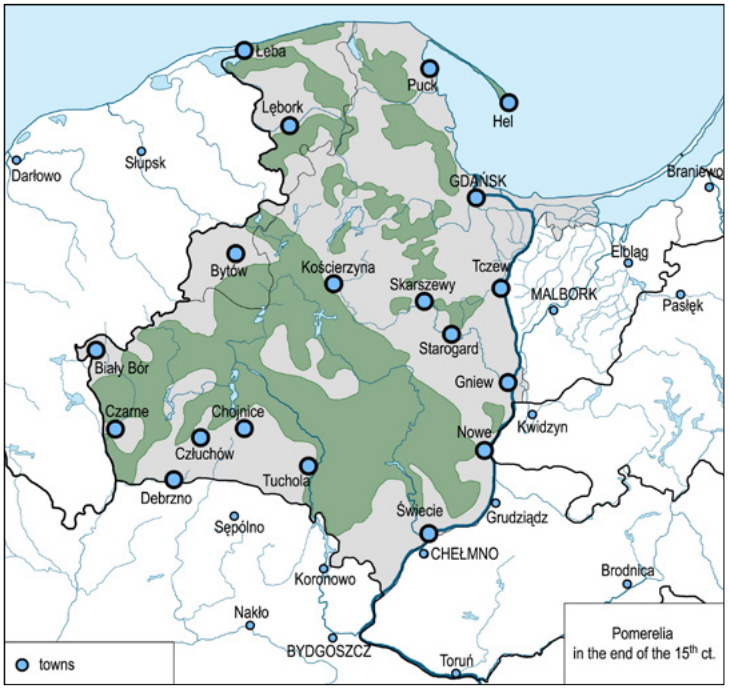

Fig. 1. The Pomerelian urban network in the 16th century shown in the context of the region's afforestation. Prepared by M. Starski.

region in the period under discussion here. Smaller townships, maintaining relations with the main centre, benefitted from its demand for raw materials and handicraft products. Through this process, innovations would find their way into production techniques and assortment of available goods, as well as new ideas. In the majority of the smaller towns, similarly to Gdańsk, the Reformation was gaining momentum, while architecture saw the adaptation of new stylistic solutions (Gierszewski 1966: 12–23; Czaja 2000: 45–65; Grzegorz 2007: 120–125; Ptaszyński 2018: 112–114). In this regard, the discussed period, despite its relatively narrow chronological span, forms a coherent whole in terms of economic and cultural changes.

THE PRODUCTION AND CHARACTERISTICS OF POTTERY AT THE END OF THE LATE-MEDIEVAL PERIOD

The vantage point for studies on early-modern pottery of the region is provided by the previous scholarship on pottery-making and assortment of goods used at the end of

the late-medieval period. Numerous assemblages dated to the earlier of these periods have been obtained in Gdańsk as well as in Chojnice, Lębork, and Puck (Tab. 1). Smaller, but still representative, assemblages have come also from Bytów, Człuchów, Gniew (Tczew distr.), and Skarszewy (Starogard Gdański distr.), whereas finds from Debrzno (Człuchów distr.), Starogard Gdański, Tczew, and Tuchola are of secondary importance. Not all of this material has already been published, but one might list at least about a dozen works and unpublished compilations shedding light on the character of pottery production in Pomerelian towns (see list in Starski 2010; 2016a).

Table 1. Quantification of different pottery types in selected assemblages of ceramic vessels dated to the 16th century from Pomerelian urban centres (Chojnice – after: Walenta *et al.*, 2000: tab. 1; Walenta 2002: tab. 1; Debrzno, Człuchów distr. – Author's unpublished research; Gdańsk – after: Trzeciecka and Trzeciecki 2002; Starski 2003; Lębork – after: Starski 2017: 238–239; Author's unpublished research; Puck – after: Starski 2016b: 238–239; 2019; Skarszewy, Starogard Gdański distr. – Author's unpublished research).

Town/Site/Phase	Number of vessels/ fragments	Types of wares (in %)					
		Traditional ware*	Greyware	Redware	Glazed redware	Stoneware	White-grey ware
Chojnice, Podmurna St., 15th cent. (no. of fragm.)	319	1,6	93,4	1,5	1,8	1,7	0,0
Chojnice, Nowe Miasto St., 15th cent. (no. of fragm.)	732	2,7	94,4	1,2	1,1	0,6	0,0
Chojnice, Nowe Miasto St., first half of the 16th cent. (no. of fragm.)	836	3,1	90,6	3,2	2,5	0,6	0,0
Debrzno, Market Sq. 4, second half of the 16th cent. (no. of fragm.)	452	0,0	21,0	66,2	12,8	0,0	0,0
Lębork, NE quarter of the Market Sq., second half of the 15th cent. (no. of vessels)	458	0,0	86,0	3,5	8,1	2,4	0,0
Lębork, latrine on Wyszyńskiego St., early 17th cent. (no. of fragm.)	706	0,0	12,4	43,3	44,3	0,0	0,0

Town/Site/Phase	Number of vessels/ fragments	Types of wares (in %)					
		Traditional ware*	Greyware	Redware	Glazed redware	Stoneware	White-grey ware
Puck, second half of the 15th cent. (structure in general, no. of vessels)	1 514	5,2	64,1	5,2	18,5	3,5	3,5
Puck, first half of the 16th cent. (structure in general, no. of vessels)	2 621	2,3	50,1	10,1	26,0	2,6	8,9
Puck, town hall, early 16th cent. (no. of vessels)	1 516	0,0	49,7	11,9	25,9	1,7	10,8
Puck, pottery kiln half of 16th cent. (no. of fragm.)	1571	0,5	35,0	50,2	8,4	0,1	5,7
Puck, pottery pile second half of the 16th cent. (no. of fragm.)	1049	1,6	58,8	17,6	17,2	1,5	3,3
Skarszewy, Market Sq., second half of the 15th cent. (no. of fragm.)	174	0,0	74,7	16,1	8,6	0,6	0,0
Skarszewy, Market Sq., first half of the 16th cent. (no. of fragm.)	471	0,0	51,4	36,5	11,7	0,0	0,4
Skarszewy, latrine on Zduńska St., end of the 16th cent. (no. of fragm.)	646	0,0	12,7	61,3	25,7	0,0	0,3
Gdańsk, Powroźnicza St., second half of the 15th cent. (no. of vessels)	498	0,9	74,1	1,0	6,1	17,3	0,6
Gdańsk, Powroźnicza St., first half of the 16th cent. (no. of vessels)	336	0,0	53,0	2,9	29,8	12,0	2,3
Gdańsk Szklary 4–5 St., 15th cent. (no. of fragm.)	464	0,0	78,9	6,4	7,2	6,7	0,8
Gdańsk Szklary 4–5 St., 16th cent. (no. of fragm.)	627	0,0	55,9	6,9	23,8	9,1	4,3

* - as a secondary deposit

In effect, it may be stated that in the second half of the 15th century, the pottery production and structure of goods used in particular urban centres was very similar (Tab. 1). Most prevalent were flat-bottomed vessels fired in a reducing atmosphere, but there was also a noticeable increase in the percentage of pottery fired in an oxidising atmosphere (Walenta 2002: 44–45; Trzeciecka and Trzeciecki 2002: 155–156; Kościński 2003: 364; Starski 2016b: 204–206). This was linked to the spread of the glazing technique among local craftsmen, which is traceable since about the mid-15th century. The composition of the ceramic mass also improved in the same period. Local ceramic goods formed the vast majority of those used, but the contribution of imported stoneware vessels amounted to several percent in the analysed towns (Tab. 1). White-grey ware should also be considered a novelty, noted in small percentages at several sites and imported from outside Pomerelia (Starski 2013; 2016b: 206–210).

There are slight differences in the structure and diversity of pottery forms between particular urban centres (Fig. 2; Tab. 1). For instance, sites located in Gdańsk show a significantly greater share of glazed and stoneware vessels, exceeding 10% (Trzeciecka and Trzeciecki 2002: 156–157; Starski 2003; Kościński 2003: 364). Similar increased percentages are also traceable in some other towns, which may result from their proximity to the sea or to Gdańsk itself (e.g., in Puck, see Starski 2016b: 208–210). Unfortunately, it is currently impossible to determine the exact cause, due to the lack of data from other towns located near the main centre of the region and the low precision of dating of some artefacts. The morphological structure of the vessels shows also a decrease in the number of pots, which remain the most commonly-used form nevertheless, and an increase in bowls, jugs, and lids attesting to a growing diversification of household tableware (Starski 2016b: 190–194).

Despite the overall structure of pots and forms of vessels, the organisation and scale of handicraft production are still under-researched. Only two pottery workshops functioning in the second half of the 15th century have been identified so far (in Gdańsk and Skarszewy). The pace and nature of changes in pottery-making techniques (including glazing) in particular towns remains unknown, just as is the case concerning the number of craftsmen or the extent to which their production influenced other settlements. It seems that the increased intensity of relations with Polish lands traceable since the mid-15th century had a certain impact on the trade in ceramic goods. This can be attested, for example, in regard to white-grey ware manufactured, among others, in Bydgoszcz and Płock (Starski 2016b: 206–210). Finally, another poorly-researched question is the adaptation of new ways in which these goods were used, especially in regard to individual consumption or the use of ceramic platters or plates. What also requires further elucidation is how the increasing availability of metalware and glassware impacted on the overall structure of kitchenware and tableware used in households as well as the competitiveness of particular ceramic products.

Fig. 2. Selected ceramic vessels from Puck from the end of the 15th and early 16th centuries. Photo by M. Starski.

WRITTEN SOURCES ON THE HISTORY OF POTTERY PRODUCTION

The available written sources for the early-modern period enable the reconstruction of the scale of handicraft production in 16th-century Pomerelia. They do not, admittedly, cover the whole period under discussion but still provide data allowing assessment

of the number of potters and thus – the manufacturing output of particular urban communities. Royal inspections from the years 1564–1565 (Hoszowski 1961) and the fiscal register of 1570 (*Źródła dziejowe* 1911: 98–288), despite certain shortcomings of these documents, roughly illustrate the number of potters active in Pomerelia in the third quarter of the 16th century. Apart from that, other municipal sources are available that shed light on the craftsmen's guilds and regulations concerning distribution of goods in some of the investigated towns.

For most of the towns from the third quarter of the 16th century, the aforementioned sources recorded from one to four potters (Fig. 3), while in several rare cases (Świecie, Tczew, Tuchola) from six to twelve craftsmen were mentioned (Gierszewski 1966: 202–203). Again, Gdańsk stands out in that regard, with a potters' guild registered for the first time already in 1374. In the early 15th century, there were 17 potters active in the town, which dropped to 10 in the year 1526. In turn, at the end of the 16th century and in the first half of the 17th century, municipal sources mentioned names of 15 craftsmen of this specialty. Isolated accounts from the same time inform about journeymen, thus allowing for a tentative assumption that the local workshops were rather small. Hence, the scale of their production was in all probability comparably

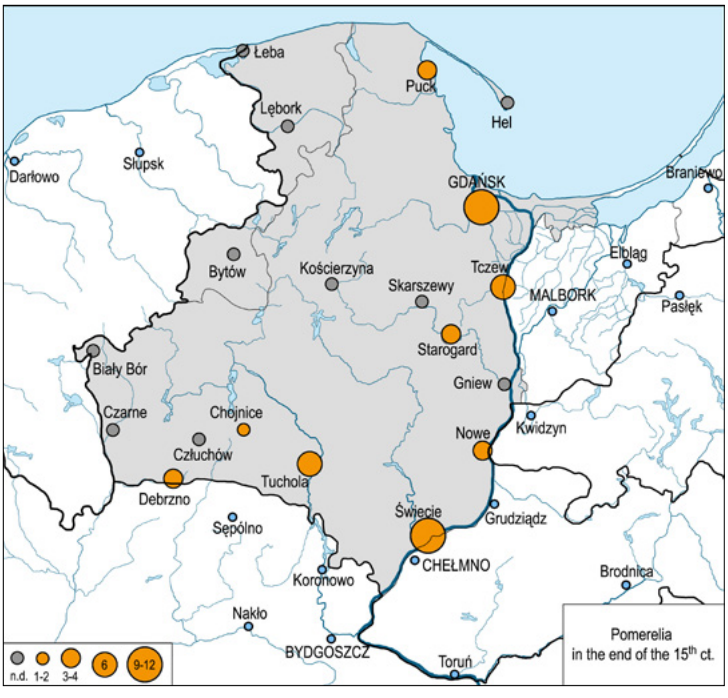

Fig. 3. Number of potters registered in Pomerelian urban centres in 1570. Prepared by M. Starski.

modest. Simultaneously, data available for the 16th, as well as the 17th, centuries show that Gdańsk saw a significant inflow of external goods produced regionally, which prompted some of the Gdańsk craftsmen to requalify into producing stove tiles or glazed vessels (Bogucka 1962: 156–157). On the other hand, data on the potters' guilds operating in smaller towns of the region are very limited. It may be supposed that accounts mentioning three to four potters for some of the towns reflect the functioning of craftsmen's fraternities (e.g., in Puck), whereas smaller numbers should be connected with multi-craft associations.

In the light of the above data, it may be stated that pottery-making could be traced in most of the urban centres in the discussed period. This information arouses questions regarding the scale and character of this production. In the majority of the towns, potters most likely catered for the local markets, as there were few active craftsmen. In the cases of Świecie, Tczew, and Tuchola, the number of craftsmen certainly exceeded local needs, and thus it may be supposed that production in these localities was geared towards external trade. The same is true for Gdańsk's potters who specialised in manufacturing stove tiles and glazed vessels. It is, therefore, possible to hypothesise that there existed regional centres specialised in pottery production. However, this supposition would require verification by future studies.

DISCUSSION

Source basis for the research

Compared to the material described above, the source base enabling characterisation of Pomerelian pottery-making in the 16th century is only slightly less voluminous, but it has certain shortcomings. The largest assemblage of finds comes from Gdańsk. It is necessary to note, for example, recently-published finds from Szeroka Street near the Dominican church (Trzeciecka and Trzeciecki 2002; Oniszczuk-Rakowska 2002; Dąbal and Szczepanowska 2018), the vicinity of the Green Gate (Kościński 2003), the housing quarter on Powroźnicza Street (Starski 2003), the Wisłoujście fortress (Dąbal 2015), and Lastadia (Kościński 2020). Many artefacts have also been obtained from the chartered town and the castle site in Puck (Starski 2009; Kruppé and Milewska 2014; Starski 2015; 2016b); slightly fewer finds have been discovered in investigations in Chojnice, in the market square, on Nowe Miasto Street, 31 Stycznia Street, and near the Jesuit College (Walenta *et al.*, 2000; Garas and Trzciński 2010: 19–29; Trzciński 2011: 103–107); finally, two smaller assemblages come from the north-eastern quarter of housing adjoining the market square and on Wyszyńskiego Street in Lębork (Starski 2017). Therefore there is a representative basis for attempting a synthetic perspective on pottery use in these urban centres. For the remaining 14 towns in the region, only a few have been subjected to investigations, but the material from them

is as yet unpublished or no 16th-century finds have been obtained Człuchów – two excavated urban plots and the castle site,[1] Debrzno – plots in the southern frontage of the market square,[2] Gniew – market square,[3] Skarszewy – excavations within the former mid-market-square housing block (Starski 2018) and finds from Zduńska Street,[4] Tczew – vicinity of Chopina Street (Kochanowski 1995); and Tuchola – Starofarna Street (Kmieciński and Nowakowski 1978). For the others, no precise information is available. The above-mentioned studies and publications are, therefore, obviously valuable for investigation of the matters discussed here, but they shed light only on select areas within the investigated urban centres. This is a major hindrance for drawing conclusions about the entire region of Pomerelia. Nevertheless, the existing evidence allows the formulation of preliminary observations. As a side note to the aforementioned data on ceramic vessels, it is also necessary to mention finds of stove tiles that provide a backdrop for the present discussion. A relatively rich assemblage of renaissance stove tiles (up to several hundred) comes from Chojnice, Debrzno, Gdańsk, Lębork, Puck, and Skarszewy (Starski 2021).

As per the above review, the previous scholarship concerning 16th-century pottery from the investigated province amounts to about a dozen studies and publications dedicated to moveable finds. Many of them reflect their authors' interest in late-medieval artefacts, the youngest of which are sometimes dated to the early or mid-16th century. Such was the case for the finds from Chojnice, Gdańsk, Lębork, and Puck. A characteristic of another group of assemblages is formulated through the analysis of early-modern finds dated to between the 16th and 18th centuries. These publications deal with finds obtained in Gdańsk and smaller towns (Oniszczuk-Rakowska 2002; Garas and Trzciński 2010: 19–29; Dąbal 2015; Starski 2015: 114–120). Some attention has also been paid to the discussion of imported glazed vessels, stoneware, and white-grey ware (Starski 2013; Dąbal 2020). The structure of pottery-making in the 16th century, approached as a separate problem, has so far been addressed in only a single publication which presented the preliminary results of the discovery of a potter's workshop in Puck dated to the second half of the 16th century (Starski 2019). It is difficult not to get the impression, however, that the deeper one goes into the 16th century, the fewer phenomena can be considered certain, especially as compared to the turn between the late-medieval and early-modern periods.

Hence, when addressing the question of production and assortment of goods used in Pomerelian towns in the 16th century, one has to characterise the crucial research areas relevant to studies on manufacturing techniques, the structure of production,

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1 Compiled by the author.

2 Unpublished research results compiled by M. Miścicki.

3 Unpublished compilation of ceramic finds by E. Choińska-Bochdan and W. Pela.

4 Unpublished preliminary compilation of research results by K. Blusiewicz.

the assortment of goods used, and, in effect, also the chronology of innovations. The organisation of production, including the trading and importing of foreign goods, will be discussed as yet another separate issue. Such a perspective on the subject matter will, therefore, require considering differences between particular towns, including Gdańsk. This way, it will be possible to outline the process of transformation in the investigated area in the early-modern period. In terms of chronology, the present discussion spans the period from the early 16th to the beginning of the 17th centuries, since some of the younger assemblages of finds are dated to the turn of these periods. The geographical scope of the study is defined by the borders of the Pomeranian Voivodeship of the First Polish-Lithuanian Commonwealth.

Changes in pottery production techniques and processes

Previous studies on 16th-century pottery from Pomerelia have only briefly addressed the question of pottery production techniques. Issues related to, for instance, vessel forming techniques or composition of ceramic masses have remained largely unexplored, with only slightly more data on changes in frequencies of different types of vessels in particular manufacturing traditions.

The available information regarding the situation at the end of the late Middle Ages allows to assume that at the turn of the 15th and 16th centuries, vessels were formed by coiling and smoothing on a potter's wheel. Such a conclusion stems from an analysis of the vessels from Puck (Starski 2016b: 119–124; 2019: 110–113), that show significant similarities to finds obtained, for example, from Chojnice, Lębork, Skarszewy, and Gdańsk (Trzeciecka and Trzeciecki 2002: 138–139; Starski 2003; 2017: 240). This would indicate that there had not been any major changes in pottery production technique in the investigated period. At the same time, the composition of the ceramic mass improved visibly, which was especially true for glazed redware and achieved through adding a small amount of fine-grained admixture. Finds dated to subsequent decades, for example from Chojnice, Debrzno, and Lębork (north-eastern housing quarter adjoining the market square) show the same characteristics and indicate that the manufacturing techniques detectable at the beginning of the 16th century did not change at least until the mid-16th century. The same situation was reflected by finds from Gdańsk from investigations in Powroźnicza Street and those from the vicinity of the Dominican church (Trzeciecka and Trzeciecki 2002; Starski 2003). Similar data were obtained in Puck from a potter's workshop dated to the mid-16th century (Fig. 4). Compared with such material, assemblages from between the fourth quarter of the 16th and early 17th centuries stand out. These include finds from a latrine in Wyszyńskiego Street in Lębork (Fig. 5), Zduńska Street in Skarszewy, and an urban plot adjoining the market square in Debrzno (Fig. 6), as well as 16th-century assemblages from Powroźnicza Street and the Green Gate in Gdańsk (Oniszczuk-Rakowska 2002; Kościński 2003). In all these places, apart from the improved quality of the

Fig. 4. Selected ceramic vessels from the pottery kiln from Puck, dated to the mid-16th century. Photo by M. Starski.

ceramic fabrics, the walls of the vessels were noticeably thinner and of more delicate structure, which corroborates the hypothesis that the techniques of pottery production had changed. This, in turn, would imply that wheel-throwing was used by the time. The fact that the use of this technique has been confirmed in several places may be considered plausible proof of its being known and used in other urban centres of Pomerelia. It is necessary to remember that the ceramic products market was highly integrated and that the guild structures functioning at the time required aspiring craftsmen to travel and gain practical experience, and this fostered the rapid spread of adaptations or innovations in manufacturing techniques (Tandecki 1986: 276–280). However, the exact moment of the increase in frequency of the use of wheel–throwing is hard to pin-point. On the basis of the currently available data, an approximate time-frame for this process should be determined to have lain between the middle and the end of the 16th century.

Whereas changes in pottery production techniques and preparation of raw materials are traceable since the mid-16th century, the gradual transformations in the structure of the produced vessels can be noticed already at the end of the 15th and throughout the 16th centuries (Fig. 2). The latest research suggest that glazing and the use of an oxidising firing atmosphere were adopted in local production already around the

Fig. 5. Selected ceramic vessels from the cesspit at S. Wyszyńskiego Street in Lębork, dated to the end of the 16th century (1–8 – pots and grapens; 9–12 – plates). Photo by M. Starski.

Fig. 6. Selected ceramic vessels from the pit within the urban plot adjoining the market square in Debrzno, dated to the second half of the 16th century. Photo by M. Starski.

middle of the 15th century. A certain number of such vessels have been registered in Chojnice, Gdańsk, Lębork, Puck, and Skarszewy in layers dated to the third quarter of the 15th century (Trzeciecka and Trzeciecki 2002: 155–156; Kościński 2003: 364; 2020: 30–36; Starski 2016: 204–206; 2017: 241–242). Their frequency typically amounts to about a dozen percent, reaching 20% in Gdańsk and Puck in the first quarter of the 16th century (Tab. 1). However, it remains unknown how firing in an oxidising atmosphere spread in the subsequent decades of the 16th century. The assemblage obtained from the potter's kiln in Puck dated to the mid-16th century is not entirely representative in that regard, as it is smaller than other production sites and most likely reflects a single batch of pottery (Starski 2019). It cannot be denied, on the other hand, that it was designed to produce an oxidising atmosphere and fire redware (Fig. 4). This type of vessels is also prevalent in the vicinity of the workshop, in what is interpreted as a heap of discarded products. It is noteworthy that the majority of these vessels were not glazed, with glazing preserved on less than 20% (Starski 2019: 110–111). Analogous data were provided by slightly less numerous assemblages from a latrine on Wyszyńskiego Street in Lębork, a cesspit on Zduńska Street in Skarszewy, and the refuse dumping pit in an urban plot in the southern frontage of the market square in Debrzno (Tab. 1; Fig. 6).[5]

[5] Unpublished research by the author.

This information indicates that the use of an oxidising atmosphere became common in pottery-making and its frequency in the structure of products increased gradually to reach about 50–70% in the second half of the 16th century. The percentage of glazed ware would also rise, but did not exceed about 30% in the assemblages from the period, with the remaining oxidised pottery unglazed (Tab. 1). The percentage of vessels fired in a reducing atmosphere was lower (about 30–40%). In the case of the potter's workshop from Puck, this type of firing was attested only for pots and bowls, with similar data obtained from the aforementioned sites at Debrzno, Lębork, and Skarszewy. This situation seems to reflect a diversity of firing techniques and, thus, also different manufacturing traditions and the diversity of goods available in the market. This seems to be a consequence of differential supply, encompassing cheaper and more expensive vessels as well as a wide array of products. It would implicitly indicate an increased market demand and, in effect, this would encourage diversification of produced goods. The introduction of more expensive products (most likely glazed vessels) may have also been an attempt at competing with metalware that was gaining in popularity among householders. On the other hand, ceramic vessels would still be indispensable in numerous everyday tasks, such as storage or other housekeeping activities.

Assortment of products

In comparison with the difficulties related to observing evolution in pottery production techniques, changes in assortments of used goods are relatively easier to trace. The evidence (i.e., analysis of ceramic assemblages), is admittedly exactly the same as previously, but new forms of vessels are attested already at the end of the late Middle Ages and the first half of the 16th century. This allows the identification of a trend in changes regarding the forms of vessels and the structure of assemblages.

Since the decline of the late Middle Ages, the percentage of pots dropped from about 50–70% at the end of the 15th century to 40–60% in the first half of the 16th century (Tab. 1). Data for the second half of the latter century are known only from several sites, but they seem to reflect further decrease in the contribution of these vessels to about 40–50%. The pots seem also to have become more diverse in terms of sizes. Greyware and redware pots were medium and large, whereas glazed redware ones were usually medium and small (Trzeciecka and Trzeciecki 2002: 146–148; Starski 2016b: 190–193). The shapes of these vessels underwent a certain evolution too. The ratio between the diameters of bases and mouths increased, with the bases being smaller. Flat-bottomed vessels were still a staple, characterised by the greatest circumference of the body being located in the upper part, often above the two thirds of the height, which made them appear more slender. Among the glazed redware pots, slender shapes as well as tripod forms were more popular, typically with a shorter distance between the shoulder and rim, and often lacking necks (Trzeciecka and Trzeciecki 2002: 146–148; Kościński 2003: 367; Starski 2003; 2016b: 190–193).

Greater popularity seems to have been enjoyed also by bowls, which comprised about 20% of assemblages (Tab. 1). They came in a variety of types and sizes. Such a diversity stemmed from their different uses within households, including housekeeping, cooking, and eating (Fig. 6). Hence, a group could be distinguished that consists of large and very large greyware and redware vessels, both rare in the 14th and 15th centuries. They may have been used in housekeeping as well as for kitchen-related purposes, often replacing pots as food-storage containers. The percentage of smaller bowls also rose, with examples of glazed redware being most common. Their ornamentation and surface finishing technique indicate that they were intended as tableware.

The frequency of jugs changed only slightly, however, their shapes and sizes did evolve (Tab. 1). Greyware vessels polished across their entire surfaces were replaced by specimens in which polishing took the form of a geometrised or symbolic ornament. This category of vessels included small, medium, and large examples. They were typically of spherical shapes with clearly-defined feet or moulded bases. A group of glazed jugs were also identified, usually small or medium-sized, but their frequency was marginal among 16th-century specimens. Pans, on the other hand, were more common than in the late-medieval period (Tab. 1). Their frequency had never been great, due to their specific function, but they were present in the majority of the discussed assemblages, which testifies to their common use in the investigated 16th-century urban centres (Trzeciecka and Trzeciecki 2002: 150; Kościński 2003: 366–367; Starski 2003; 2016: 194).

A new type of vessel were plates and platters. Only single specimens of these types were found in late-medieval contexts, whereas in layers dated to the second quarter and the second half of the 16th century, this group made up almost 10% of vessels (Trzeciecka and Trzeciecki 2002: 150–151; Kościński 2003: 366–367; Starski 2017). Their increased frequency results from changes in food consumption habits among the Pomerelian burghers who would prefer to eat from separate receptacles distributed to individual people at the table. The same custom and popularity of plates and platters could be seen in West-European urban centres, especially in Germany and the Netherlands. Some of the plates were probably of local provenance, but others were imported from the United Provinces of the Netherlands or the basin of the Werra and Weser rivers, which were known centres for production of painted plates and platters (Stephan 1981; 1992; Oosten 2009; *Amsterdam ceramics* 2012). The remaining types of vessels showed little change, but not much can be said about them due to their low frequencies of occurrence. It is plausible to say that the percentage of mugs increased, together with the appearance of new forms equipped with lugs and having proportions similar to cups. The number of goblets, shallow bowls, and roasting pans was also noticeable (Trzeciecka and Trzeciecki 2002: 174–181; Starski 2016b: 188–189).

In the light of the above, it seems that the character of changes in the assortment of goods used in the 16th century does not reflect a major transformation of households

but rather the gradual introduction of innovations. These changes stemmed not only from differences in the structure of the ceramic products used but also from increased frequency of metalware and glassware. The former replaced pots as common all-purpose household vessels. It seems that the use of cauldrons for cooking entailed greater demand for bowls for kitchen and housekeeping purposes other than heating up food over fire. The frequency of table bowls, platters, and plates suggests that these vessels were also often used as a component of a household's tableware. The observed changes provide one more significant insight. They were related to the evolution of food consumption habits across Europe and are testimony of the adaptation of cultural patterns in Pomerelian households (Verhaeghe 1997; Oosten 2009; Blažková 2013; Španihel 2014; Blažková and Žegklitz 2016). This process was most evident in Gdańsk (Oniszczuk-Rakowska 2002: 198–205), but each of the assemblages obtained from smaller townships would support similar conclusions. Hence, this illustrates the rapid spread of these, apparently attractive, new models of consumption even in the smaller urban centres of the region.

CONCLUSIONS AND ORGANISATION OF TRADE

The analysis of the evidence performed here for 16th-century Pomerelian pottery-making is certainly insufficient to enable an authoritative summary of the changes occurring in the investigated period. The preliminary conclusions seem to merely reveal the main trends, leaving numerous questions open for further research.

The presented characteristic of the finds indicates that the trajectories of change traceable at the end of the late Middle Ages continue into the 16th century. This is true, for instance, in regard to the quantities of unglazed and glazed redware vessels present. Their greater frequency enriched the assortment of goods available, since certain types of pottery were fired only with particular techniques. The structure of vessel usage shows a decrease in the frequencies of pots and an increase in other forms. However, this tendency cannot be considered a novelty but rather a successive and slow trend related to improvements in quality and a diversification of production. The rare actual innovations would include the increase in popularity of white-grey ware imported from centres operating within the Kingdom of Poland and the spread of plates and platters used for individual consumption.

A proper overview of the above trends requires referring to the cultural changes and market mechanisms functioning in the 16th century. Increasing diversification of the ceramic market was, on the one hand, a defensive mechanism and pressure exerted on potters by producers of vessels made of other materials (metal and glass), which resulted in improved competitiveness against other craftsmen. On the other hand, such competition would not have been possible without a shift in the needs of

consumers who preferred to buy other products and gather richer assortments of vessel types (Verhaeghe 1997: 31; Oosten 2009: 14; Blažková 2013: 220–221; Španihel 2014: 154–155; Blažková and Žegklitz 2016: 148–163). This was true for both higher-quality vessels used for food consumption and cheaper ones intended for daily housekeeping purposes. Such diversification impacted the assortment of products available for sale, among which the glazed ones were undoubtedly more expensive than greyware or unglazed redware. This was also connected to an enriched repertoire of forms, i.e., a greater number of large pots and bowls, both greyware or redware, used in a variety of ways.

Beyond doubt, the diversification of pottery has one more important aspect. It certainly indicates a different kind of participation of customers in shaping the market. This is evident in the analysed assemblages, which are heterogeneous even within single urban centres. This is most likely a reflection of economic differences but also, potentially, distinct modes of cultural participation and a heterogeneity of customer needs. It may also be perceived as a difference in consumer attitudes and strategies. This phenomenon is, obviously, constantly at play in developed societies, including urban communities, but in the late Middle Ages, with a lower level of wealth and narrower range of goods offered by craftsmen (largely restricted to greyware), the differences in assortment of goods were a result of a limited number of factors (e.g., the presence of imported stoneware or glazed redware).

It is clear, therefore, that pottery-making and the market for ceramic goods in 16th-century Pomerelia reflected diverse consumer attitudes and an increase in expectations coupled with greater spending power. The producers could provide buyers with a morphologically and technologically (and thus functionally) diverse selection of products. An important factor in this process was also the cultural influence of West-European burghers on Gdańsk and, indirectly, on the smaller townships of the region (Gaimster and Nenk 1997; Verhaeghe 1997; Gaimster 2006; Oosten 2009).

The issue of the production capacity of urban potters in Pomerelia require a separate commentary. Undoubtedly, this question has so far been least investigated. The observations outlined above inevitably lead to the conclusion that pottery-making centres functioned in Pomerelia, the productions of which would reach beyond their direct vicinity and circulate in the regional market. As a matter of fact, this possibility has already been proposed for pottery-making in other Polish towns as a factor that shaped their range of influence in similar ways (Kwapieniowa 1976). Although such regionally important centres have not been identified for the discussed province, based on the numbers of potters active in particular smaller towns, it seems that this category would likely include Świecie, Tuchola, and Tczew, as in each of these centres between 6 to 12 potters were registered in the third quarter of the 16th century (*Źródła dziejowe* 1911: 98–288). A similar role was also played by Gdańsk, where more than a dozen ceramic craftsmen were active at the time. Given the population size of the

whole agglomeration, it is probable that the local products found buyers locally. The only exception would be stove tiles, which were exported to other towns throughout the Commonwealth (Pospieszna 2009).

The above conclusions are still within the realm of research hypotheses. This applies equally to the structure of the changes, the characterisation of particular consumer attitudes, and the attempts at identification of local pottery-making centres undertaken by archaeologists. Thus, there is a clear need for further studies in regard to the transformation of the potter's craft in this part of early-modern Poland.

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Post-medieval Pottery in Mazovia and Podlachia (16th–18th Century) – a Preliminary Report

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The text is dedicated to the question of traditions and innovations in post-medieval pottery manufactured and used in the territory of today's Mazovia and Podlachia in Poland. It focuses on the distribution of waregroups in the assemblages from selected sites dated to the mid-16th – late 18th centuries. The list includes both capital cities in the province (Warsaw, Płock) and local towns (Ciechanów, Płońsk, Przasnysz), as well as royal and aristocratic residences, gentry manors and villages. Among the most characteristic features worthy of note are the long lasting of early medieval manufacturing traditions, the widespreaduse of greyware, the relatively small proportion of whiteware and glazed vessels, as well as the sporadic (excluding Warsaw) occurrence of fineware (porcelain, faience). The analysis points to the specificity of Mazovian pottery in 16th–18th centuries, in relation to both other Polish lands and our notions on trends in pottery manufacture and use in the post-medieval period.

KEY-WORDS: pottery, post-medieval period, Mazovia, Podlachia, ware groups

The post-medieval period can be considered as transition between the Middle Ages and modernity, a process spreading over several centuries. The clash between the "old" and "new", the confrontation of traditional normative discourses with the dynamic, sometimes violent, emergence of new political, economic, and socio-cultural relations is among the key features of the years between the discovery of America and the French Revolution. The extensive mobility of both people and commodities, triggered by the great geographical opening, fostered the creation of global economic networks, the emancipation of new social classes and the transfer of new or exotic cultural models (see, e.g., McCants 2007; Gerritsen 2016, with further literature). All these processes are reflected in the material relics of social life, including ceramic vessels.

Several factors deserve particular attention when considering the tension between traditions and innovations in pottery manufacture and use. Technological progress,

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embodied by the European discovery of porcelain recipes, is among the pivotal ones. The gradual decline of medieval institutions that regulated both pottery manufacture and distribution, namely, the guild system, is also of significant importance. One should pay particular attention to the increasing mobility that stemmed from the colonization of newly discovered lands, urbanization, and development of long-distance trade. This triggered the emergence of new patterns of social life, including modes of consumption, compatible with the ambitions and needs of new privileged social classes. The aforementioned questions, particularly changes in consumption patterns and table culture, are present in academic discourse, although the researchers' interest has focussed mainly on the core areas of the post-medieval Western world (see, e.g., Deetz 1977; Cassidy-Geiger 2007; Majewski and Schiffer 2009; Berg *et al.*, 2015, with further literature). Thus, an attempt to look at the socio-cultural transformations on the European peripheries through the lens of pottery finds appears to have significant cognitive potential.

The following text focuses on the "old" and "new" phenomena in post-medieval pottery production and use in the territory of today's Mazovia and Podlachia. The choice is not accidental – both territories had a peripheral character at that time, with the weakest impact of urbanization. We should, therefore, expect a relatively long duration of traditional ways of manufacture, along with the slow dissemination of innovations. It must be, however, stressed that since the mid-16th century, Mazovia and Podlachia were actively involved in the large-scale grain trade, essential for the economic prosperity of the entire country. Mazovia was also the location of the capital of the Polish-Lithuanian Commonwealth, Warsaw. The role of this city as the capital, together with the participation of Mazovian towns in the grain trade could have created favourable conditions for the adaptation and dissemination of new technologies and stylistic patterns.

For a long time, not much interest was taken by archaeologists of post-medieval pottery, and Mazovia has been no exception here, although it should be emphasized that the ceramic assemblages from the excavations of the Old Town and Royal Castle in Warsaw were among the first Polish publications of finds from the post-medieval period (see, e.g., Świechowska and Dukwicz 1955; Gierlach 1966; Janiszowski 1966). Excavations conducted over the last 30 years, related mainly to developments on both a supra-regional (the laying of the Yamal gas pipeline, the construction of motorways) and local scale (revitalization of town centres), have provided numerous and diverse groups of finds, regrettably, still largely unpublished (see: Bieńkowska and Kiziukiewicz 2006; Bis and Bis 2012; Pela 2013; Lis 2017, for further literature). Nevertheless, the data contained in publications and research reports allow us an overview of the ceramic material recovered from a selection of sites dated between the 16th and 18th centuries. The assemblages of potsherds obtained there provide the basis for a preliminary evaluation of post-medieval pottery in Mazovia and Podlachia.

Due to limitations of space, this paper will concentrate on the issue of the differing proportions of ware groups in chosen assemblages of the period discussed. Of key

importance is the question of the mutual relations between pottery groups recognized as "traditional" (brownware, greyware) and those that were "progressive" (glazed ware, whiteware, fineware). The majority of the assemblages selected have been the subject of studies conducted personally by the author, with the application of a uniform set of statistical methods introduced by Jerzy Kruppé (1967; see also Trzeciecki 2016: 37–46, for further literature). Other assemblages have been included that had been analyzed with the use of the aforementioned (or comparative) set of methods and published in a form allowing the raw data to be used here. The selection focused on providing the broadest possible representation of the basic site groups, namely, towns, palaces of the aristocracy, manors of the gentry, and villages (Fig. 1; Table 1). It is worth noting that all of the finds presented here have been acquired in the course of rescue excavations.

Data on pottery in use in Mazovian towns are provided by the assemblages from the excavations conducted in Warsaw as well as in other Mazovian towns: Płock, Ciechanów, Płońsk, Przasnysz, Bielsk Podlaski. It should be stressed that in the case of the majority of the towns discussed here, the selected assemblages provide only partial information, concerning specific places within the urban space. Only in the case of Płock, do we have at our disposal data that create the basis for studying changes in the manufacture and use of pottery in areas situated across the whole municipal complex. Vessels from royal and aristocratic seats are represented by assemblages from eighteenth-century Warsaw residences: the Branicki, Jabłonowski and Witosławski palaces, along with the pottery from the royal castle in Tykocin, the residence of the Sapieha family in Dubno, and the Branicki Palace in Białystok. Assemblages from manors of the gentry derive from Gaj Nowy, Niegów, and from a type of settlement structure specific to post-medieval Mazovia and Podlachia, namely, petty-gentry villages (Brulino-Koski, Zambrzyce Stare). There has been very little archaeological investigation of post-medieval peasant villages, particularly when compared to the amount of excavations in towns. Therefore, only assemblages from three villages located in the vicinity of Warsaw (Komorowo, Rusiec, and Strzeniówka) have been included, along with the pottery assemblage from the peasant village of Leonowicze in Podlachia.

Among the atavistic features of Mazovian pottery-making, worthy of particular attention are: the long duration of early medieval manufacture traditions, such as tempering clay with crushed stones, the use of a coiling technique, and the firing of the products in an uncontrolled oxidizing atmosphere. So-called "traditional" vessels occur in the assemblages from towns. In early sixteenth-century Płock, the quantity reaches 14.6%, to drop to almost 2% in the early 17th century. Interestingly, in Płock they occurred mainly in the castle and estates belonging to the nobility and clergymen that lived in the town but they were not involved in its social and economic structures (Trzeciecki 2016: 198 ff). The relatively low quantities of traditional vessels from both Warsaw (Castle Sq., up to 1%) and small towns that were founded around 1400 – Ciechanów (Market Sq., 2.4%), Płońsk (Zduńska St., 0.7%), and Przasnysz

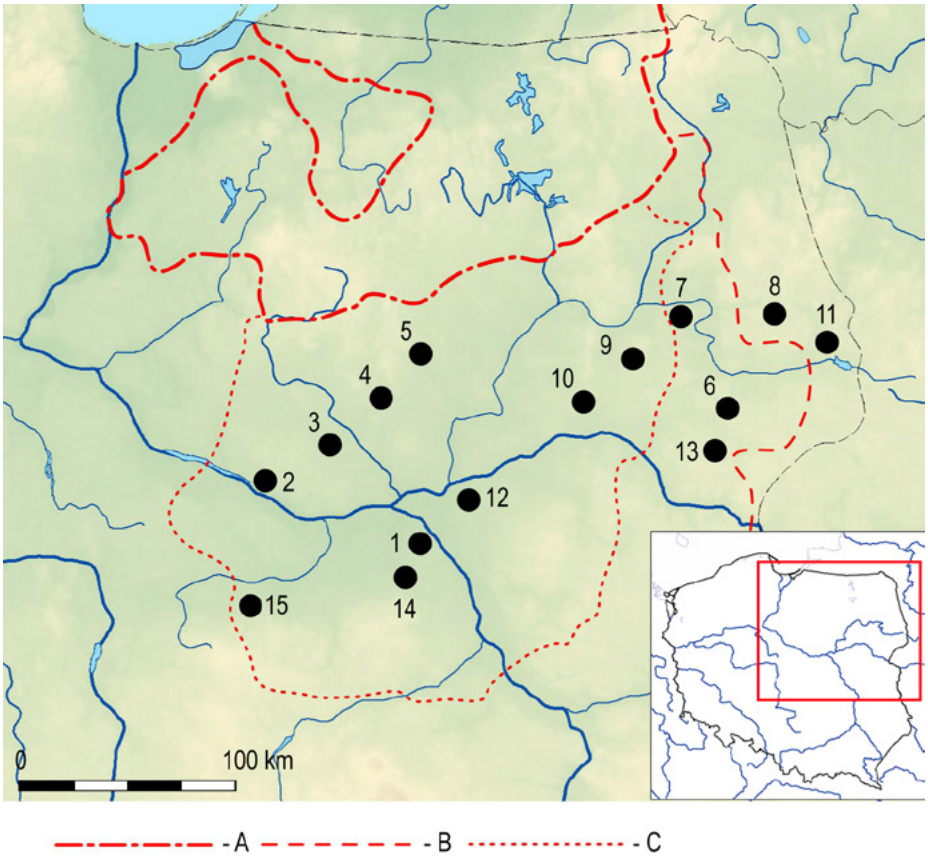

Fig. 1. Location of the archaeological sites mentioned in the text. A – frontier of the Polish-Lithuanian Commonwealth in the 16th–18th centuries, B – internal frontier between Poland and the Grand Duchy of Lithuania after 1569, C – Duchy of Mazovia in the 15th century. 1 – Warsaw, 2 – Płock, 3 – Płońsk, 4 – Ciechanów, 5 – Przasnysz, 6 – Bielsk Podlaski, 7 – Tykocin, 8 – Białystok, 9 – Zambrzyce Stare, 10 – Brulino-Koski, 11 – Leonowicze, 12 – Niegów, 13 – Dubno, 14 – Komorów, Rusiec, and Strzeniówka (villages in the vicinity of Warsaw), 15 – Gaj Nowy. The numbers correspond with Table 1.

(Czeladnicza St., 0.5%) point to the links between this group of ceramics and the rural hinterland. Traditional vessels finally disappeared from the Mazovian towns by the mid-17th century.

Early medieval pottery-making traditions lasted much longer in villages and manors. Clear regional differences should be stressed here – the quantity of traditional vessels grows significantly in the eastern part of the discussed territory, in the least

Table. 1. List of the sites mentioned in the text with chronology and literature references. Site numbers correspond with the map in Fig. 1.

	Site	Settlement type	Chronology	Literature
1a	Warsaw, Castle Sq.	town	16th – 18th c.	Trzeciecki 2017
1b	Warsaw, Browarna St.	town	18th c.	Trzeciecki and Rudnicki 2021
1c	Warsaw, Branicki palace	aristocracy residence	mid-17th – mid-18th c.	Trzeciecki 2020a
1d	Warsaw, Jabłonowski palace	aristocracy residence	17th – 19th c.	Starski 2013
1e	Warsaw, Witosławski palace	aristocracy residence	18th c.	Smoliński and Trzeciecki 2020
2	Płock	town	16th – 19th c.	Trzeciecki 2016
3	Płońsk, Zduńska St.	town	16th – 17th c.	Smoliński *et al.*, 2010
4	Ciechanów, Market Sq.	town	16th – early 18th c.	Trzeciecki and Affelski 2016
5	Przasnysz, Czeladnicza St.	town	16th – 18th c.	Smoliński and Trzeciecki 2010
6	Bielsk Podlaski	town	16th – 18th c.	Pawlata 2015
7	Tykocin	royal castle	16th – early 17th c.	Auch and Trzeciecki 2015
8	Białystok	aristocracy residence	18th c.	Pawlata 2013
9	Zambrzyce Stare	petty-gentry village	16th – early 17th c.	Trzeciecki and Affelski 2017
10	Brulino-Koski	petty-gentry village	16th c.	Musianowicz 1975
11	Leonowicze	peasant village	mid-16th – early 18th c.	Gołembnik *et al.*, 2018
12	Niegów	gentry manor	mid-17th – 18th c.	Trzeciecki 2017b
13	Dubno	aristocracy residence	17th – 18th c.	Garas and Karwowska 2013
14a	Komorów	peasant village	16th – 18th c.	Morysiński 2015
14b	Rusiec	peasant village	16th – 18th c.	Morysiński 2015
14c	Strzeniówka	peasant village	16th – 18th c.	Morysiński 2015
15	Gaj Nowy	gentry manor	16th – 17th c.	Świątkiewicz 1992

urbanized areas of the former medieval Polish-Ruthenian borderland. In the collections of pottery from sixteenth-century villages and manors in left-bank Mazovia, however, traditional vessels constitute a maximum of a few percent and disappear before the end of the century (Świątkiewicz 1992: 279–280; Morysiński 2005: 384–390, tables 2–9). Assemblages from eastern Mazovia provide entirely different proportions. The villages of Brulino-Koski and Zambrzyce Stare, established in the 16th century and inhabited by petty gentry, with the proportion of traditional vessels of 70–80%, can serve as a good example here (Musianowicz 1975: 150–151, table 1; Trzeciecki and Affelski 2017: 171–172). The quantities of traditional ware reach 44% in the sixteenth-century assemblage of kitchenware from the royal castle in Tykocin (Auch and Trzeciecki 2015: 191–192). The assemblage of vessels from Leonowicze, a peasant village in Podlachia established in the mid-16th century and abandoned in the early 18th century, included about 90% of the traditional ware (Gołembnik *et al.*, 2018: 335–336). Early medieval pottery-making techniques lasted in eastern Mazovia and Podlachia up to the early 18th century, as evidenced by the single finds of traditional vessels from the excavations held in the gentry manor in Niegów, and palaces of the aristocracy in Dubno and Białystok (Garas and Karwowska 2013: 228; Pawlata 2013: 131–132; Trzeciecki 2017b: 171, 185). Interesting regional differences are reflected also in the repertoire of forms – traditional vessels from western and northern Mazovia imitate greyware pots (Fig. 2:1–9), while in eastern Mazovia and Podlachia the influence of pottery styles of Black Rus', unchanged since the 12th century, predominate (Fig. 2:10–15; Auch and Trzeciecki 2015: 194–195).

Since the publication of the first – and so far the only – attempt to synthesize the transformations of post-medieval pottery in Poland (Gajewska 1993), a high percentage of vessels fired in a reducing atmosphere has been taken as an indicator of the impact of medieval traditions (e.g., Kajzer 1994; 1996: 216–218; Morysiński 2005: 412–413; Marcinkowski 2009: 211–212). In the case of Mazovia, however, the dissemination of greyware was of a different nature. This ware group appeared there relatively late, along with location of Płock and Warsaw in 1300. Up to the late 14th century, the manufacture and distribution of greywares was limited mainly to the aforementioned towns. The wider dissemination of greyware vessels was related to the urbanization of western and northern Mazovia that started around 1400. Up to the end of the 15th century, they constituted almost 100% of the pottery assemblages from towns. The percentages of greyware vessels began to decrease in the 16th century. The decline is most visible in the case of Warsaw (Castle Sq.) – from over 90% at the end of the 15th century to 17% in the late 16th century, and only 3.5% in the mid-18th century. The quantity of greyware in the assemblages from smaller towns, dated to the second half of the 16th century, is significantly higher – up to 60% in Płock, Ciechanów (Market Sq.), and Przasnysz (Czeladnicza St.). It reaches more than 80% in the collections of pottery from Płońsk (Zduńska St.) and Bielsk Podlaski. The percentage of greyware slowly decreased during the 18th century, below 22.5% in Płock and 38% in Przasnysz

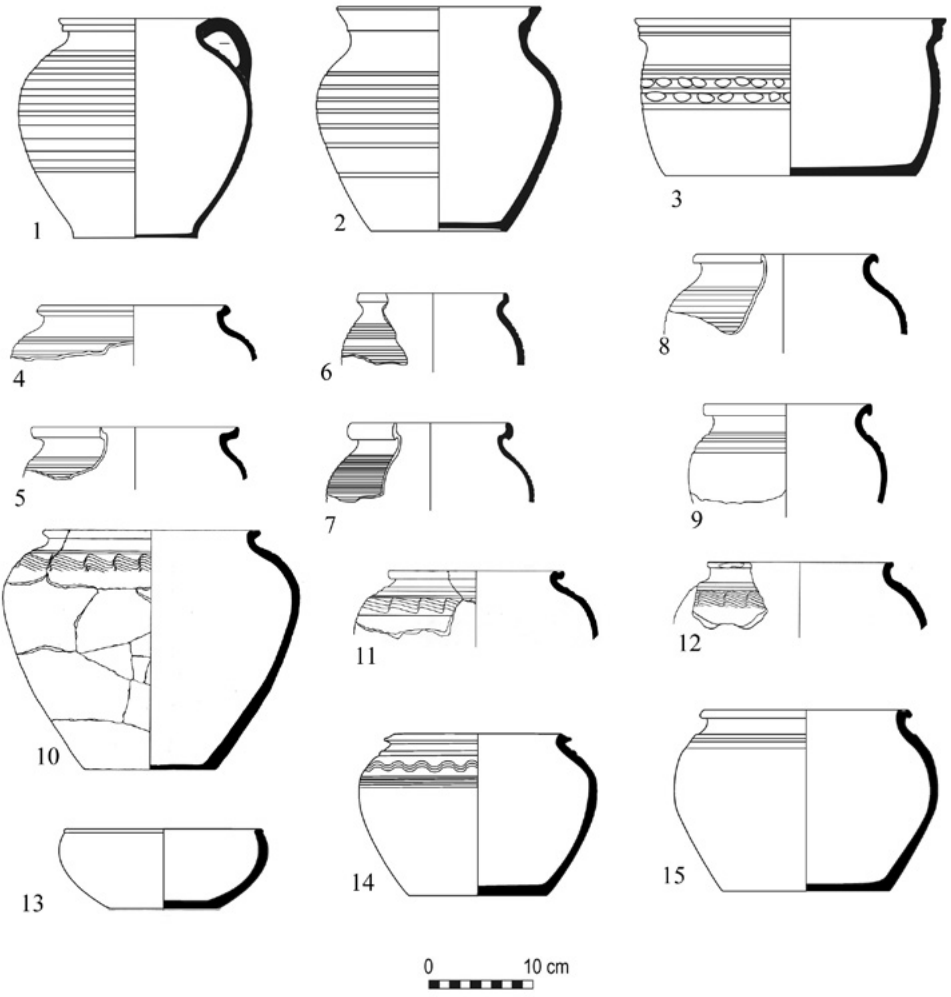

Fig. 2. Selection of traditional vessels from the second half of the 16th century to the mid-17th century: Płock (1–3), Warsaw, Castle Sq. (4, 5), Niegów (6, 7), Zambrzyce Stare (8, 9), Tykocin (10–12), Leonowicze (13–15). 1–9, 13–15 drawn by M. Trzeciecki, 10–12 after Auch, Trzeciecki 2015.

(Czeladnicza St.). It should be however noted here that single greyware vessels are still present in the nineteenth-century pottery assemblages from Mazovian towns (Trzeciecki 2019: 154–160, with further literature).

The slow decline of greyware in Mazovian towns is accompanied by an equally slow increase of this group of wares in the hinterland. Interestingly, as in the case of

traditional pottery, the spread of vessels fired in a reducing atmosphere begins in western Mazovia and reaches the north-eastern outskirts of the region the latest. Greyware vessels, mostly jugs, appear in the villages in the vicinity of Warsaw already in the 15th century. In the late 17th century, their quantities reach 50% and then decline, mostly in favour of vessels fired in a highly oxidizing atmosphere (Morysiński 2005: table 4–9). The proportions of greyware vessels in the assemblages from the sixteenth-century petty gentry villages of eastern Mazovia are in the range of 10–20%. The percentage of such ware group in the royal castle of Tykocin was only slightly higher. In the village of Leonowicze in Podlachia, greyware comprises up to 5% of the assemblages. In the majority of cases, greyware was represented mostly by tableware – jugs, pitchers, and plates. In the late 17th and 18th centuries, the proportion of greyware, both kitchen and table vessels, in the assemblages from eastern Mazovia and Podlachia exceeds 50% (Niegów) or even 60% (Dubno, Białystok). It should be, however, mentioned here that the real mass spread of greyware in Podlachia started only at the turn of the 18th and 19th centuries, and their production is continued there up to the present time (Trzeciecki 2019: 159–160, with further literature).

Post-medieval Mazovian greyware vessels are highly differentiated in terms of their stylistic features. Among the most characteristic groups, highly decorated polished tableware, mostly jugs and pitchers, manufactured in the 16th and early 17th centuries, should be mentioned first. They were produced in the majority of Mazovian towns, among them vessels from Płock (Fig. 3:1–5) and Płońsk (Fig. 3:6–8) deserve particular attention, primarily due to their individual and creative stylistic inventions. In the 17th and 18th centuries, the forms of greyware vessels became standardized, repeating the stylistic features of the whiteware pots. Burnished decoration still distinguishes the greywares, although the motifs became simplified (Fig. 3:9–13).

Glazed vessels fired in a controlled, highly oxidising atmosphere and described as "red-" or "whiteware", regarding the type of clay, are among the pivotal indicators of the post-medieval period. Although both of the groups appear in the pottery assemblages from Mazovia, their detailed characteristics depart from the general picture of post-medieval pottery in the Polish lands. First and foremost, the surprisingly low percentage of glazed vessels deserves particular attention. Although the quantity of glazed ware in the assemblages from Warsaw ranges from 35–45% in the second half of the 16th century, up to 55–80% in the second half of the 18th century (Starski 2013: table 2, 3; Trzeciecki 2017a: table 93, 94; 2020a; Smoliński and Trzeciecki 2020; Rudnicki and Trzeciecki 2021), data from the other Mazovian towns reveal a completely different picture. The percentage of glazed ware in Płock gradually increases from 3% in the second half of the 16th century, up to 7% in the second half of the 18th century (Trzeciecki 2016: table 3, 5, 39, 61). Their quantity in Przasnysz (Czeladnicza St.) is equally low, from less than 1% in the 16th century up to 5% in the 18th century. In Ciechanów (Market Sq.), in the assemblages dated to the late 16th and 17th centuries,

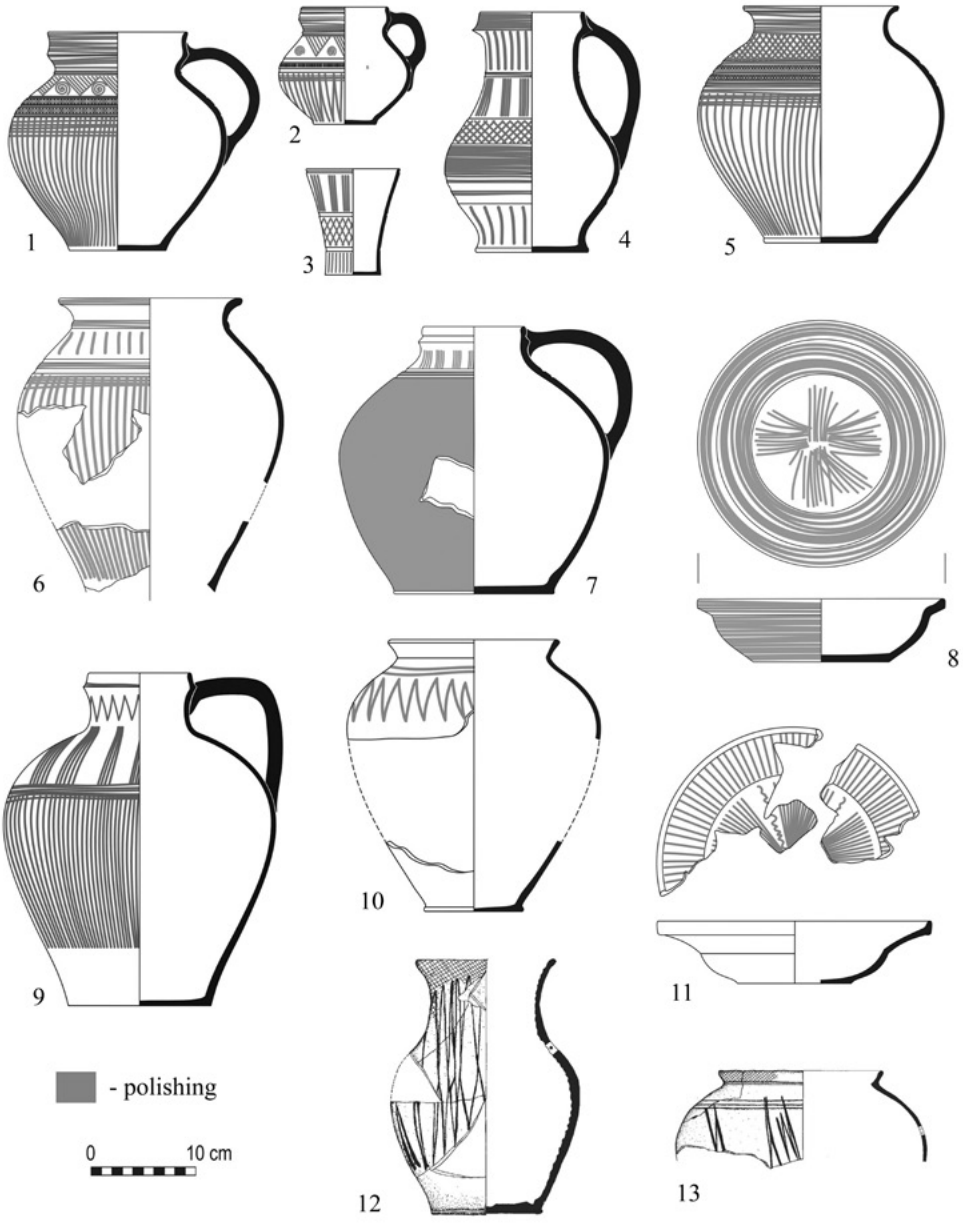

Fig. 3. Selection of greyware vessels with burnished decoration from the second half of the 16th century (1–7), mid-17th – mid-18th century (8–12): Płock (1–5, 9), Płońsk, Zduńska St. (6–8), Niegów (10, 11), Dubno (12, 13). 1–11 drawn by M. Trzeciecki, 12–13 after Garas and Karwowska 2013.

glazed wares comprise only 9%, while in Płońsk (Zduńska St.) their quantity reaches only 2% (Smoliński *et al.*, 2009; Smoliński and Trzeciecki 2010; Trzeciecki and Affelski 2016: 174).

Glazed vessels appeared in the rural hinterland of Warsaw already in the 16th century, with the proportion reaching 3%. In the late 17th century, they comprise about 50% of the entire assemblage (Morysiński 2005: table 25–31). In the sixteenth-century villages of eastern Mazovia and Podlachia, glazed wares occur sporadically, as evidenced by the assemblages from Zambrzyce Stare and Leonowicze (Trzeciecki and Affelski 2017: 182–186; Gołembnik *et al.*, 2018: 337). Their percentage rises gradually from the mid-17th century. In the assemblages from both the manor in Niegów and the palace in Dubno, it reaches 6% (Garas and Karwowska 2013: 234–235; Trzeciecki 2017b, 172–174, Table 1). Glazed red- and whiteware vessels comprise approximately 14% of the pottery collection from the palace in Białystok, dated to the 18th century (Pawlata 2013: 135–136, table 1).

The spread of white pottery (i.e., kitchen and table vessels manufactured of low ferrous clays and fired in highly oxidizing atmosphere) in Mazovia also has a specific character. Their proportions in the assemblages discussed here are, in general, low. The only exceptions, although each for different reasons, are Warsaw and Płock. In the latter, whiteware vessels were manufactured from the early 14th century up to the early 19th century, thanks to the easy access to the local sources of suitable clays. It is thus hardly surprising that in the mid-16th century, the proportion of whiteware in Płock was equal to 21%, while in the mid-18th century it reached 61% (Trzeciecki 2016: table 3, 5). Interestingly, the Płock whiteware vessels appear to be extremely resistant to the stylistic changes taking place during the period in question – the S-shaped, unglazed, red-painted white pot, introduced in the early 14th century, remained the most common vessel type up to the end of the 18th century (Fig. 4:1–6).

Presumably, the majority of the whiteware pots found in the post-medieval Mazovian sites were manufactured in the pottery production centres located in the Holy Cross [Świętokrzyskie] Mountains region. Vessels produced there were distributed on a mass scale to the majority of towns in the middle Vistula basin since the early 16th century. Their formal stylistic features had a strong impact on locally produced grey- and redware pots (Bis 2014: 53–64, with further literature).

Whiteware pots from the Holy Cross Mountains region appeared in Warsaw relatively early, at the end of the 15th century. In the collections from the selected sites dated to the second half of the 16th century, their percentage reached 40% and increased to 60–80% at the end of the 18th century (Trzeciecki 2017a: table 93, 94; Smoliński and Trzeciecki 2020; Rudnicki and Trzeciecki 2021). The percentages of whiteware in the assemblages from other Mazovian towns are surprisingly low. In Ciechanów (Market Sq.), they comprise 3% of the collection. Such values are even lower for the pottery assemblages from Przasnysz (Czeladnicza St., 0.9%) and Płońsk

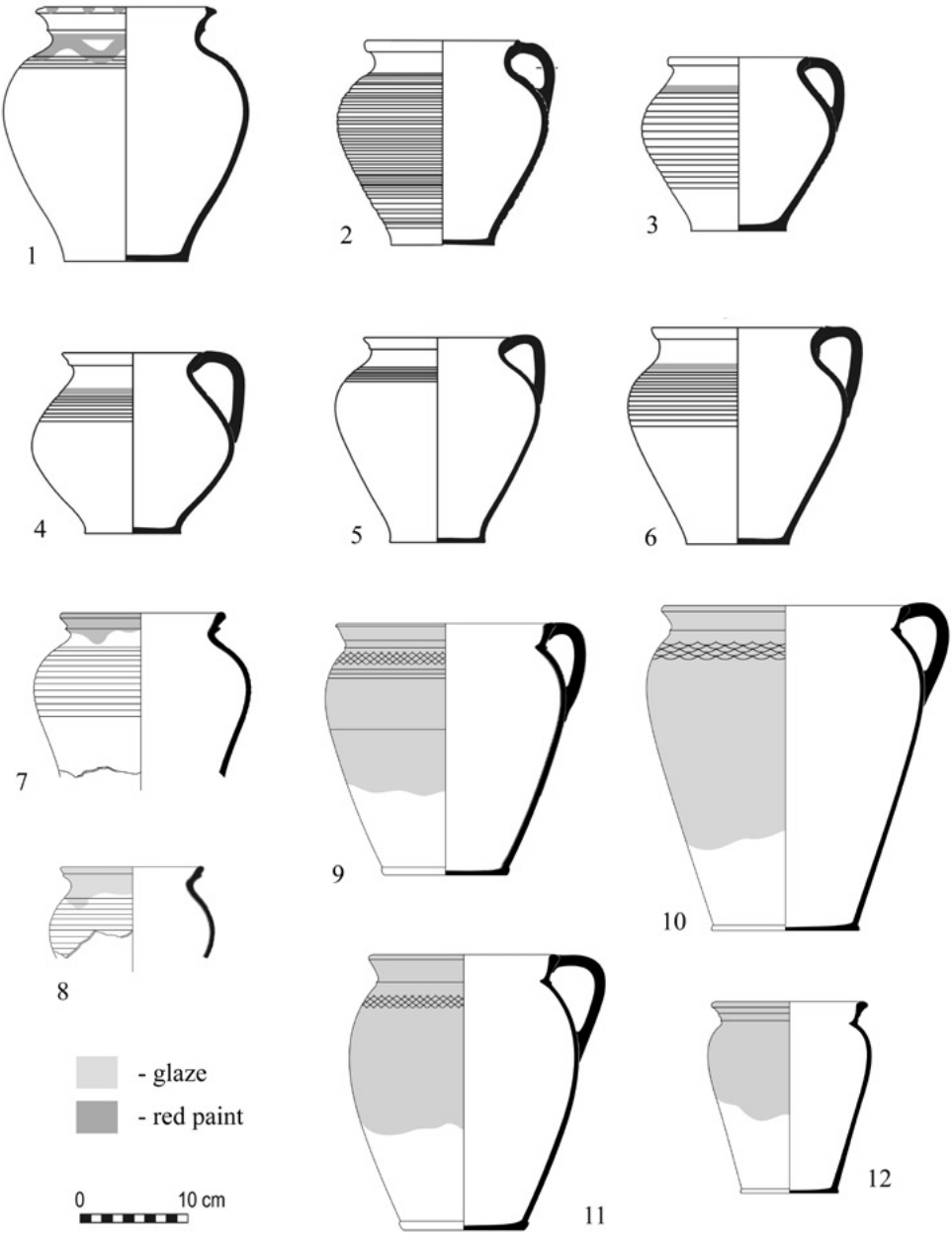

Fig. 4. Selection of whiteware vessels from the second half of the 16th century (1–3, 7, 8), mid-17th to mid-18th centuries (4–6, 9–12): Płock (1–6), Warsaw, Castle Sq. (7–12). Drawn by M. Trzeciecki.

(Zduńska St., 0.7%). Although the discussed assemblages are dated to the 16th – mid-17th centuries, we can assume that the increase of the whiteware in the following period was not significant – their percentage in the assemblages from Przasnysz (Czeladnicza St.), dated to the late 17th – early 18th centuries, reaches only 3% (Smoliński *et al.*, 2009; Smoliński and Trzeciecki 2010; Trzeciecki and Affelski 2016: 174–176). Data on the assemblages from the Mazovian hinterland also indicate a relatively late inflow of whiteware. These vessels appeared in the second half of the 17th century, mostly in the villages located in the neighbourhood of Warsaw, in quantities of about 2–3%. In the late 18th century, they comprise almost 80% of the assemblages (Morysiński 2005: table 12–14). Percentages of whiteware vessels in the pottery collections from manors and palaces of eastern Mazovia and Podlachia in the late 17th and 18th centuries are markedly low (Niegów – 4%, Dubno – 6–8% , Białystok – 12–14%; Garas and Karwowska 2013: 231–234; Pawlata 2013: 134–135, Table 1; Trzeciecki 2017b: 171).

Whiteware pots from both Warsaw and other Mazovian towns (with the exception of Płock) share the same stylistic features. Glazed, egg-shaped pots with the rims strongly drawn upwards, decorated by rouletting, often with a motif of so-called "fish scales", dominate the entire group (Fig. 4:9–12). Such a stylistic pattern is widespread in the majority of towns receiving whiteware vessels imported from the Holy Cross Mountains region pottery-making centre in the late 17th and 18th centuries (see, e.g., Oniszczuk 2013: 85–88, for further literature).

The dissemination of vessels strongly associated with the changes in the table culture between the 16th and 19th centuries – slipware, faience, and porcelain – deserves particular attention (Fig. 5). It is noteworthy that faience and porcelain can hardly be found in the majority of pottery assemblages discussed here. Tableware of both porcelain and faience appears in eighteenth-century Warsaw, and comprises between 3 and 18% of examined assemblages (Trzeciecki 2020b; see also Więcek 2012; 2017; Klarecki 2012). A relatively large collection of such vessels have been recovered in Tykocin (Bis and Bis 2013), smaller amounts of faience and porcelain occurred in the assemblages from palaces in Białystok (Pawlata 2013: 136–138) and Dubno (Garas and Karwowska 2013: 236–238).

On the contrary, glazed slipware (also known as "underglaze painted vessels") appear in the pottery assemblages from the majority of sites, excluding peasant villages. The question of their stylistic features and distribution is best represented by the finds from Warsaw (see: Meyza 1991; 1996; 2017, with further literature). Thus, it is sufficient only to mention that slipware appeared in Warsaw before the mid-16th century, and its frequency grows in the following century, up to 20% of the average assemblage. In Płock, the first slipware plates are present in the pottery assemblages date to the second half of the 16th century (0.06%). In late 18th century assemblages, their proportion rises to 1.9% (Trzeciecki 2016: table 3, 4). The percentage of the slipware vessels is similar in seventeenth-century Ciechanów (Market Sq., 1.5%). In the other

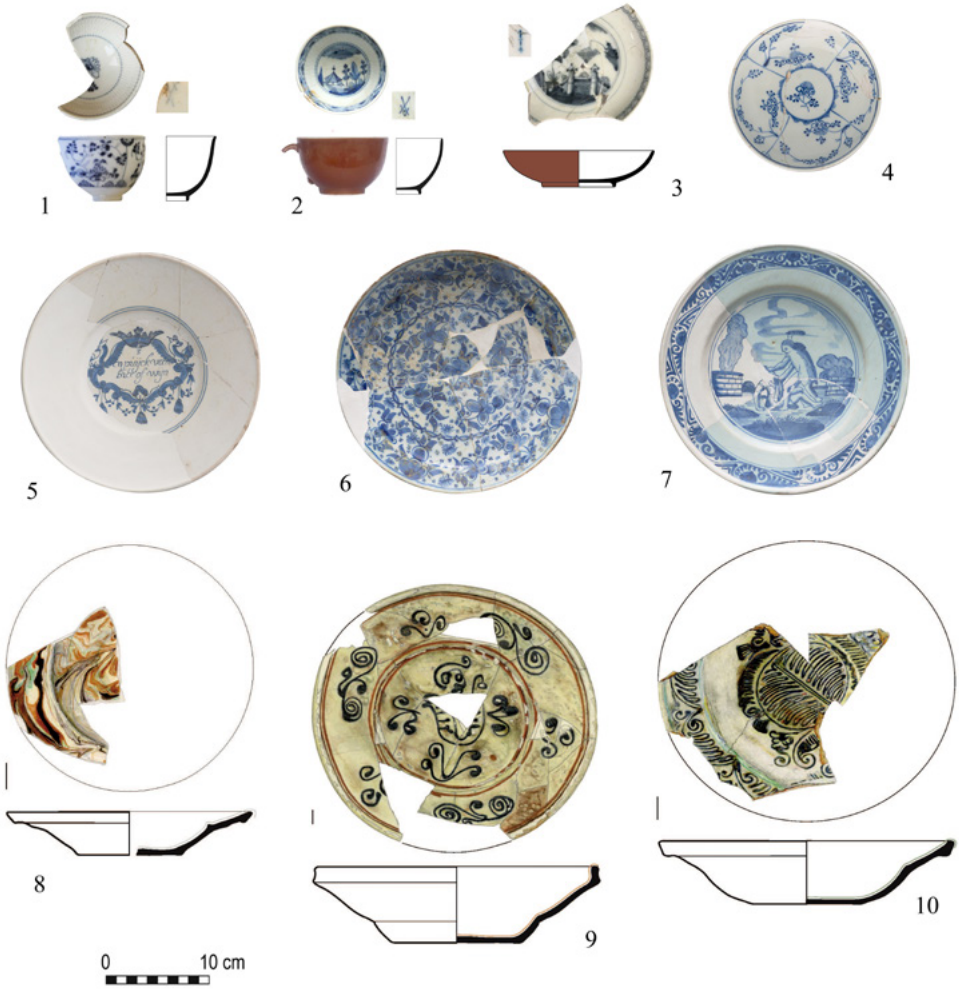

Fig. 5. Selection of eighteenth-century porcelain (1–4), faience (5–7), and slipware vessels (8–10) from Warsaw: Witosławski Palace (1–3), Castle Sq. (4–10). Photo: 1–3 – M. Trzeciecki, 4–7 after Więcek 2017, 8–10 after Meyza 2017.

towns mentioned here – Przasnysz (Czeladnicza St.) and Płońsk (Zduńska, St.) – the proportions do not even reach 1% (Smoliński *et al.*, 2009; Smoliński and Trzeciecki 2010; Trzeciecki and Affelski 2016: 176). Equally low is the percentage of the slipware in the assemblage from Niegów (Trzeciecki 2017b: 171). Slightly more numerous sets of

underglaze painted vessels were recovered from Dubno and Białystok, although their quantities do not exceed 4% (Garas and Karwowska 2013: 238–240; Pawlata 2013: 136).

To sum up this brief review of the significant stylistic features of post-medieval pottery from Mazovia and Podlachia, both the traditional and innovative elements specific to the territory discussed here are worth considering again. The relatively long duration of early medieval pottery-making techniques, in the eastern part of the region continuing at least to the early 18th century, is an undoubtedly archaic feature. It is noteworthy that the manufacture of traditional ware appears to be strongly connected with the hinterland. The mass-scale production and use of greyware, the most typical feature of Mazovian post-medieval pottery, can hardly be regarded as traditional; vessels fired in the reducing atmosphere entered Mazovia already at the end of the Middle Ages. Their relatively high proportion in assemblages in the sixteenth-century Mazovian towns and their gradual spread into the hinterland can be regarded as a side effect of the late urbanization of the territory in question. It should be also emphasized here that sixteenth-century "urban" greyware vessels bear at least one feature typical of the post-medieval modes of manufacture, namely, the individual invention of artisans in adopting or creating new forms and decorative patterns (see Trzeciecki 2016: 205–211; 2019: 159–160, for further literature).

A negligible proportion of other fabric groups, considered as "type-fossils" of the post-medieval period, especially glazed red- and whiteware vessels, appears to be related to the widespread use of greyware. Glazed whiteware pots frequently occur only in Warsaw and its vicinity in the 17th–18th centuries. Płock, with its own exceptionally conservative tradition of white kitchenware production, is a separate case. Undoubtedly, the stylistic features of the whiteware pots from the Holy Cross Mountains region had a very strong impact on the forms of grey- and redware vessels manufactured in Mazovia in the second half of the 17th and the 18th centuries. The relatively small percentages of fine ware can be regarded as a sign of the strength of tradition. It seems, however, rather more probable that it documents the economic barriers limiting access to luxury goods to the narrow circle of the state's elites and the townspeople of Warsaw. It should be also stressed here that the low percentage of faience and porcelain is typical for the entire extent of the Polish lands, where larger eighteenth-century collections of fine ware occur only in a few of the biggest cities of the Polish-Lithuanian state, first and foremost in Gdańsk.

The remarks on post-medieval pottery from selected sites of Mazovia and Podlachia presented here raise questions about the interactions between the "old" and "new" in the pottery-making techniques and stylistic choices. The answers are not unambiguous. They rather highlight the multidimensionality of the past realities, the material traces of which are the vessel fragments that we excavate and study.

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Slipware from Tykocin Castle (Poland) from the 16th–18th Century

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The main goal of this article is to analyse post-medieval slipware found during archaeological excavations in Tykocin Castle and to describe its distinguishing features: decorative characteristics and forms. Further considerations are aimed at reconstructing the functions of the Tykocin slipware vessels in the castle household throughout the 16th to 18th centuries and attempting to determine their provenance. The analysis is preceded by the list of terminological problems pertaining to this pottery group in the Polish literature as well as elementary information on its production centres in Poland against the European background.

KEYWORDS: slipware, slip-decorated earthenware, lead-glazed redware, post-medieval pottery, semi-majolica, Tykocin Castle

INTRODUCTION

Pottery studies constitute an integral and constant aspect of archaeological research, since pottery is one of the most elementary archaeological sources, usually well-preserved and often found in large quantities, shedding light on everyday life in the past. Generally this holds true for the post-medieval period and the developments in pottery-making on the European continent that occurred throughout the 16th–18th centuries, which were predominantly manifested in the introduction of innovations unknown in the late Middle Ages: an extended assortment of forms and the differentiation of types of the produced vessels. This process mostly entailed the emergence and the gradual spread of luxury ceramics (such as majolica, faience, or porcelain) and more ordinary items (including glazed-ware, whiteware, or slipware) that complemented the "traditional" pottery (redware and greyware). These novelties also included personal and specialist utensils (such as plates, cups, kettles, or vases).

This diversity is also reflected in the assemblage obtained from the castle site in Tykocin, situated in Podlachia, north-eastern Poland. It comprises finds collected

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during archaeological excavations conducted there in the years 1961–1963 and 1999–2007 (for more information on the scope and results of these works, see Bis and Bis 2006; 2015a). Pottery clearly dominates the rich collection of artefacts discovered at that site, amounting to 65,871 pieces or 72% of the total number of artefacts. The majority are vessels of various types – 50,469 fragments, i.e., 76.6% of the ceramics and 55% of the whole assemblage from the site (see Bis 2015: 96–97, Table 2). Only a few of them – 137 fragments, merely 0.2% of total pottery – comprise sherds of the slipware discussed in this article (75 vessels in total). They are made of ferrous clays (redware), fired in an oxidising atmosphere, and decorated with painted ornaments of different complexity and techniques. For this purpose a slip (diluted clay) was used, creating an underlay for ornamentation and serving as a paint for the patterns. The decorated surface was covered with lead glaze. These vessels were used by the residents of Tykocin Castle in the modern era and after destruction were deposited at the site in cultural layers dated to the period between the second half of the 16th and second half of the 18th centuries.

The aim of this article is to draw attention to this small but distinctive pottery group and contribute to the Polish archaeological discourse on its production in what is contemporary Poland as well as the related terminological questions in the context of the European background. The main part of the text offers a characterisation of the finds from Tykocin Castle in regard to their morphology, function, and decoration, to the extent allowed by their state of preservation. These observations then serve as a basis for a discussion on the functions of these vessels in Tykocin Castle throughout the 16th–18th centuries. An attempt has also been made to determine their provenance.

TERMINOLOGY AND RECENT FINDS

Foreign literature uses several related terms connected to the pottery discussed here. In the English nomenclature, they are usually referred to as slip-decorated lead-glazed earthenware, redware with slip decoration, or, simply, as slipware, whereas the ornamentation itself is called slip trailing, slip-trailed decoration, or slipped decoration. German works tend to use *Malhornware* or *bleiglasierte Irdenware* (cf., Stephan 1987; Gaimster 2006). These terms are commonly accepted and used by foreign scholars in regard to this type of pottery. The above state of affairs, just as the whole development in research on these matters in Europe, is largely a consequence of the seminal study by Hans-Georg Stephan, published 34 years ago and monumental in its chronological-geographical scope (Stephan 1987; this work also lists older literature). Stephan's legacy has been continued (for more on the studies on slipware in Europe, as well as general remarks on subsequent publications and discoveries, see e.g., Stephan 1991; Gaimster 1991; 2009: 534–535).

Although in foreign publications these issues are settled, in Polish archaeological papers there is still a lack of consistency in the naming of the pottery examined here. Several terms are used,[1] often interchangeably. The most long-standing and commonly used and established among them are: semi-majolica (Polish: *półmajolika*; in studies over the past decade, e.g., Mackiewicz 2012: 152–154; Miazga *et al.*, 2012: 49; Garas and Karwowska 2013: 238–240; Poklewska-Kozieł 2013: 113–117, tabl. 12–14; Kruppé and Milewska 2014: 86–87; Affelski and Trzeciecki 2016: 173–174; Pankiewicz and Rodak 2016: 351–352; Trzeciecki 2016: 41–42, 129–130; 2017: 171–183; Wojenka 2016: 232–240; Rodak 2017: 162–163; Włoszek 2017: 105–106; Paterczyk 2018: 82–87; Meyza 2019: 69; Niedźwiadek 2019: 249; Zamelska-Monczak 2020: 155) and pseudo-majolica (Polish: *pseudomajolika*; in more recent works, e.g., Garas and Trzciński 2010: 27–28; Oniszczuk 2013a: 26; Pawlata 2013: 136; Starski 2013: 167–170; 2015: 119; Dryja 2014: 132; Gajewska and Kruppé 2017: 127–129; Lis 2017: 347–350; Trąbska *et al.*, 2019).

Other names have been proposed by researchers, but are far less popular. These include: lead-glazed earthenware with underglaze decoration (Polish: *ceramika zdobiona podszkliwnie*; mostly in Meyza 1991; 1993; 2017a; also Marcinkowski 2009; 2019: 93–95), and engobed earthenware with underglaze decoration (*angobowana zdobiona podszkliwnie*, as in Pytlak 2013: 69–71), painted red ware (Polish: *ceglasta malowana*), white-washed and glazed redware (Polish: *ceglasta szkliwiona na angobie*), slipped earthenware (Polish: *naczynia ceglaste malowane na angobie*), (see Lechowicz 2012: 118–119; Dąbal 2015: 232–236; 2018: 316–317; Dąbal and Szczepanowska 2018: 181, 185; Wołyńska 2020: 110–113), as well as decorated with a piping bag (*zdobione rożkiem*, see Mackiewicz 2012: 131), redware painted with a piping bag and glazed (Polish: *ceglaste malowane rożkiem i szkliwione*, e.g., Majewski 2017:95), as well as red ware engraved, painted with a piping bag cone and glazed (Polish: *ceglaste szkliwione rytowane i malowane rożkiem*, e.g., Kwiatkowski and Majewski 2016: 154, 181–183, Fig. 4–6; Majewski and Wojciechowska 2019: 79–82), or polychrome pottery (*ceramika polichromowana*, see Szwed 2004: 342–343). In some cases, the name mezzamajolica is also used (*mezzamajolika*, in newer works, e.g., Garas and Trzciński 2010: 27; Mackiewicz 2012: 152; Poklewska-Kozieł 2013: 113; Pankiewicz and Rodak 2016: 351; Paterczyk 2018: 82).

The majority of these terms are imprecise, as they were arbitrarily chosen to refer to several groups of pottery differing in terms of manufacturing technique but sharing similar painted decorations under lead glaze (Meyza 1991: 118–119; 1997: 125–127; see also Marcinkowski 2009; 2011: 15–16). Although they are still subject to debate, some of these terms have already become established in the Polish literature and are used to

[1] Due to the short form of the article, my aim is only to indicate the main terms used in the Polish literature with regard to this type of pottery. I will not analyze here the origins of these concepts, nor discuss publications in which they were used.

generally identify this type of vessels. These took place even though the prefixes used, such as "pseudo-" or "semi-", are value-laden and depreciate pottery called this way by comparing it to other types of presumably better quality – majolica or faïence – or suggesting that they are their imitations or forgeries. On the other hand, "lead-glazed earthenware with under glaze decoration" may just as well refer to vessels decorated this way but of a different type – the so-called Pomeranian faïence.

It seems that the most adequate term in the Polish language would an expression reflecting two primary features of these artefacts, i.e., the raw material and ornamentation – Polish: *ceramika ceglasta angobowana szkliwiona* [lead-glazed redware with slip decoration]. In my opinion, it is worth considering using the simplest, common English term – slipware. Both of these definitions (slipware and *ceramika ceglasta angobowana szkliwiona*) are broad enough to include slip-decorated vessels, where the slip differs in terms of methods of application and consistency. These are earthenware vessels with slip of thicker consistencies, which could be trailed, poured, or squeezed, or of thinner consistencies, which could be applied with a brush, a rag, or by hand. A design could also be cut through the overlying slip, exposing the contrasting colour of the clay body beneath (sgraffito decoration; see MPRG 1998: chapter 12.5–12.6; Orton and Hughes 2013: 86–88). I use this extensive meaning as the definition of the group of vessels discussed.

The unfading scholarly interest in this pottery is a European trend (the newer foreign publications are Amato *et al.*, 2009; Funke and Leiber 2012; Gawronski 2012; Kröll 2012; Witte 2014; 2016; Demuth 2015; Bikić 2017; Gajić-Kvaščeva *et al.*, 2018; Blažková 2019; Giorgio 2019; Heege 2019a; 2019b; Matějková 2019; Ose 2019: 72–74, 117–119; the works list further literature). On the one hand, it is related to the ongoing development of historical archaeology and studies of post-medieval pottery, including the expanding knowledge of slipware. On the other, it reflects the considerable frequency of these artefacts and their spread across the continent throughout the 16th–18th centuries, as well as European developments in decorated pottery production inspired by the Renaissance.

As indicated by the above-mentioned examples, the last decade has seen an increase in the known source base related to this pottery in Poland as well as publications referring to it. Such vessels have been found in various regions at sites containing post-medieval archaeological material. The dating of the Polish finds falls into the period between the second half of the 16th century and the 18th century. They match the European manufacturing standards at that time, both in terms of ceramic forms and their decoration techniques.

PRODUCTION CENTRES

Some of the most important regions in Europe where slipware was manufactured were located in today's Germany, of which the best-known are Weserware and Werraware.

The period when these vessels were produced in larger quantity extended over several decades (1580–1620/1630 and 1568–1620, respectively) and ceased when the Thirty Years' War broke out. The basic assortment consisted of tableware supplemented with kitchenware. Weserware was manufactured between the rivers Weser and Leine, in Altenhagen, Brüninghausen, Dörpe, Höxter, and Völksen. The primary distinguishing features of these vessels were simple colour ornamentation, mostly geometric and floral motifs (including zigzag lines) on a bright overlay (thanks to the use of white slip), and flat bases. Werraware was manufactured in Hesse, in the following production centres: Eschwege, Grossalmerode, Hannoversch Münden, Heiligenstadt, Treffurt, Wanfried, and Witzenhausen. What distinguished these vessels was that many specimens had painted production dates and ornaments made predominantly in the sgraffito technique, usually bright figural motifs against a dark underlay (e.g., Stephan 1987: 85–110, 274–280; Gaimster 1988; 2006; Bartels 1999; Demuth 2001).

Both of the aforementioned groups were numerous and widely distributed (Stephan 1987: 85–110, 274–280; the work lists further literature). They also reached the coast of the Baltic Sea (including Poland), as evidenced by archaeological finds and their recent publications (e.g., Demuth 2001; 2015; Russow 2006; Niukkanen 2007; Dąbal 2013; Oniszczuk 2013a; 2013b; Russow and Haak 2018; Ose 2019; Linaa 2020). Weserware and Werraware seem to be foreign slipware the most often identified in Polish post-medieval ceramic assemblages (e.g., Szwed 2004: 343; Dąbal 2013; 2015: 232–233; Oniszczuk 2013b: 89–90, Nos 377–391; Kwiatkowski and Majewski 2016: 154).

Another significant continental region where slipware was manufactured was the Lower Rhineland, especially Coppengrave, Duingen, Duisburg, Hohenbuchen, and Wesel (e.g., Gaimster 1988; 2006). However, many other manufacturing sites in central and northern Europe have been identified (see Stephan 1987), for instance Lüneburg, Rostock, or Husum in northern Germany (e.g., Schäfer 2007; Kröll 2012; Witte 2014), Beauvais, Pas-de-Calais, Arras, or Douai in northern France (e.g., Gaimster 1991), Schüpbach in Switzerland (e.g., Heege 2019a: 96), centres in southern Denmark (e.g., Witte 2016), Stockholm in Sweden (e.g., Johansson 2007), as well as Beroun and Levín in Czechia (e.g., Blažková 2019; Matějková 2019).

In the territory of modern-day Poland, the considerable amounts of known slipware finds contrast with the scarcity of identified and published post-medieval pottery-making centres or at least potential production sites. According to my findings so far, there were at least about a dozen such sites, located in different parts of Poland (due to the limited size of this paper, they are only listed below). In this regard, the archaeological perspective remains clearly distinct from the findings made by ethnographers (cf., Fryś-Pietraszkowa 1970: 68–69, il. 259; this author included 59 *półmajolika production* centres that operated in the post-medieval period and are inactive nowadays).

The production centre that initiated Polish studies of this type of pottery in Poland, and which remains the best-researched so far, is situated in Miechocin, nowadays

a suburb of Tarnobrzeg in Lesser Poland (current Podkarpackie Voivodeship; Szarek-Waszkowska 1967; Szetela 1969a; Szetela 1969b; Szetela-Zauchowa 1994; see also the leaflet by Handerek 2006). Excavation work at this site uncovered remains of 12 workshops, along with finished products and post-production waste. These operated in different periods between the late 16th century and the end of the 18th century, and the heyday of that production centre is dated to the first half of the 17th century. The goods manufactured there were divided into several groups according to their chronology and ornamentation.

Other potential production sites in the region were at Rzeszów, Łańcut, and Jarosław, based on slipware finds and historical records concerning pottery workshops functioning there in the 16th and 17th centuries. However, no material remains of workshops manufacturing slipware have been discovered so far. The collected potsherds represented an assortment similar to that from Miechocin, except for slight differences in decorative motifs and colour schemes (cf., Kotula 1953; 1956; Supryn 1975; Czopek and Lubelczyk 1993: 25–27).

One more place where slipware was manufactured in the 16th–18th centuries may have been Lublin (currently in the Lublin Voivodeship) or its environs. The abundance of finds and their significant representation in pottery assemblages from different local sites (e.g., Niedźwiadek 2019: 249), especially in manor houses (often above 50%), seem to support the above assumption. Despite such a high frequency, no slipware-manufacturing workshops have been discovered so far (personal communication with Rafał Niedźwiadek, July 19 2021).

Nevertheless, excavations have provided undisputed physical evidence for slipware production in Cracow (currently in the Lesser Poland Voivodeship) in the second half of the 16th century (Dryja 2014: 131–132), as remains of a workshop were unearthed in the suburb of Garbary, in 11 Loretańska Street. These vessels were fired in kiln III, along with a wide repertoire of other products (stove tiles as well as ceramic details and building materials).

Another workshop that probably manufactured redware with slip-trailed decoration alongside stove tiles, was discovered in Greater Poland, in Garczary, a suburb of Śmigiel (Wyrwińska and Wyrwiński 2005). At this site, archaeologists recorded remains of two kilns that operated in the second half of the 17th century. Glazed redware vessels with slip decoration were deposited mostly around the kilns and in their backfills and were interpreted as unused specimens or production waste (Wyrwińska and Wyrwiński 2005: 304–305, 307, Fig. 8).

It is sometimes suggested in publications that a workshop or a complex of workshops manufacturing similar post-medieval pottery existed also on Wzgórze św. Wojciecha (St. Adalbert Hill) in Poznań (Greater Poland Voivodeship; e.g., Poklewska-Koziełł 2013: 117; Paterczyk 2018: 87). The workshop that was recorded at that site produced panel tiles, among other things, which were dated to about the middle of the 16th

century, as well as some unspecified vessels (Łaszkiewicz 1993). Until these finds are fully published, however, this information remains unconfirmed.

The slipware excavated in Brzeg, Silesia (current Opole Voivodeship), at a site located in 10–12 Dzierżonia Street, has been considered to be of local origin. These finds were semi-majolica plates with redware and cream-white bodies, dated to the late 16th and 17th centuries, and constituted only a small percentage of the ceramic finds. The operation of a dynamic post-medieval pottery production centre in the town is attested by other archaeological sources and written records (Rodak 2017: 149–166).

Vessels of this type were also manufactured in Mazovia, in Warsaw, in one of the two pottery kilns (upper one, marked as no. 1) located within the former moat of the Old Town. This facility was interpreted as the workshop of Master Jan Rosołowicz, active in the late 17th century (Świechowska and Dukwicz 1955: 154–157, tab. 15; see also Meyza 2017b: 189–190). Its production focused on redware vessels, stove tiles and clay tobacco pipe bowls (Polish: *lulki*). In a recent verification of the excavation results, the dating of the finds was changed to the first half of the 18th century (Meyza 2017b: 196).

Two more slipware production sites were found in the Zachodniopomorskie Voivodeship. Such manufacturing activity in Myślibórz (Soldin) is evidenced by a pottery kiln preserved with its entire load and numerous pits filled with potsherds and fragmented stove tiles (Kałagate and Kościukiewicz 2004; Szymczyk 2011; Majewski 2019: 208), located near the town walls, behind the Pyrzycka Gate. The workshop functioned between the late 16th and early 18th centuries. The vessels found there stand out through their rich decoration (including the use of the chattering technique) and diversity of forms.

Remains of two presumed pottery workshops that operated after the late 16th century were discovered in Recz (Reetz/Neumark), in the housing blocks adjoining the town walls. Admittedly, no traces of manufacturing facilities have been found there, but the local production is evidenced by pottery wasters – potsherds and fragmented stove tiles, as well as unfinished and defective products (Majewski 2010; 2016: 81–84; 2019: 208–209).

Based on the above-mentioned examples, we may assume that the slipware characterised by its average quality and schematic decorative motifs may have been manufactured in many other pottery production centres and workshops as a part of a wider range of pottery, along with plain earthenware.

MATERIALS AND METHODS

The vessels discussed in this study were discovered in Tykocin Castle. This is a fortified structure situated opposite the town of Tykocin, on an elevation in the flood plain of the Narew River. It existed in its elementary form – a quadrangular brick-built

building – between the third quarter of the 16th century and the second half of the 18th century. The castle, together with bastion-type fortifications, was built on the orders of King Sigismund II Augustus.[2] Probably before 1630, when Krzysztof Wiesiołowski served as the castle's *starost*, the building and its interiors were modernised, with the surrounding fortifications transformed into a large bastion-type stronghold. A siege in 1657, during the Polish-Swedish war, brought severe damage to two of the four wings of the castle. However, the remaining part of the complex was still in use, at least for the next several decades. The castle belonged to the king until 1661 and afterwards was taken over by private owners: Hetman Stephan Czarniecki followed by the Branicki family of the "Gryf" coat of arms (to 1771). The fate of the building was sealed when a fire consumed it in 1734, along with the furnishings. After this disastrous event, no further attempts at reconstruction were made and finally (in the late 1760s) what remained of the castle was dismantled. Thus, its regular functioning was decisively terminated. Throughout the 19th and early 20th centuries, the relics of the building continued to deteriorate (cf., Bis and Bis 2006; 2015b).

The functions of the building changed throughout the two centuries of its existence depending on its proprietary situation and geo-political conditions. Since the beginning, it was meant to act as an important defensive point in this part of the Polish-Lithuanian Commonwealth, a garrison, and an arsenal. In addition, it safeguarded the private belongings of the last of the dynasty of Jagiellons (until 1573). Even at the beginning of the 18th century, it was still an important strategic point occupied by various armies during the military conflicts taking place in the Podlachia region since the mid-17th century. It became the seat of the Tykocin *starosts* (after 1572) and burgraves (castle administrators), a workplace for its numerous staff (including craftsmen of various trades and local villagers tasked with different services), and a place for judicial activities. The complex was also important for the local economy, as it comprised a building for economic functions, a granary, a brewery, an inn, a coach house, stables, and ponds. The castle was visited by several Polish elective monarchs and their courts: Stephen Báthory, Sigismund III Vasa, Ladislaus IV Vasa, Augustus II the Strong, Stanislaus I Leszczyński. It also served as a temporary residence for its owners – the Branicki family – and hosted important national events as well as local gatherings. In the course of the two centuries of its functioning (from the 1550s to the end of the 1760s), the number of people residing and eating at the castle fluctuated and is currently difficult to determine with precision. The same is true for their social or material standing and the related differences in consumption patterns and demands (cf., Bis forthcoming).

[2] Here, I ignore the earlier stage – from the late 15th to the early 16th century – when the castle functioned as a wooden structure belonging to the Lithuanian family of the Gasztołds. No slipware was dated to this period.

The 1960s, when the castle was to be transformed into a permanent ruin, saw the first archaeological excavations and architectural studies at the site, conducted by Jerzy Kruppé. Towards the 1990s, further archaeological exploration was undertaken and continued until 2007 to enable planned reconstruction of the castle. The latter earthenworks were managed by Magdalena Bis and Wojciech Bis (for more details, e.g., about discoveries, stratigraphy, objects, and other finds, see Bis and Bis 2006; Bis 2015). This research encompassed the remains of castle buildings – their interior and the castle's direct vicinity – up to the line of the bastion fortifications. They focused on the western, south-western, and north-western parts of the complex (cf., Bis 2015: 80, Fig. 30).

All finds discussed in this paper were discovered during the above-mentioned excavations (in total, 137 slipware sherds coming from 75 vessels). Most finds (44 vessels, i.e., almost 59%) were found during the excavations carried out in the years 2001–2007, whereas the rest (31 specimens, i.e., 41% of the total vessels) in the course of work conducted between 1961 and 1963 (Fig. 1). It is noteworthy, because the earlier finds are predominantly loose, as they have been obtained from architectural trial trenches

Fig. 1. Outline of the foundations of Tykocin Castle with location of trenches (orange and blue colours) and watching briefs (purple colour) from the years 1961–1963 and 2001–2007. The trenches with the biggest amount of slipware vessels are shown in red. Prepared by W. Bis.

or regular excavations but with stratigraphic contexts that are currently difficult to reconstruct. Some of the vessels from the methodical excavations at the beginning of the 21st century were obtained from recently-mixed layers – transposed within the complex or forming backfills of the earlier trenches. In these cases (41% of the slipware in total), it was assumed that they came from the time of the brick-built castle, i.e., the second half of the 16th to the second half of the 18th century. Therefore, they have no bearing for the chronological diversity of the assemblage. The majority of the remaining, and well-dated, artefacts come from the cultural layers formed in the 17th and 18th century.

Their frequency in different parts of the complex was uneven. Slightly more vessels (16) were discovered near the northern bastille (trenches nos. VII, 20 and 21). It was an area where broken items or elements of castle equipment (e.g., stove-tiles) were discarded during cleaning works in different periods, e.g., after the Swedish Deluge (1655–1660).

The drawback of many of the discussed finds is their poor state of preservation – heavy fragmentation, the small size of the sherds, and surfaces damaged due to post-depositional factors. In effect, assessing their morphology and differences in particular elements is problematic, just as is inferring their decoration, including the types of depictions, their distribution and layout, and connection to the vessel tectonics. Only three vessels were completely or largely reconstructed: one plate and two bowls. The majority of the finds are parts of rims (31), bases (19), bodies (24), and a single handle.

They represent two main categories of vessel forms – closed wares and open wares (cf., MPRG 1998: chapter 1.3.3). They were: plates, bowls, pots, mugs, jugs, and a lid (Table 1).

Table 1. Types of slipware vessels from Tykocin Castle, the 16th–18th c.

Slipware				
Vessel form	**Sherd count (SC)**	**%**	**Minimum number of vessels (MNV)**	**%**
plate	51	37.2	29	38.7
bowl	52	37.9	21	28
pot	16	11.7	12	16
mug	10	7.4	6	8
jug	7	5.1	6	8
lid	1	0.7	1	1.3
Total	137	100	75	100

The open wares prevail in the assemblage – plates (29 specimens, 39% of all the vessels) and bowls (21 specimens, 28% of the total). Other items, less frequently noted, belong to the group of closed wares. The mugs and jugs survived in the worst condition; they were found as fragmented bodies, which complicates their stylistic-morphological characteristic. The surfaces of many of the discussed vessels (57%) are discoloured and damaged, with the covering glaze often chipped (47%). Hence, the current appearance of these artefacts differs significantly from the original.

In order to analyse the above-described pottery assemblage, I followed the main guidelines of the British Medieval Research Pottery Group for standard procedures related to medieval pottery (cf., MPRG 2016), also used for post-medieval pottery assemblages (e.g., Gaimster 2006). The quantification method was based on the identification of the minimum number of vessels (MNV), which determines the smallest number of vessels that could have produced the sherds found in the ground. The method involves examining all the sherds objectively and placing similar ones, which may have originated from the same vessel, together (Gaimster 2006: 48). All examinations were made by macroscopic method. The slipware was defined by a combination of fabric (colour, texture, surface treatment, and glaze), form, and decorative characteristics (Gaimster 2006: 52), as well as vessel size, method of manufacture, evidence of use, and state of preservation (MPRG 2016: 20–32). I used the glossary of forms and types after the MPRG 1998 (see also Bauer *et al.*, 1986; Orton and Hughes 2013). All the investigated morphological and technological features were noted and entered onto a matching questionnaire (in a database system). The information registered there serves as the foundation for the further conclusions presented below. Selected potsherds were drawn and photographed and prepared for the figures included in the text.

RESULTS – CHARACTERISTIC OF SLIPWARE

The slipware found at the castle site in Tykocin was of decent quality. The vessels were manufactured from the most common raw materials – ferrous clays – which were adequately prepared. The ceramic mass usually contained sand in the form of glassy grains of quartz (for 60% of the vessels), characterised by coarse and medium size of grain inclusions (0.5–1 mm and 0.25–0.5 mm; cf., Orton and Hughes 2013: 280–282). The ceramic mass of bowls typically contained more coarse-grained inclusions (for 52% of them), usually due to utilitarian purposes. Single glistering flakes of white mica were also noticed.

The analysed pottery was predominantly (70 vessels, i.e., 93%) thrown on a potter's wheel. Five slipware vessels were hand-made (i.e., 7% of the total). The firing was conducted in an oxidising atmosphere and usually well-managed, as evidenced by the homogeneous colour of the core (the section through the wall) in many of the vessels (51, i.e., 68%). However, this process occurred sub-optimally in a significant

number of pots and bowls (about 40% for each category), which resulted in bi- or trichromatic cores. Upon firing, the vessels' bodies turned different shades of red – from pink to light brown, with reddish-yellow (5YR6/6–7.5YR6/6 according to Munsell) and yellowish-red (5YR4/6–5/6) being the most common (44 earthenware, i.e., 59%), followed by light-red (2.5YR6/6–7/6) or red (2.5YR4/6–5/8), (Munsell 2000).

The walls of these vessels are usually 3 to 7 millimetres thick. The thickness is greater in the parts of the bodies closer to the bases, especially in bowls, and the smallest in the middle parts of bodies in pots and jugs. From the outside, the walls were carefully smoothed, so that no irregularities can be felt. The cores are usually compact and hard (cf., Orton and Hughes 2013: 277). The glaze covering the surfaces of all the vessels is made of lead oxide, colourless, and transparent. It forms a thin layer that got tarnished or chipped in about a half of the specimens, due to post-depositional conditions (Figs 2:9–11; 3:1–2, 6). Apart from its practical purpose, i.e., increasing the impermeability of the vessels, the glaze was also a decoration – it emphasised the colour of the body and its ornamentation and provided the pottery with gloss. The glazing was applied to the already slip-covered and decorated outer walls of pots, jugs, mugs, and lids, as well as the inner walls of plates and bowls. Plates and bowls were also glazed (only partially and not always) on the other, undecorated side, while pots, jugs, and mugs were usually glazed on both sides.

What distinguishes the discussed artefacts is their decoration – colours and patterns. Unfortunately, due to their heavy fragmentation, not much can be said about the arrangement of the ornament or its correlation to the shape of the vessel. In most cases, only small parts of the ornaments are visible. Their specific primary feature is the use of the slip, which is obtained through suspension of fine clay in water (this is present on 60 earthenware, i.e., 80%). In 75% of the discussed vessels, their surfaces had been covered with white slip. Upon firing, such a layer put on clay bodies and under colourless glaze resulted in a bright, beige or yellowish overlay (Figs 2–5). In the case of the remaining 25% of the earthenware, a brown or green slip was used, thus creating a dark cover, strengthening the natural colour of the raw material (Fig. 6).

Such prepared surfaces were then ornamented. Much less frequently (in 15 vessels, i.e., 20% of the total), the decoration was applied directly on the body. In more than 20% of the cases (i.e., 17), the state of preservation precluded identification of decorative motifs. The vast majority (62 vessels, i.e., 83%) were embellished with colourful painted patterns. Their assortment consists of several schematic groups:

1) floral, the most common (27 items, i.e., 36%) – in the form of stylised leaves, twigs, flowers, buds, and osiers arranged into, as it seems, diverse combinations (Figs 2:1–3, 10–13; 3:3–4, 9–10; 6:4);
2) geometrical, less common (12 items, i.e., 16%) – mostly straight or wavy lines in various arrangements (horizontal, vertical, and diagonal), strips, dots, and circles (Figs 2:5–9; 3:5, 7–8; 6:1–3, 5–8);

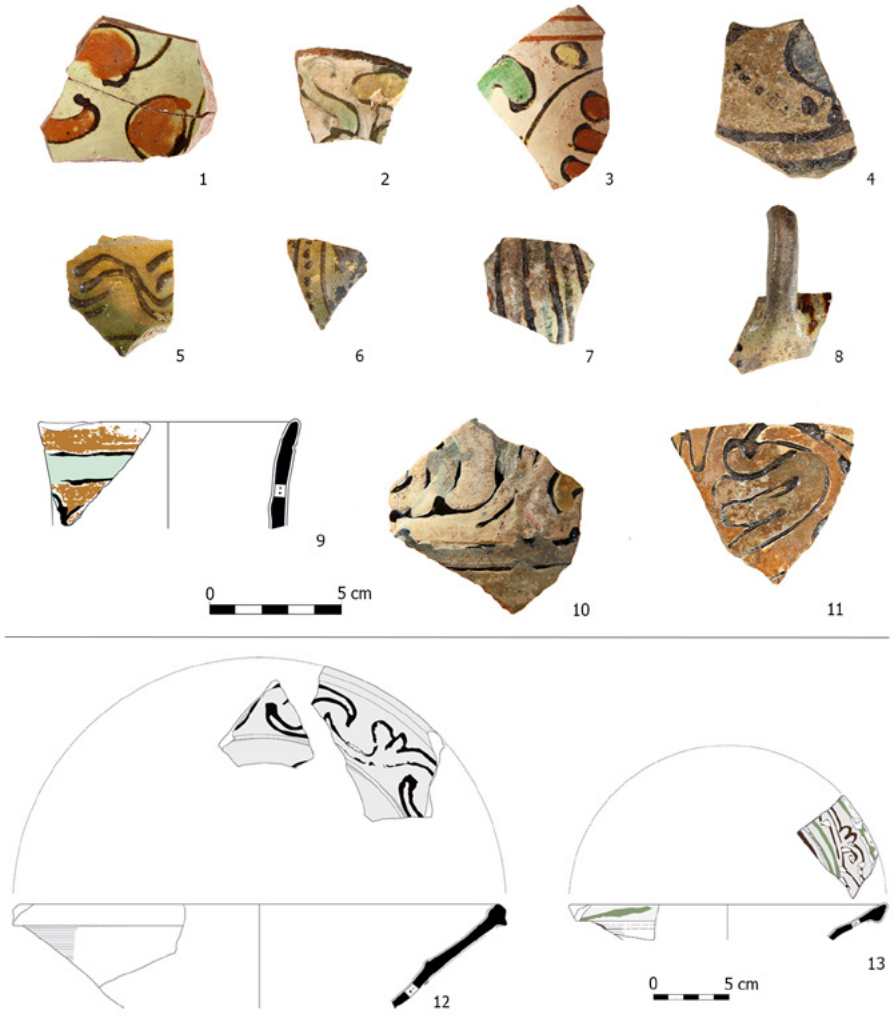

Fig. 2. Slipware from Tykocin Castle with bright slip overlay, brown outline, and precisely painted ornaments, 17th century: 1–3, 10–13 – floral motifs; 4 – zoomorphic (?) motif; 5–9 – geometric motifs. Drawing by M. Wagner, photo and computer graphics by W. Bis.

3) presumably zoomorphic (1 item) – since the ornament is only partly visible, it remains unclear whether it is a schematic depiction of a sitting bird (its torso and legs) or an element of a different motif (Fig. 2:4);

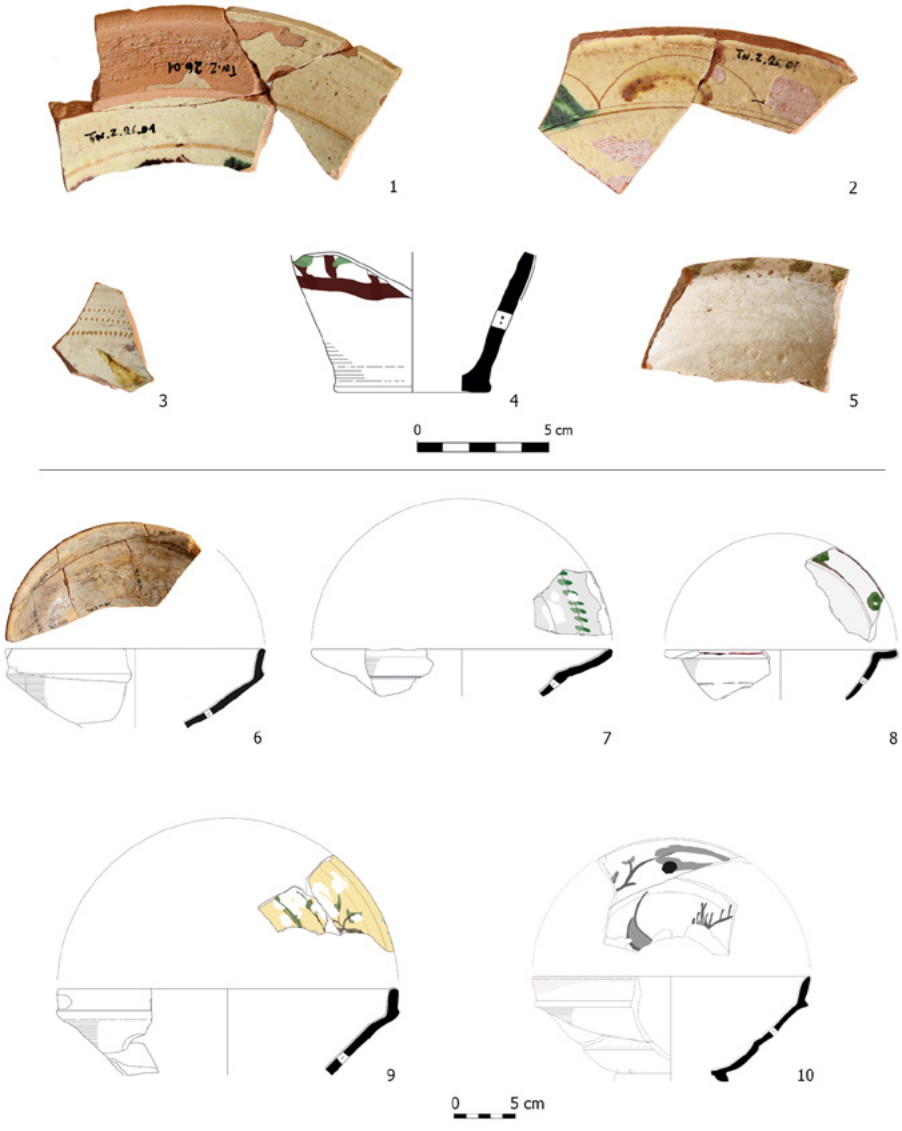

Fig. 3. Slipware from Tykocin Castle with bright slip overlay, simplified painted ornaments, and decorated with other techniques, the second half of the 17th–18th centuries: 1–5, 7–10 – painted ornament; 2 – sgraffito ornament; 3, 6 – chattered ornament. Drawing by M. Wagner, photo and computer graphics by W. Bis.

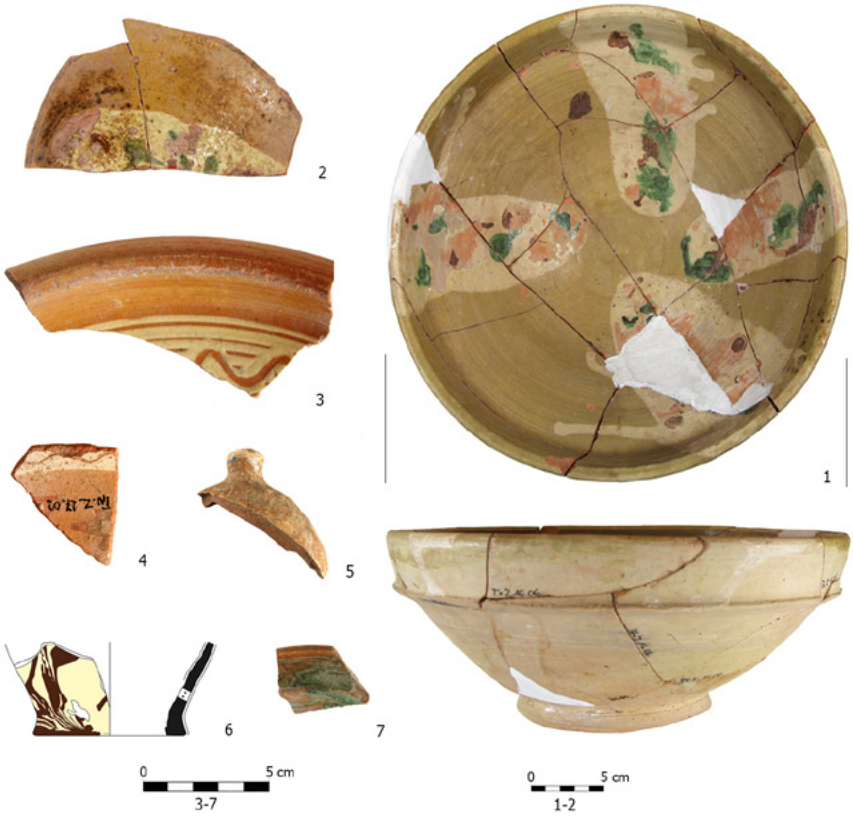

Fig. 4. Slipware from Tykocin Castle with bright (1-4, 6-7) or dark (5) slip overlay, simplified painted ornament, and decorated with other techniques, the second half of the 17th–18th centuries: 1–2, 5 – spots; 3–4 – sgraffito ornament; 6–7 – marbled decoration. Drawing by M. Wagner, photo and computer graphics by W. Bis.

4) colour spots (11 items, i.e., 14.7%) – usually monochrome (green or brown), sometimes bichrome (brown-green), occasionally with streaks scattered irregularly across the surface (Figs 4:1–2; 5);
5) marbled decoration (2 items, i.e., 2.6%), rare. This ornament was created through marbling – partial mixing of two slip colours on the surface of a vessel (MPRG 1998: chapter 13.2). The marbled decoration is bichrome (white and green or white and brown; Fig. 4:6–7).

The analysed potsherds lacked other original painted motifs, such as human figures, genre scenes, symbols, dates, or sentences.

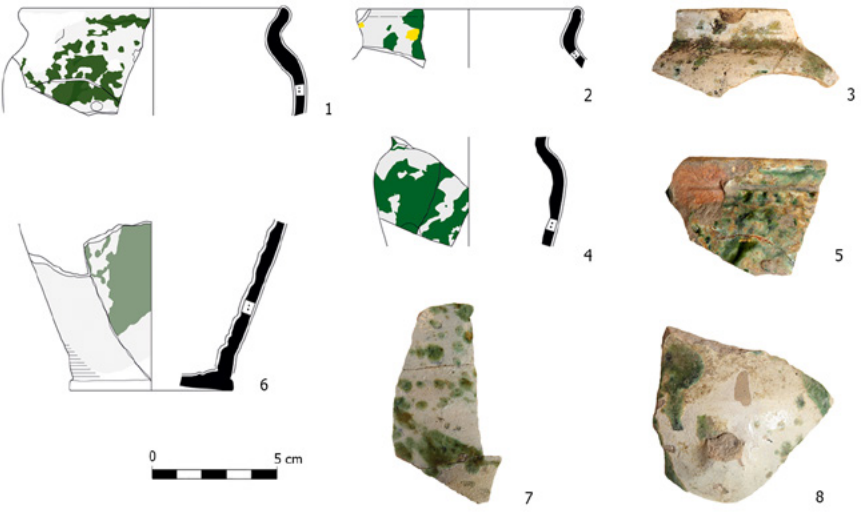

Fig. 5. Slipware from Tykocin Castle with bright slip overlay and simplified painted ornament, the second half of the 17th–18th centuries: 1–8 – spots. Drawing by M. Wagner, photo and computer graphics by W. Bis.

The employed colour scheme is limited to several hues: green (a grass-like colour being the most common), brown, white, and yellow, with occasionally occurring turquoise, bluish, or reddish. In 20% of the vessels, the patterns are outlined in a colour contrasting with the underlayer, which adds to the regularity and sharpness of the motifs. The outline is almost always brown (15 items), with a single white example.

On several vessels, the ornament was applied with different techniques. In three cases (4%), it was sgraffito where a part of the slip was removed with a sharp tool to reveal the colour of the underlying layer or that of the clay itself (Orton and Hughes 2013: 88; MPRG 1998: chapter 12.6) creating a pattern of thin wavy and semi-circular lines (Figs 3:2; 4:3–4). However, five other items (7%) were decorated with rows (bands) of dots impressed with a chattering tool or a roulette. These dots are dark since their colour matches that of the redware body uncovered below the layer of bright slip (Fig. 3:3, 6). This technique is known as chattering or hemring, in German: *Kerbstichdekor*, *Springfederdekor*, *Hemrad dekor* (see Heege 2019a: 95–96; 2019b: 84).

Only on three of the analysed vessels was the ornament created with different techniques combined – painted ornament with sgraffito (Fig. 3:2) and painted ornament with chattering (Fig. 3:3).

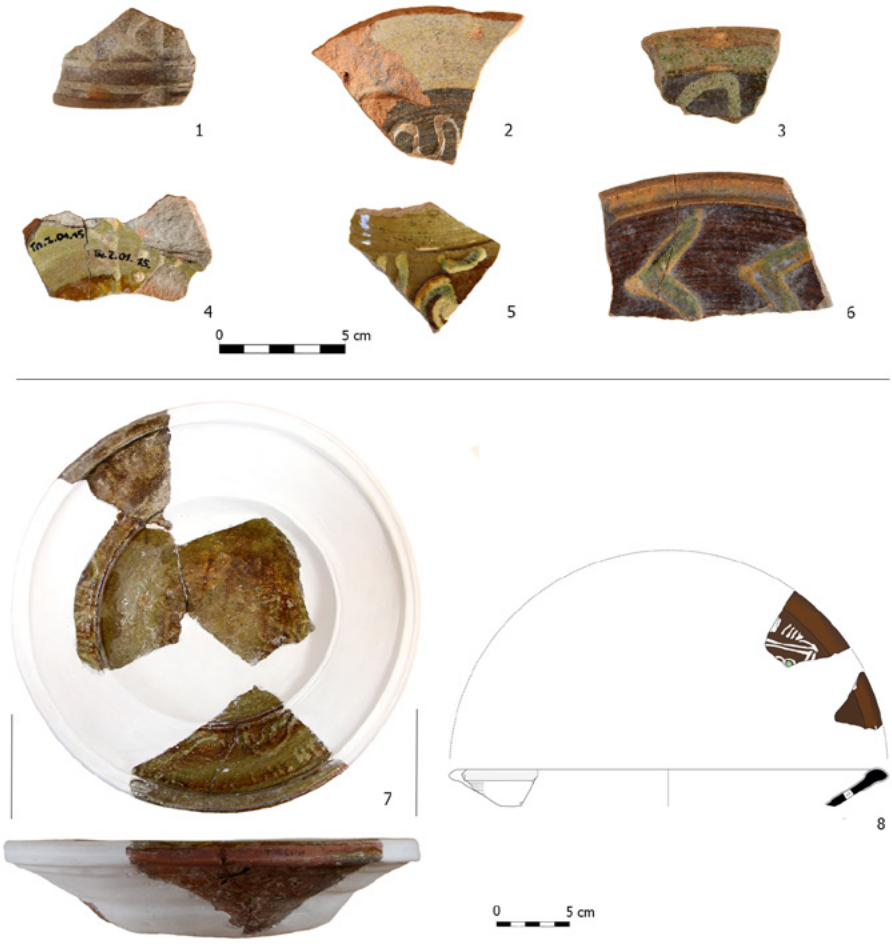

Fig. 6. Slipware from Tykocin Castle with dark slip overlay or without slip cover, with precise and simplified painted ornament, the 17th–18th centuries: 1–3, 5–8 – geometric motifs; 4, 8 – floral motifs. Drawing by M. Wagner, photo and computer graphics by W. Bis.

The most common category in the Tykocin slipware assemblage are plates (see Table 1), which represent shallow dishes (e.g., Figs 2:13; 3:7; 6:7–8). As far as the fragmentation of the vessels allowed, it could be determined that in most cases (6 specimens) their shoulder and body were of similar height, with both parts separated with a gentle cut; alternatively, in rare cases, the shoulder was shorter than the body or the other way round (cf., MPRG 1998: chapter 5.4, forms a–c). Their edges (n=12)

are usually everted from the vessel wall (5) or, less commonly, formed differently – inturned (3), clubbed (2), or flat (2; cf., MPRG 1998: chapter 11.7.1). Typically, the profile of the rim is collared (7), in some cases thickened (3) or simple (2). The diameters of the edges of the rims range from 20 to 31 cm. Recurring sizes are 28 (in 4 specimens), 26, and 30 cm. The bases of the plates (n=8) are 8 to 12 cm in diameter, with three specimens measuring 11 cm. It is equally common for them to either have a footring or not; but when they do, the footrings are flat and their surfaces are smoothed. The only reconstructed specimen is 5.5 cm high. Decorations are applied from the inside, both on the bodies and the rims of the vessels.

The bowls come in diverse sizes, from small through medium to large, although the bigger ones are the most common (e.g., Figs 2:12; 3:6, 8–10; 4:1). The prevalence of large bowls is evidenced by their rim diameters ranging from 10 to 28 cm and divided into three size categories: 10–11.4 cm (3 specimens); 16–20 cm (3); and 21–28 cm (7). In regard to the profile of their walls, they represent three types: carinated, flared, and rounded bowls (MPRG 1998: chapter 5.1.1–5.1.6). Their preserved and measurable bases (n=4) range between 10 and 12 cm in diameter. In two cases, it was possible to determine the height of the vessels – 8 and 10 cm. In terms of depth, they were probably shallow and medium vessels (MPRG 1998: chapter 5.1). As shown by the investigated sherds (n=13), the angle of the rim is usually everted (8), sometimes flat (3) or upright (2), whereas the rim forms include: rounded (5), simple (4), thickened (3), and collared (1). The profile of the rim edge is usually rounded (7) or bevelled (6). The shape of the base in profile is concave or flat, with the majority of the bases smoothed from the outside. The ornament is found on the inside of the bodies and the bases or flattened mouths.

Since the plates and bowls are open wares, their inner part forms the largest and most exposed surface suitable for presenting diversely arranged decorative elements. This is attested even by the fragmentarily preserved slipware vessels discussed in this paper. It also reveals this pottery's important decorative purpose.

The pots in the discussed group of vessels are rather small and morphologically close to rounded mugs, i.e., mugs with a rounded body profile below a deep neck and with vertical loop handle(s) (MPRG 1998: chapter 6.3.5); such handles were found on three of them. It may be assumed that these pots were used as individual drinking vessels (Fig. 5:1-4, 6, 8). The diameters of their mouths (n=5) measure 8, 10, and 12 cm (the last measurement obtained from a single specimen), whereas the bases (n=2) – 6 and 7 cm. The shape of the rim is everted (3 specimens) or inturned (2) in relation to the vessel wall, whereas the profile of the rim edge is rounded or bevelled. Only one base is fitted with a foot. Rod handles are oval in section, measuring 1.2 and 1.4 cm in width. The surface of the pots was covered exclusively in white slip, on which was applied decoration composed mostly of monochrome (green) spots, sometimes with streaks, chaotically scattered across rims and bodies. The decoration of these pots shows the most consistency and the least diversity compared to the other vessels.

Mugs, i.e., basic drinking vessels, are preserved as bodies (5) and a base (1; Figs 2:3; 5:7; 6:1). The base has the diameter of 8 cm and has a foot. The shape of the bodies suggests that they derive from barrel-shaped, conical, or cylindrical mugs. Presumably, they had different capacities. The majority of the sherds are covered with a bright slip with various patterns (5).

Information about the jugs is limited, due to their fragmentary state of preservation. Mostly parts of bodies (5 specimens) were recovered, along with a single fragment of a rim (Fig. 2:9–11). These small sherds reveal little about the shapes of the whole jugs. However, it may be supposed that they were relatively pot-bellied vessels – pear-shaped or shouldered jugs (MPRG 1998: chapter 3.1). The rim, 12 cm in diameter, is upright (in angle), simple (in form), and internally bevelled (in rim profile). The ornament was applied on a bright or coloured underlayer.

The only lid from the assemblage is a fragmentarily preserved specimen with a shallow domed profile and a central integral knob (Fig. 4:5). The knob is wedge-shaped in elevation (MPRG 1998: chapter 7.1.4c) and measures 1.5 cm in diameter. In this case, the ornament, presumably with floral motifs, was applied on a background layer of dark slip.

PROVENANCE, CHRONOLOGY, AND FUNCTION OF SLIPWARE VESSELS

The slipware used at the castle in Tykocin probably comes from at least several manufacturing centres operating in the post-medieval period. In this context, it is crucial to determine whether they were local products or imports. Answering this question requires indicating those features that would enable identification of particular manufacturing regions and more precise dating of the Tykocin finds.

In terms of technological sophistication, the slipware from the whole discussed period, i.e., from the second half of the 16th century to the second half of the 18th century, is relatively consistent. The basic differences in quality are best visible in ornamentation, despite it being only partially preserved. Two quality standards could be distinguished: carefully and precisely executed, presumably by proficient craftsmen not without a spark of creativity; and more schematic, merely referencing certain stylistic tendencies seen in slipware production, manufactured in a sparing and simplified way by pottery-makers with average skills.

The first group would include most of the specimens with bright background, some vessels with the ornament painted against a dark underlay but outlined with a contour, and specimens with marbled decoration or ornamented with sgraffito and chattering techniques.

These fragments predominantly show features characteristic for the output of the Miechocin workshops from the 17th century in terms of the precision of the paintings,

execution of their elements, composition, and colour scheme. The above applies to vessels decorated with different patterns (Figs 2:1–4, 9–13; 4:6–7; 5; 6:6, 8): floral and geometric on bright background (e.g., Szetela 1969a: 8, Figs 18; 11, Fig. 31; 13, Fig. 45; 15, Fig. 57; 30–31, Fig. 123–125; Szetela 1969b: 58, Fig. 57–59) and dark underlay (Szetela 1969a: 11, Fig. 37; 24, Fig. 93; 26, Fig. 102; Szetela 1969b: 92, Fig. 41), with a bird(?) motif (Szetela 1969a: 22, Fig. 83), and with marbled decoration (Szetela 1969a: 21, Fig. 80; 1969b: 91, Fig. 38). Analogous products, especially related to the peak of the Miechocin production, are discovered in many places across Poland, e.g., in Elbląg (Marcinkowski 2009; 2019), Gdańsk (e.g., Oniszczuk 2013b: 95, nr 439–440, 442–443; Dąbal and Szczepanowska 2018: 181–182, Fig. 14:1, 4), Janowiec (Gajewska and Kruppé 2017: 141, tabl. 8:1–8), Gdańsk-Wisłoujście (Dąbal 2015), Płock (Trzeciecki 2016), Poznań (e.g., Poklewska-Koziełł 2013; Paterczyk 2018), Puck (Milewska and Kruppé 2014; Starski 2015), Stargard (e.g., Kwiatkowski and Majewski 2016), and Warsaw (Mierosławski 1979; Meyza 1991; 1993; 1996; 2017a; Starski 2013).

The provenance of the specimens decorated with the sgraffito technique has not been determined (Figs 3:2; 4:3–4). The reason for that is their poor state of preservation which prevents identification. It is possible that they are of local production, like similarly decorated finds e.g., from Skaryszewy (unpublished materials, oral communication from Dr Michał Starski).

The vessels with the chattered decoration (Fig. 3:3, 6) probably come from workshops located in Mecklenburg-Vorpommern/western Poland or Sweden (cf., Heege 2019a; 2019b) since specimens from Tykocin find closest parallels in similarly decorated vessels from Myślibórz, dated to the late 16th and early 17th centuries, and Giessen (Heege 2019a: 100–101, Fig. 8; 2019b: 89, Abb. 10), as well as those discovered in the Carslburg Castle near Bremerhaven (Heege 2019a: 103, Fig. 15; 2019b: 91, Abb. 17) and Malmö (Heege 2019a: 107–108, Fig. 23). Analogous fragments were obtained, for instance, in Poznań (Poklewska-Koziełł 2013: tabl. 13: 20), Puck (Starski 2015: 117, ryc. 113:6), Siedlęcin (Wojenka 2016: 235, ryc. 2:9), and Stargard (Kwiatkowski and Majewski 2016: 182, ryc. 5:60).

The second group, in turn, would include vessels ornamented with colour spots, painted decoration applied directly on the body, and that applied on a dark underlay but without an outline. These also happen to be the youngest finds within the assemblage.

This group of finds may be well represented by two bowls and a plate. The bowls have redware bodies decorated only with strips of white slip covered with irregular green and brown spots (Fig. 4:1–2). The remaining part of their inner surfaces is undecorated and covered with transparent glaze. Their provenance is difficult to determine; perhaps they were imports. They may be dated to the period between the late 17th century and the second half of the 18th century. A similar specimen was found, for example, in Amsterdam, dated to the years 1700–1850, and originating from the Lower Rhineland (Gawronski 2012: 277, no. 995).

The plate is an unfinished product (Fig. 6:7). A part of its body was covered with brown slip, but the layer melted and blurred. On top of it, a white slip was applied to paint a jagged geometric pattern. The find came from a layer dated to between the 17th century and the second half of the 18th century. Such subpar specimens may have originated from local Podlachian pottery workshops, perhaps operating outside the guilds. I was unable to find any analogies for it in the published works. Potters were active in Tykocin itself and other towns of the region in the post-medieval period, as attested by written records, but there is no information whether slipware was manufactured there at the time (cf., Maroszek 1976).

On the other hand, vessels ornamented with loosely scattered colour (green) spots against an overlay of white slip (Fig. 5) were produced, for example, in the Miechocin workshop in the 18th century (Szetela 1969b: 100, 103, Fig. 69). Such artefacts are known, for instance, from Warsaw (e.g., Meyza 1996: 58–59, no. 32; 80–81, no. 44; 82–83, nos. 48–50), Gdańsk, where they are considered imports from Miechocin (Oniszczuk 2013b: 427, 438), and Prague from the 17th and 18th centuries. In the last case, they were supposedly products from the Czech centres in Beroun or Levín (Matějková 2019: 136–137, figs 6–7). The finds from Tykocin Castle are stylistically and chronologically consistent with the aforementioned specimens. They may be dated to the first half of the 17th (?) century and between the mid-17th century and the second half of the 18th century. However, it is difficult to define where exactly they were manufactured. They are a testimony to pottery trade on, at least, interregional level.

The attribution of the vessels preserved as small fragments with non-characteristic ornamentation remains unknown (e.g., Figs 2:5–8; 3:4–5, 7–8; 6:2–5). Hence, the route which brought these items to Tykocin Castle cannot be reliably reconstructed. Some of the fragments lacking distinguishing features but of otherwise high quality are likely to have been imported from Western Europe.

How did they end up in the castle household? Polish goods were probably bought at local markets and fairs or delivered as a part of the tributes due to the castle. However, there are no written records explicitly confirming such a practice. On the other hand, in the case of the foreign vessels, there are many potential ways of reaching to the fortress. They were purchased (just as many other imported goods) predominantly in the capital (Warsaw) or in the Baltic ports (Gdańsk and Königsberg). Alternatively, they could have been ordered directly from foreign workshops, as evidenced by the 18th-century written accounts about pottery bought for Jan Klemens Branicki (cf., Bis forthcoming).

An equally important question is the way in which slipware was used. Its aesthetic features and the morphology of the vessels would undoubtedly make it a suitable table ware for serving dishes, eating, and drinking. For the same reason, they could have been used as interior decoration, especially that some vessels were prepared specifically for this purpose (e.g., a bowl with a perforated foot for hanging it as a decorative dish).

Their technical parameters combined with the decorative potential suggest that their quality surpassed that of the cheapest and most common kitchen ware – brownware, greyware, and redware. The same is true for the less numerous white ware, of slightly higher quality and also glazed, which would be put on the table and serve secondary purposes in the kitchen and larder. As indicated by the analysis of ceramic finds from Tykocin Castle, the quality and status of the slipware match those of the common vessels of the so-called Pomeranian faïence but are significantly below the quality of other faïences – imported or produced in Polish manufactories – as well as majolica, stoneware, and porcelain – more expensive and rarely recorded in archaeological layers. The slipware was probably used by officials, craftsmen, administrators, etc. – a wide group of consumers of average means – who would have resided in the building.

It is assumed that the demand for this kind of pottery in European countries was a result of the growing requirement for more sophisticated goods, serving as ceramic substitutes for metal- and glassware. This process was fuelled especially by the aspirations of the lower classes to imitate the lifestyle of the aristocracy. Other factors contributing to it may have been an inflow of imported goods and cosmopolitism (cf., Cumberpatch 2003; Gaimster 2006). The local slipware production was a response of the domestic workshops to the new styles and solutions developed by western European workshops and renowned Polish manufactories. As demonstrated by the analysed vessels – probably made in Podlachia region, with mixed results.

CONCLUSIONS

The slipware obtained from Tykocin Castle, despite the limitations caused by its fragmentary preservation and damaged vessel surfaces, has prompted interesting observations. The assemblage included specimens representing the most popular morphological-stylistic trends and decorative techniques and motifs used in post-medieval pottery from different manufacturing centres. It seems likely that it originated predominantly from Polish workshops, including the renowned Miechocin or the Western-Pomeranian Myślibórz, as well as undetermined foreign production centres. It also contains products of other local workshops, presumably from Podlachia region, which delivered poor imitations of the superior slipware. The majority of the Tykocin finds is dated to the 17th and 18th centuries.

They are an example of, and a testimony to, one of the innovative trends in the pottery-making of that period. On the other hand, they also illustrate an important process taking place within post-medieval pottery production – a gradual downturn in the artistic value of the products until it reached the level comparable to the folk pottery of the 19th century.

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Modern Ceramic Chafing Dishes in Northern Poland

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Ceramic chafing dishes are very unique finds. Archaeological research in Poland, until now, has provided no information on these artefacts. In this paper, a selection of finds from Gdańsk and Słupsk are presented for the first time. The paper also includes some preliminary remarks about consumption patterns in modern Northern Poland.

KEY-WORDS: Chafing dishes, ceramic, Poland, Gdańsk, Słupsk, archaeology

INTRODUCTION

Chafing dishes are domestic utensils used for holding burning charcoal or other combustible materials, to cook food or to serve it hot at the table. The terms used for the dishes have similar origins in various European countries. In France, the most commonly used names are *chauffe plat* or *réchaud de table*. A similar term is used in English – "chafing dish". The Spanish names for these vessels are *anafe* or *anafre*. The Dutch name for these vessels is *komfoor*. Finally, German names used for both metal and ceramic vessels are *Wärmeschale* or *Wärmpfanne*. A suitable Polish name is *podgrzewacz*. All the terms used, establish the major use of these vessels, which is for warming dishes.

During the past few centuries, chafing dishes were made of clay or metal and have differed in shape. Two general forms are distinguishable, the first one is a perforated bowl- shaped form with a pedestal, and the second one, a vessel with a perforated pot or bowl shaped body with three pods. Usually, both metal and ceramic dishes have several knobs attached to the rims, and openwork or perforations in the upper part of the body. Further, some more elaborate forms are known, like for example those found in France and Germany (Ravoire 1991: 228; Niederfeilner 2004: 60–61, 107; Bertrand and Robin 2019: fig. 13).

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The origins of these vessels have not been determined, although there are some suggestions in the literature. Carmen Bosch Ferro and Marina Chinchilla Gómez point to Mesopotamia and Southern Asia as origins of this form (1987: 492). This corresponds with more elaborate studies of chafing dishes found in South-East Europe at various archaeological sites within the Byzantine Empire area and its surroundings from the 7th to 12th centuries (Vroom 2008: 293–294; Vassiliou 2016: 252–253; Vakasira 2020). Then, early Spanish finds are dated from the 11th to 13th centuries (Bosh Ferro and Gómez 1987: 493). One 13th century ceramic example of a chafing dish was found in London, Britain (Pearce *et al.*, 1985: 44, 114). There is not much information on other medieval finds, except for 15th century metal, and several ceramic objects, which are known to have come from the Netherlands and Britain (Lewis 1973: 61–63; Bartels 1999: 123–124; Gawronski ed. 2012: 167). Metal chafing dishes are generally dated in Britain from the 15th century (Lewis 1973: 61–63). Early metal 16th century vessels are known to have come from Germany and France (Baumgärtel 1981; Soulat 2015).

Archaeological literature has paid very little attention to this assortment of vessels from the modern period. Limited data exists in archaeological reports, with ceramic chafing dishes usually being mentioned in between other vessels. Those artefacts dated from the 16th century to the 18th century are known from: Spain (Amores Carredano and Chisvert Jiménez 1993: 292); France (Labaune-Jean and Pouille 2012: 3–5, 78–79, Bertrand and Robin 2019: 355); the Netherlands (Klijn 1995: 153–154, Bartels 1999: 123–124, Gawronski 2012: 198, 228, 238, 274, Meulen and Smeele 2012: 72); Belgium (Herremans and De Clercq 2013: 93); Germany (Niederfeilner 2004: 61); Ireland (McCutcheon and Meenan 2011: 102, 107) and Britain (Holling 1969: 28, Huggins 1969: 80–81, Fanning *et al.*, 1975: 109–111, Haslam 1975: 180, Coleman-Smith 2002: 148–149). Recently published information about chafing dishes found in the Czechia, dating from the second half of the 16th century to the 17th century, attributed them to local Prague workshops (Blažková 2019: 116–119). These finds, together with vessels from Gdańsk and Słupsk in Poland, extend the range of the dispersion of ceramic chafing dishes to Central Europe in the modern period.

The use of ceramic chafing dishes in the 19th and 20th centuries is very infrequently reported. Most known are vessels from the Netherlands (Klijn 1995: 155–163; Meulen and Smeele 2012: 206). We know much more about metal utensils from the second half of 19th century, mainly from the American and British commercial markets (House Furnishing Review 1894: 224). In this period, the markets were stimulated by advertisements (Fig. 1), and in the second half of the century, cookbooks dedicated to chafing dishes appeared (Herrick 1895; Hill 1899). In this period, a new fashion for "smart" metal equipment comitted to modern women or modern housewife has been designed (in many advertisements these vessels were depicted as offered as wedding gifts or as Christmas gifts, as well as being "suitable" to a modern house (House Furnishing Review 1894: 224; 1897: 49; 1899: 11, 14, 43; 1903: 177, 385; 1909: 7).

Fig. 1. Metal chafing dish, the early 20th century, The Manning, Bowman & Company Advertisement (Meriden, Connecticut, USA; sources: House furnishing review 1903: 385).

LOCATION OF SITES AND CONTEXT

The six ceramic chafing dishes discussed in this paper were found in Słupsk and Gdańsk on the Polish north coast. For published ceramic assemblages from Northern Poland (Gdańsk Pomerania, West Pomerania) no analogous dishes were found. On present evidence, these recently discovered ceramic chafing dishes from these two locations seem to be the only known finds in these regions of northern Poland.

Słupsk is a small town located about 16 km south of the Baltic shore. The history of the settlement dates back to the early medieval period. The growth and rising economic prosperity of the town lasted from the late medieval to early modern periods. The ceramic chafing dish was found during an excavation conducted in 2017 in the area of the old town square (Marczewski *et al.*, 2017; Fig. 2). During the excavation, the remains of the old Town Hall were discovered (Dąbal 2019: 119–121). The analyzed vessel was found within the medieval Town Hall walls in the demolition layer dated by the excavation team to the 17th century. The raw materials from this feature are mixed and contain artefacts dated from the late 15th century to the second half of 17th century, with the majority of the finds dating to the 17th century.

Five other ceramic chafing dishes were found in Gdańsk (Fig. 3). The city is located on the shore of the Baltic Sea at the mouth of the River Vistula. The urban complex was founded as an early medieval settlement and became a major South Baltic trade centre in the late medieval period with growing economy in modern times. Five

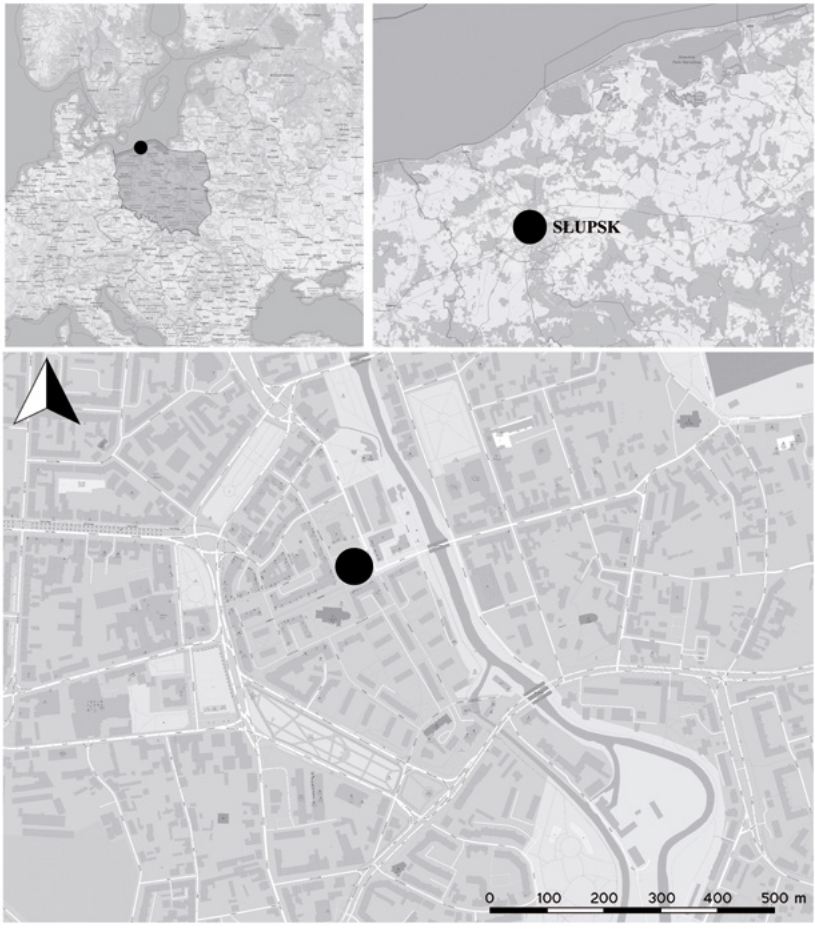

Fig. 2. Słupsk, Old Market Square, plot No. 706/13. Location of the archaeological site (AZP 9-29). Map background: OpenStreetMaps©

chafing dishes were discovered in the south-eastern outskirts of the 16th–17th century city, located then within the area of the fortifications. The artefacts were found in two archaeological sites located at 60 Łąkowa Street (Sadowa Apartments; 2019 excavation; Longa-Prager 2020) and 4–5 Reduta Wyskok Street (2018 excavation; Kocińska 2020). Both localizations refering to the city sectors which were drainaged during the 17th and early 18th centuries and gradually become housing quarters. One chafing dish from the 60 Łąkowa Street site was discovered in a levelling layer in the context of other finds dated from the 17th to early 18th centuries. Four vessels from the 4–5 Reduta Wyskok

Fig. 3. Gdańsk, 4-5 Reduta Wyskok Street (1), 60 Łąkowa Street (2). Location of the archaeological sites (AZP 12-44/147; AZP 12-44/203). Map background: OpenStreetMaps©.

Street site were discovered in levelling layers dated to the 18th century. The artefacts were found in the context of materials dated from the early 17th century to the 18th century.

CHAFING DISHES FROM SŁUPSK AND GDAŃSK

The six wheel turned, redware chafing dishes were distinguished from the ceramic assemblages excavated from three archaeological sites located in Gdańsk and Słupsk.

All utensils are partly preserved. Each of them is described with fabric information and metrical data.

The first chafing dish is preserved only as a pedestal and a fragment of a bowl. The body ware is made of fine clay matrix with a scatter of fine sand and fired buff-red. It has a lead glazed upper part (Fig 4). Some irregular splashes of iron wash (or a dusty splash of glaze) can be recognized on the lower part of the vessel's body. The bottom is about 9.7 cm in diameter. The conical pedestal is 3.3 cm high. A triangular opening was cut in the pedestal which has an additional small circular vent. Only a little part of the upper bowl is preserved. The connection between the pedestal and the bowl is vented with seven circular openings from 3.5 mm to 7.4 mm in diameter. No traces of use were noted on the surface and interior. This vessel was found in a context dated generally to the 17th century. Most of the ceramics in this assemblage (1017 fragments) were represented by lead glazed redware and some slipware. No faience sherds were noted. The general dating of the context referred to several later finds dated to the second half of the 17th century. The material context indicates that the chronology of the vessel might be considered to be for the second half of the 16th century to the early 17th century.

The second chafing dish is preserved only as a part of the rim with one knob (Fig. 5). The ware is rough gritty fabric with quartz sand and fired dark red. The vessel is green glazed. The bowl rim is 24 cm in diameter and the knob placed on the rim is about 3 cm high. Under the rim, eight circular vents, each of about 4 mm in diameter are preserved. The utensil was discovered in Gdańsk during the excavation at Łąkowa Street. The context is dated to the early 18th century. The ceramic assemblage here is very small (115 fragments), and 28 of them date back to the 17th century.

A group of four chafing dishes was found in Gdańsk at 4–5 Reduta Wyskok Street. All of them differ in details regarding their shape and fabric.

Two in the assemblage were found in the same context (Fig. 6). The first chafing dish is preserved only as a part of the rim with one knob and a broken horizontal handle (Fig. 6:1). The vessel is rough and sandy fabric, buff-red fired and green glazed. The rim is 18 cm in diameter. The body seems to be a little S-shaped with a barely visible ledge placed at the height of the horizontal handle. The second is a chafing dish preserved only as a small part of the rim with a knob (Fig. 6:2). The body ware is made of gritty clay with large quartz sand fractions. The dish was fired dark red. The vessel is green glazed, but the outer glaze has been applied on a white slip. The rim is 17 cm in diameter. The body seems to be a little belly shaped. Five circular vents are preserved in the body. Both chafing dishes were found in the same context, dated to the 18th century, but most of the ceramic assemblage (411 fragments) dates back to the 17th century. The general dating of these two vessels, referring to the context, is considered to be the 17th century.

The third chafing dish from this site is preserved only as a part of the rim (Fig. 7). The body ware is fine clay matrix with some medium sized quartz sand fractions and

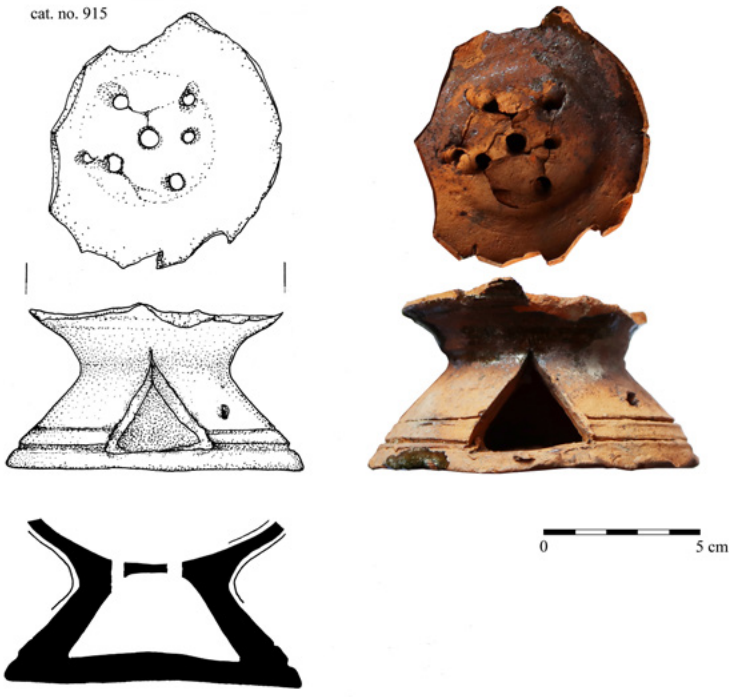

Fig. 4. Słupsk, Old Market Square, plot No. 706/13. Chafing dish. Drawn by A. Dmitruczuk. Photo by J. Dąbal.

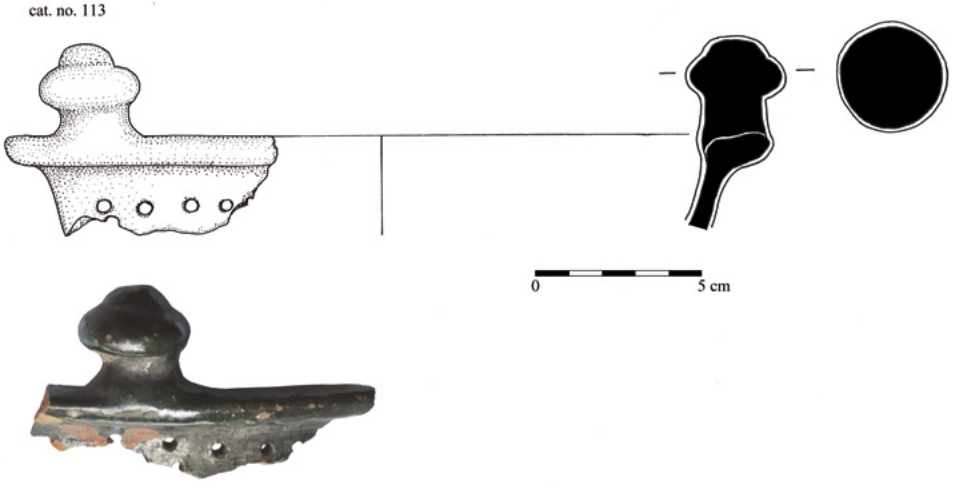

Fig. 5. Gdańsk, 60 Łąkowa Street. Chafing dish. Drawn by A. Dmitruczuk. Photo by J. Dąbal.

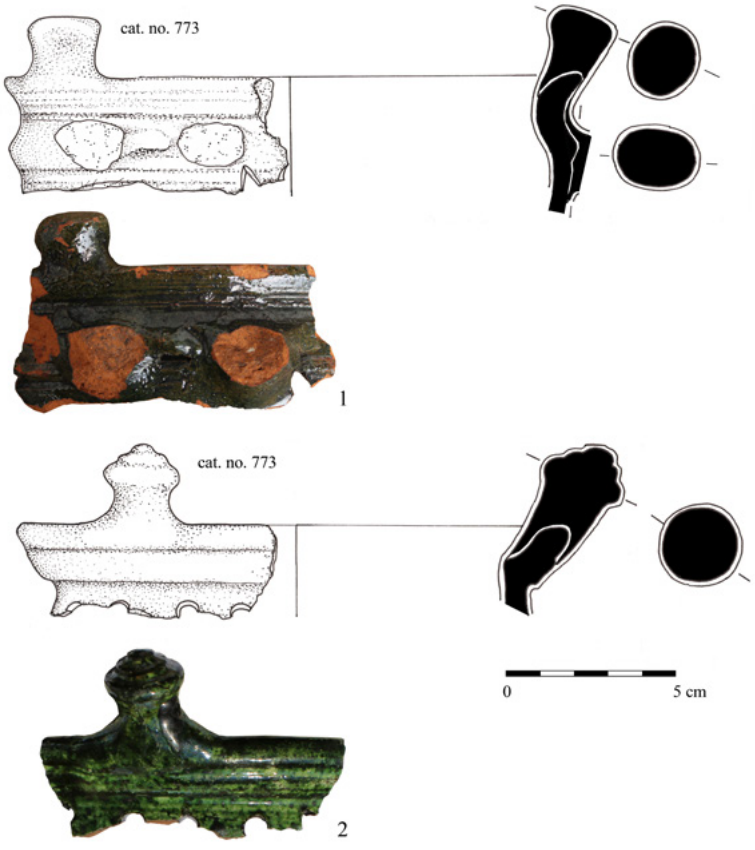

Fig. 6 . Gdańsk, 4-5 Reduta Wyskok Street. Chafing dishes. Drawn by A. Dmitruczuk. Photo by J. Dąbal.

fired pale dark red. The vessel is green glazed. Both surfaces are covered with glaze on white slip. The edge of the vessel is 15.5 cm in diameter with an additional double ledge applied around the rim. In the body of the partly preserved vessel, two triangular vents are noted. The context is dated by the excavation team to the 18th century, although most of the ceramic assemblage (147 fragments) date back to the 17th century.

The last chafing dish is preserved only as a part of the rim with one knob (Fig. 8). The body ware is rough and sandy fabric, buff-red fired. The light green glaze on the surfaces of the vessel has been applied on white slip. The vessel is in a very poor condition with a oxidized glaze. The body of the vessel was probably bowl shaped. The rim is 24 cm in diameter. Two partly preserved circular vents were noted in the body. The

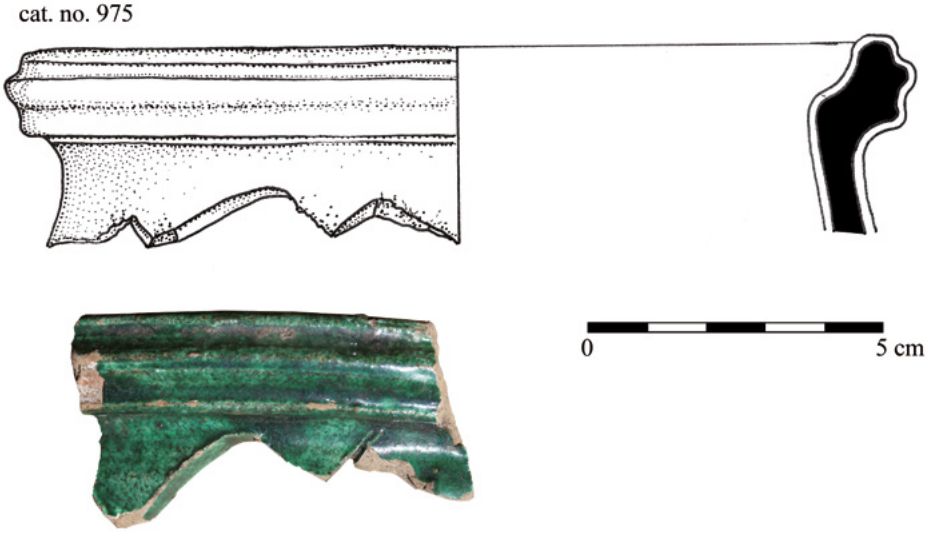

Fig. 7. Gdańsk, 4-5 Reduta Wyskok Street. Chafing dish. Drawn by A. Dmitruczuk. Photo by J. Dąbal.

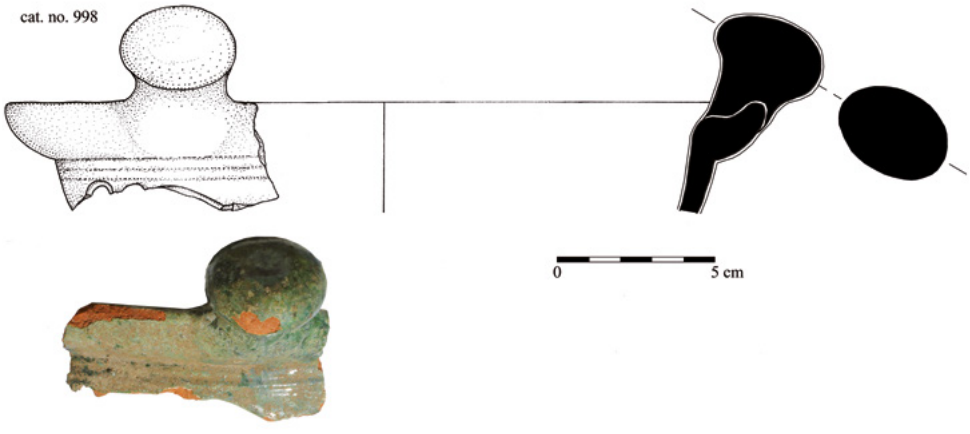

Fig. 8. Gdańsk, 4-5 Reduta Wyskok Street. Chafing dish. Drawn by A. Dmitruczuk. Photo by J. Dąbal.

vessel was found within a small ceramic assemblage (8 fragments) from the context dated by the excavation team to the 18th century, although ceramics from that context are dated to the 17th century. The vessel's chronology is considered to be the 17th century.

DATING OF THE FINDS

The archaeological contexts (levelling layers) of all the chafing dishes range between the 17th and 18th centuries, but the chronology of particular finds and assemblages dates back from the 15th to 18th centuries, with a predominance of 17th century materials. The final dating of vessels was set with reference to their fabric and rim shapes. General technological attributes for redwares, like iron splashes on the pedestal under light glazing (Fig. 4), green glazing (Fig. 5, 6:1) and green glazing applied on engobe (Fig. 6:2, 7–8), are indicators for dating them from the second half of the 16th century to the 17th centuries. Because of the rarity of ceramic chafing dishes in archaeological assemblages that could be used as further reference, for comparing the shapes of ceramic bodies and rims, profiles of pots, tripods and bowls were used. The vessels with olive glazing and horizontal handles (Fig. 6:1) were formed in the 16th century manner. Similar rim shaping is displayed on chafing dishes from Dordrecht, the Netherlands dated from 1550–1590 (Bartels 1999: 748). Late 16th century dating might also be considered for a bowl shaped, green glazed body of a chafing dish from Gdańsk (Fig. 5). Similar rims are recognized in chafing dishes found in Tiel dated from 1540–1570 and a ceramic assemblage of bowls, tripods and chafing dishes found in Freiberg, Germany dated to the late 16th century and later (Bartels 1999: 748; Niederfeilner 2004: 60–61, 107). Three other vessels, green glazed on engobe (Fig. 6:2; 7–8), were dated according to the shapes of the rims of ceramic assemblages from Lyon, France, Donyatt and Cove, Britain and Dordrecht and Nijmegen, the Netherlands (Haslam 1975: 180, 182; Bartels 1999: 651, 723, 753; Coleman-Smith 2002: 133, 140, 148; Bertrand and Robin 2019: 352, 355, 363). A similar chafing dish to the one from Słupsk, consisting of a preserved pedestal with a triangular vent (Fig. 4), were found in Dutch and British ceramic assemblages and dated from the late 16th century to the first quarter of the 17th century (Haslam 1975: 180, 182; Hurst *et al.*, 1986: 80). These dating conclusions refer to the probable time of use of the vessels, although they were excavated from layers generally dated to the 17th and 18th centuries.

DISCUSSION

While dating chafing dishes found in Poland does not cause confusion and generally points from the late 16th century to the first half of the 17th century, their origins are

very uncertain. All of analysed chafing dishes are not local products. At this stage of research, three destinations are considered as a preliminary place of the workshops. Most probable is their French (probably central France) or British origin (most probably the London basin); in one case, a Dutch origin may be concidered. The indicators for this preliminary conclusion are the fabrics and forms. Both French and British forms are most alike to those found in Gdańsk and Słupsk. These have a conical pedestal and round shaped knobs on the rim, which are found in France and Britain (Moorhouse 1970: 44, 46; Coleman-Smith 2002: 148–149; Horry 2015: Fig. 115; Bertrand and Robin 2019: 363). In the case of the vessel preserved in the pedestal part, the most alike are French and British-type chafing dishes (Haslam 1975: 180, 182; Pryor and Blockley 1978: 69, 71, Fig. 17; Pearce *et al.*, 1985: 4–5). Most doubts about the origin of chafing dishes are concerned with the vessels preserved in part of the rim with a horizontal handle (Fig. 6:1), or a rim with a triangular vent (Fig. 7). The exact analogous chafing dishes have not been found. Redware vessels of that period with horizontal handles are very common in the Netherlands, some analogical types of knobs (Fig. 6:1) were also recognized among Dutch examples, although no comparisons with fabrics have yet been identified (Klijn 1995: 153–154). More data and further comparative studies on chafing dishes are necessary for final conclusions on their origins. At this stage of research, confirmed cases of locally-produced chafing dishes come from France, Britain, the Netherlands and recently from the Czechia (Mayes 1968: 73–74; Crossley 1972: 65; Haslam 1975: 180, 182; Coleman-Smith 2002: 148–149; Meulen and Smeele 2012: 72, 206; Horry 2015: Fig. 115; Blažková 2019: 116–119).

CONSUMPTION PATTERNS

The group of ceramic chafing dishes discussed here is generally dated from the late 16th century to the 17th century. Although the range of archaeological and historical data is wide (Kizik 2000; 2001; 2020; Barylewska-Szymańska 2015), for this period we know very little about consumption patterns in Gdańsk and Słupsk. Chafing dishes are rare finds in Germany, the Czechia and in Poland and are mainly related to city spaces. These types of vessels are better known from France, Britain and the Netherlands. Although some locally produced forms were discovered, between the 16th and 17th centuries these are still rare finds, even in the mentioned areas. Referring to the macro context of the finds from Gdańsk and Słupsk presented here, the chafing dishes were more probably used for warming up dishes or finishing dishes by the table, while using them as small portable kitchens (as suggested in the literature) is less probable. In Gdańsk and Słupsk, the manner of consumption with the use of chafing dishes at the table might have been influenced by Dutch or British inhabitants and merchants of the Pomerania Region. In the Netherlands, the chafing dishes

were, for example, used to serve meat that was initially fried in the kitchen and then the cooking was finished at the table. The preparation of dishes in this way was called "between two dishes" (*tusschen twee scotelen*). The other example cited in the literature is the use of these vessels to warm up and finish fish or eggs (Jong-Lambregts 2004: 42–43).

The alternative purpose of these vessels might have been to hold burning charcoal or other combustible materials during the fiestas used for lighting tobacco pipes. Preliminary research by André Leclaire was directed to the analysis of historical paintings (2009). Although 17th century Dutch pictured examples, referred to by the author, are tripods without vents or knobs (Leclaire 2009: 189–196).

Analyzing the very scant images of ceramic chafing dishes in paintings, some preliminary remarks can be made about the context of the vessels. A well-known painting with a chafing dish was painted by Diego Vélazques in about the year 1618. In "An Old Woman Frying Eggs" we can see a wealthy young boy whose dish is being warmed by an older lady. The second example is the work of Pieter Cleasz, "Still life", from the year 1627 (Fig. 9). From the arrangement of details, like silver plates and glass vessels, we can conclude that the setting is from a wealthy, or at least, urban background. Compared to 18th century paintings like "Bulle de savon", attributed to Étienne Aubry (Horry 2015: fig. 272) and "Les Apprêts d'un déjeuner",

Fig. 9. Pieter Cleasz, "Still life", from the year 1627 (licenced by Timken Museum of Art).

painted by Bernard Lépicié, it might be seen that the context of the background for chafing dishes has changed. Both paintings present less than wealthy interiors with chafing dishes used for preparing meals on the table. These examples might be considered as initial arguments for a further wider study of the value of ceramic chafing dishes.

Based on the archaeological contexts of the 16th–17th century ceramic chafing dishes, which are limited to wealthy places (meaning a generally higher status of the inhabitants) and the wider market of accessible products, we can distinguish several types of areas where we may expect to find them in excavations, they occur in ceramic assemblages from palaces, centres of international trade, and administrative districts of cities. This background indicates that ceramic chafing dishes of that period, used during table fiestas, were markers of wealth and/or urban life. Furthermore that concerns the habits of long lasting fiestas or "ceremonial" meals.

CONCLUSIONS

Ceramic chafing dishes are very uncommon finds. Archaeological research in Poland has, until now, provided no information on these artefacts. Furthermore no synthetic studies have been undertaken in a broader European context. The context of the use of chafing dishes, derived from archaeological data and initially considered with iconographical evidence, indicates the necessity for further research in the future. However, the presence of these rare imported ceramic vessels in Gdańsk and Słupsk is evidence for the range of dispersion of this type of finds in Central Europe. The origin of the chafing dishes found in Poland is uncertain, although some preliminary remarks on French, British and Dutch references were taken. Their dating generally points from the late 16th century to the first half of the 17th century and having regard to the very limited data base of these ceramics, those from Gdańsk and Słupsk are currently the "oldest" known examples from the region. These Polish examples are definitely later than those of other north European countries, especially the Netherlands and Britain (Lewis 1973: 61–63; Bartels 1999: 123–124; Gawronski 2012: 167). Dating ceramic chafing dishes and the identification of their workshops would be crucial for developing researches on consuming patterns in northern and central Europe. The rarity of ceramic chafing dishes might be interpreted that they were 'precious' (but not necessarily in the meaning of being expensive). It can therefore be concluded that the presence of these finds indicates interpretation of their use in towns amongst their wealthier inhabitants or their use in the international context as part of the urban "way of life".

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Stoneware Jars from the 18th Century from the Saxon Palace in Warsaw

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The article presents a unique set of 18th century apothecary vessels related to the Warsaw court of the Electors of Saxony. The stoneware jars were excavated at the site of the former Saxon Palace in Warsaw between 2006 and 2008. The collection, consisting of seven intact or almost completely-reconstructable specimens, is a unique find in Warsaw and in Poland. The article describes the vessels (their form, decoration and dimensions) and discusses their possible function (storing medicines used by the Saxon court). The study enlarges our limited knowledge about the material aspects of medicine in the Polish capital in the Modern period.

KEY-WORDS: Saxon Palace, Warsaw, Augustus II the Strong, Augustus III, drug jars, stoneware jars, 18th century

INTRODUCTION

The specimens were discovered during archaeological and architectural work carried out in 2006 under the supervision of Ryszard Cędrowski (Cędrowski 2006). The examined area encompassed the centre of the western frontage of Piłsudski Square in Warsaw.

The buildings of the Saxon Palace (Polish: *Pałac Saski*) stood in this place until the Second World War. In 1713, King Augustus II bought an estate originally owned by Andrzej Morsztyn and in the same year ordered the construction of a line of parks and palaces linking the western outskirts of Warsaw with the Vistula River. This urban feature is known as the Saxon Axis (Polish: *Oś Saska*); the Saxon Palace was its main part. It was one of the greatest achievements of Polish town planning in the 18th century, an expression of the absolutist ambitions of Augustus II the Strong, who wanted to commemorate his reign by erecting a personal residence in the Polish capital. Before 1713, the area chosen for the construction of the Saxon Axis was filled with chaotically-arranged buildings of little architectural value, most of which were demolished to create an area resembling a pentagonal fan (Kowalczyk 1997: 39).

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The construction of the Saxon Axis could be divided into three stages. The first one lasted from 1713 to the beginning of the 1720s. During this period, two estates were merged, the above-mentioned Morsztyn estate and the Tarło family estate, acquired in 1714. Along with the existing Baroque (Morsztyn's) palace, the Saxon Garden was designed and created; it was approximately 340 metres long. The next stage lasted until the death of Augustus II in 1733. Other parcels of land adjoining the King's estate were purchased at that time. After all the plots of land had been merged, the urban layout corresponding to the final form of the Saxon Axis was created. In 1721, the estate of the Sanguszko family was acquired (later transformed into the Brühl Palace), and in 1726, the residence of Bishop Teodor Potocki was attached, later transformed into the Blue Palace (Polish: *Pałac Błękitny*), built for Anna Orzelska, daughter of Augustus II.

The main part of the work leading to the construction of the Saxon Axis was the construction of the palace itself, designed by two architects – Carl Friedrich Pöppelman and Joachim Daniel Jauch. To the east of the residence, a trapezoidal courtyard was built, widening towards Krakowskie Przedmieście Street. The northern and southern sides of the courtyard were surrounded by walls. In the garden, at the meeting point of five main arteries, a pavilion called the Great Salon was built in 1724. The construction of the palace in the second stage of the development of the Saxon Axis was erratic, especially towards the end, mainly because of lack of funds. The project, interrupted by the death of Augustus II, was continued by his son, Augustus III, who was elected King of Poland in 1733. In the 1730s and 1740s, the last stage of the development of the Saxon Axis took place. Huge wings were added to the palace at the side of the courtyard and smaller ones on the garden side. The courtyard was widened and given a rectangular shape. In its eastern part, auxiliary buildings were erected, occupied by forges and palace stables.

In 2008, the area adjacent to and partially extending to the outskirts of the southern wing of the former Saxon Palace was examined archaeologically (Cędrowski 2008). The excavations were intended to precede the rebuilding of the palace. The reconstruction plan has not been implemented so far, but the preliminary research made it possible to discover numerous relics of the past; the results of the excavations shed light on some of the questions relating to the Saxon Palace, its surroundings and inhabitants.

Most of the artefacts were found in the northern wing of the former palace in two places interpreted as garbage dumps. They were used at the end of the 18th century. There had been latrines in this place earlier. Artefacts from 18th and early 19th centuries were found on Level V in several layers (mainly Layer 66). One jar was discovered in Zone E (southern wing).

The unearthed specimens have so far-been discussed in a limited number of scholarly studies (Więcek 2012; Klarecki 2017), two popular books (Borowska 2009; 2020) and several articles (Klarecki 2008; Borowska 2011–2012; 2018; 2019a; 2019b; 2019c) describing the discoveries made between 2006 and 2008 (Cędrowski 2007). Regrettably, no monograph of the excavation site has been published so far.

JARS

Stoneware jars were among nearly 8000 items found in the garbage dumps on the site of the former Saxon Palace. The intact specimens, almost complete ones and those that could be reconstructed form a group consisting of seven pieces. Apart from complete specimens, plentiful stoneware sherds were discovered; they indicate the presence of a large number of stoneware vessels at the site. The total number of this type of vessels is 20.

All the jars are almost identical. They have wide, flaring mouths and are incised with horizontal, circumferential lines. The cross-section of the vessels is square in the middle of their height and circular at the base, which is sometimes slightly concave, sometimes flat – usually with cutting-off marks. Often the colour of the body is not uniform, e.g., cream-gray. The vessels are covered with salt glaze. Their height varies between 21 and 23 cm, the diameter of the mouth is between 7.8 and 8.3 cm, the base diameter between 7.8 and 9 cm and the width in the middle of their height between 9.6 and 10.3 cm (Fig. 1).

The royal monogram of the Saxon rulers of Poland – crowned, intertwined letters "AR" – is incised on one side of the vessels (Fig. 1). The monogram on the jars is exactly

Fig. 1. Stoneware jars from the Saxon Palace in Warsaw. Photo by G. Kułakowska.

the same as the monogram on Saxon postal mileposts.[1] Two horizontal, circumferential lines are incised below the royal monogram, approximately 2 cm apart. It is possible that they mark capacities, as in the case of measuring vessels (Kluttig-Altman 2006: 324).

ANALOGIES

I have not been able to find direct analogies to the jars from the Saxon Palace among the published excavation finds either from Warsaw, Poland and the Europe. Many vessels of similar shape have been discovered, but they are made of different materials (glass, metal and also pottery, but of a different ceramic composition), as well as vessels of the same material (stoneware), but of different shapes.

Additional difficulties are caused by the inadequate state of research of modern pottery excavated in Poland, especially stoneware, and scarcity of sources dealing with the history of pharmacy. Publications about stoneware usually focus on tableware and richly-decorated specimens, devoting little attention to storage vessels (for example Dąbal 2012). Most studies related to the history of pharmacy describe glass artefacts, less often mentioning other objects, including pottery (for example Kozłowska and Nowakowski 1987; Więcek M. 2017).

Stoneware jars similar in shape to those described in the present study were found in the Wisłoujście Fortress in Gdańsk (Dąbal 2015: 252). These vessels are 23 cm high, with a mouth diameter of 17 cm. However, their rims have seatings for lids, absent in the specimens from the Saxon Palace. The fragmentary preservation of the finds from Gdańsk makes it impossible to reconstruct their exact shape (Dąbal 2015: 252).

In the city of Gdańsk, during excavations at Świętojańska Street No. 6–7, a ceramic vessel was discovered. This was "made of white clay and its firing technique resembled the technique used to manufacture stoneware vessels" (Dąbal *et al.,* 2018b: 242, Fig. 2). The archaeological context indicates that this small jar may date from the end of the 18th century or the beginning of the 19th century. The authors of the study remark that this specimen appears to be an imitation of stoneware vessels.

At another excavation site in Gdańsk – in the area of the former slaugterhouse – stoneware vessels made in Duingen and Coppengrave were found; they are interpreted as storage and apothecary vessels. The author of their study notes that they are similar to 18th-century specimens, so probably should be dated accordingly (Dąbal 2018: 320, Fig. 21).

Stoneware jars interpreted as storage vessels, produced in England, were also found on board of the wreck of *The General Carleton,* a British ship that sank in the Baltic in

[1] Bernd Brinkmann, oral communication (October 24, 2020).

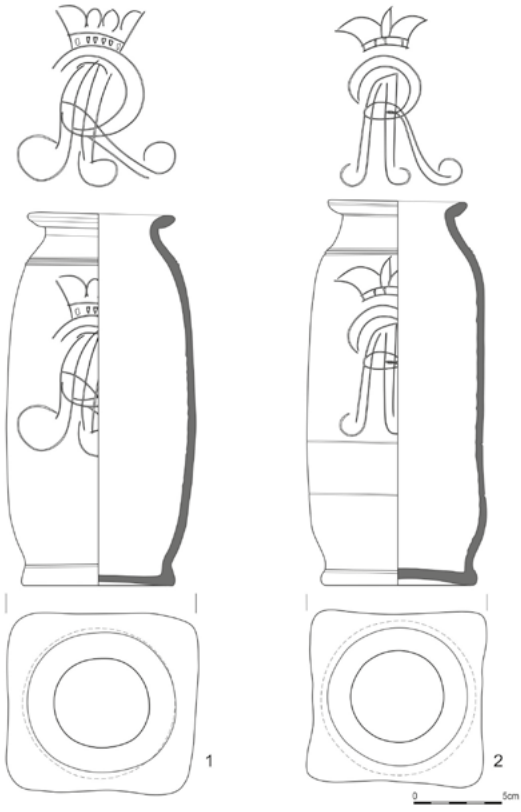

Fig. 2. Stoneware jars from the Saxon Palace. Drawing by U. Skwara-Nieckuła.

1785 near the present-day Polish coast. They came in two sizes: larger (17.5 cm high) and smaller (13.5 cm high), with a wide mouth and cylindrical form (Dąbal 2008: 236).

Vessels of similar shape, but made of faience, were excavated at the Ducal Castle in Szczecin. Their earliest possible date is the second half of the 17th century, but according to the author it is more probable that they come from the 18th century (Cnotliwy 2014: 287).

The archaeological collection of the Museum of Warsaw also contains a stoneware jar related to pharmacy from the 18th century. It is a cylindrical vessel with a diameter of just over 10 cm and a height of nearly 20 cm. It was found in the so-called Saxon Wing of the Royal Castle in Warsaw.[2]

[2] The specimen is currently on display in the Royal Castle.

In Germany, analogous vessels are known, inter alia, from Leipzig; they were studied and published by Ralf von Kluttig-Altmann, and are called "standing vessels" in his work. The author mentions that these large vessels could have decorative functions, standing in rows on large pharmacy shelves. The vessels from Leipzig are made of stoneware, their height is 12 cm or more, they are "conical or cylindrical" in shape (Klutting-Altmann 2006: 325).

The jars presented in Josef Horschik's book are also a kind of analogy. These are vessels of similar dimensions and shape to the jars from the Saski Palace. However, the decorations of these vessels have a different character (Horschik 1978: 326, 330, 332).

It seems, however, that the closest analogy to jars from the Saxon Palace are square glass bottles from the travelling pharmacy of Augustus II, precisely dated and inscribed with the "AR" monogram. The portable pharmacy was transported in five iron-reinforced chests, each almost one metre long; during transport they were supervised by the King's personal physician and a pharmacist (Syndram 1997: 369; Szelegejd 2007: 46). One of the sides the bottles is decorated with an enamel-painted royal coat of arms: a crowned ermine mantle with coats of arms of Poland and Saxony and the "AR" monogram of the ruler. Below, there is the date 1719 and a band with Latin names of medical products. The vessels from the collection of the Kunsgewerbesmuseum in Dresden and the National Museum in Warsaw bear the inscriptions: "AQV:CARD:BEN",[3] "OL:JUNIPER"[4] and "SP:TARTAR"[5] (Wolfgang-Hagen and Heinrici 1996: 34–35, Fig. 1, 2; Syndram 1997: 369, No. XI 67). Another similar glass bottle, currently in the collection of the King John III Palace Museum in Wilanów, bears the inscription "AQV:FUMAR",[6] which means that it contained a therapeutic extract of the common fumitory, *Fumaria officinalis* (Szelegejd 2007: 46–47).

These specimens are made of different material (glass), yet in terms of form and purpose they are closely related to the jars found in the Saxon Palace. They are also associated with the Saxon court. However, it should be noted that the above-mentioned glass bottles are more decorative; they had to be clearly marked to be easily recognizable as part of the travelling pharmacy.

A similar drug jar from the court pharmacy of another Wettin ruler – Augustus III (King of Poland between 1733 and 1763) – is now in the collection of the Smithsonian Institution in Washington (Roeske 1991: 170, Fig. 128). It is a cylindrical ceramic vessel decorated with painted coats of arms of Poland and Saxony with the "AR" monogram and the date 1734.

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3 *Aqua cardui benedicti*, i.e., blessed thistle water.

4 *Oleum juniperi*, i.e., juniper oil.

5 *Spiritus tartari*, i.e., tartaric acid.

6 *Aqua fumaria*.

INTERPRETATION

The excavated specimens are undoubtedly connected with a pharmacy. It may be assumed that the stoneware jars found in the Saxon Palace were used to store medicines, probably dry substances. This is indicated by the shape of the vessels, especially their mouths. Wide mouths made it easier to fill the jars with loose substances and measure required amounts of them. The material itself was equally important – stoneware is hard, impermeable and resistant to mechanical damage.

Ceramic pharmacy containers[7] had a similar shape. However, as pointed out by W. Roeske, they had a differently-shaped rim (straight) and were covered with a lid, whereas glass apothecary jars had a flaring rim, which made it possible to cover the containers with animal membranes, fabric or parchment (Fig. 2; Roeske 1973: 27).

The stoneware vessels from the Saxon Palace are medium-sized; their characteristic appearance (square cross-section) and large, legible royal monograms suggest that they had not only utilitarian functions, but could also have been used for decorative purposes.

The decoration and size of pharmacies changed in the early modern period. They no longer consisted of one room and became much more extensive: apart from the front (main) chamber, there were also other rooms, including a laboratory. In the front room, customers were served. It was also used to store and distribute ready-made medicines and various goods sold in pharmacies at that time (e.g., spices, wax, paper, wine). Therefore, these chambers had to be adequately furnished, e.g., with ornate storage vessels, which were displayed on shelves behind the serving counter, within sight of customers (Figs 3, 4; cf., Roeske 1991: 97–99).

As mentioned earlier, the jars from the Saxon Palace bear the royal monogram "AR" (abbreviation of "Augustus Rex"). Apothecary vessels were often decorated with the coats of arms or emblems of aristocratic families, customers of a given pharmacy; it enhanced the prestige of the pharmacist, boasting of a wealthy clientele (Roeske 1973: 10). However, in the case of the jars from the Saxon Palace, the crowned monograms were probably ownership marks: it may be assumed that the vessels were made by special order of the King. They presumably come from the pharmacy catering mainly for the ruler, his family and court, located on the premises of the Saxon Palace. This hypothesis is confirmed by the similarity of their form and decorative motives to glass bottles from the travelling pharmacy of Augustus II and to ceramic vessels from the pharmacy of Augustus III.

If the excavated specimens were made for a pharmacy located in the Saxon Palace in Warsaw, they were probably manufactured after 1724. It was only then that Augustus II and his court moved to the new residence; previously the King stayed at the Royal Castle in Warsaw (Borowska 2020: 44). It is less probable that they were manufactured after 1763 (the date of the death of Augustus III; Staszewski 1989: 277). At that

[7] Containers of other materials, e.g., wood, were also used.

Fig. 3 *The Apothecary*, Frans van Mieris, 1714, collection of the Amsterdam Museum. In the foreground, a jar covered with parchment or leather. Source: Wikimedia Commons, public domain.

time the palace changed its role. Although it remained in the hands of the Electors of Saxony, they used only a small part of the main building as an accommodation for their diplomatic and trade missions. The rest of the palace was divided into smaller sections, rented as offices and private apartments. It is possible that the pharmacy was still operating, but it is doubtful that new batches of storage vessels marked with the royal monogram were ordered for it (Borowska 2020: 114). In 1797, the palace was purchased by the King of Prussia, Frederick William II, and ceased to have a residential function. It appears that the pharmacy also ceased to exist at that time (if it had not been closed earlier, after the death of Augustus III).

The jars from the Saxon Palace, made at the request of the Wettin rulers of Poland, were probably manufactured in Waldenburg (a famous stoneware production centre

Fig. 4. *Country Pharmacy*, print showing French aristocratic customers at Michael Schüppach's pharmacy on the Dorfberg in Langnau in Switzerland. Author G. Locher (1774), engraver Bartholomäus Hübner (1775). Source: Wikimedia Commons, public domain.

in Baden-Württemberg) or in an unspecified manufactory in Saxony.[8] Waldenburg produced large stoneware vessels for pharmaceutical and chemical companies (see, for example, Kowalczyk 2014: 31).

Little is known about the pharmacy itself. Its existence is confirmed for example by a periodical published in the Polish capital at that time – *Gazeta Warszawska* (Gazeta Warszawska 1795, No. 10–12), which reported that it used to be located in the Saxon Palace (Wenda 1917: 23). It is also mentioned in *Materiały do dziejów farmacji w dawnej Polsce* (Świeżawski and Wenda 1887: 110). According to K. Wenda the

[8] Bernd Brinkmann, oral communication (October 24, 2020).

simultaneous existence of the Royal Pharmacy[9] in the vicinity of the Royal Castle in Warsaw (in the building beside the Cracow Gate) suggests that the pharmacy located in the Saxon Palace must have been a court (private) pharmacy of the Saxon Electors (Wenda 1917: 23).

Around 1719, Augustus II began to show alarming symptoms; the present state of medical knowledge makes it possible to interpret them – the King suffered from diabetes (Widacka 2010). He had a number of ailments accompanying this disease, so it can be assumed that he required medicaments and services of a team of medical professionals, including physicians and pharmacists. His travelling pharmacy contained the drug described as "AQV:CARD:BEN" (*Aqua cardui benedicti*), i.e., blessed thistle water made from the *Cnicus benedictus* plant. It was used as a supplementary medicine to cure fevers of unknown origin; it was recommended to "add a few drops [of it] to vodka" (Compendium Medicum 1725: 429). Tartaric acid was used to treat "the warming of the liver" (Compendium Medicum 1725: 268). Juniper oil was used, as it is today, as a disinfectant. Juniper oil might have been used to treat the left foot of Augustus II, gangrenous due to diabetes ravaging his body for many years (Widacka 2010).

The existence of a court pharmacy in the Saxon Palace is also confirmed by other archaeological evidence. Apart from the described jars, a set of standard, 18th-century glass apothecary vessels was excavated. They are bottles, jars and vials of various sizes and shapes (called *zakonniczki* in Polish archaeological studies) and an ampoule (Fig. 5; cf., Majewski 2018: 160).

Moreover, at the site of the Saxon Palace, a stoneware measuring vessel was found (Fig. 6; cf., Klutting-Altmann 2006: 324; Dąbal *et al.*, 2018a: 180, Fig. 2); stoneware mineral water bottles were also discovered (Fig. 7). A similar set of stoneware mineral water bottles from Höxter was described by Bernd Brinkmann (2020).

It remains an open question whether the pharmacy in the Saxon Palace served the royal court only. It is difficult to provide an unequivocal answer to this question because of the lack of relevant written sources. The Saxon rulers did not live permanently in Warsaw and visited the Polish capital occasionally (Żórawska-Witkowska 1997: 57–61). If the pharmacy had been open only during the presence of the royal court, it would be completely unprofitable. The Royal Pharmacy near the Royal Castle in Warsaw, apart from preparing medicines for the ruler and his court, also catered for other inhabitants of Warsaw and guests from outside the city. It is known for example from contemporary correspondence that Countess Elżbieta Sieniawska usually obtained medicines from the Royal Pharmacy in Warsaw (Łojek 1961: 46; Słaby 2014: 243).

It cannot be ruled out that the pharmacy in nearby Trębacka Street in Warsaw, which was still operating at the beginning of the 20th century and had a signboard

[9] For more about the excavations at the site of the Royal Pharmacy in Warsaw, see: Więcek E. 2017; Więcek M. 2017; Kozłowska and Nowakowski 1987.

Fig. 5. Selected glass vessels from the court pharmacy in the Saxon Palace in Warsaw. 1, 2 – bottles; 3 – ampoule; 4–8 jars; 9 – vial, so-called *zakonniczka*. Drawing by U. Skwara-Nieckuła.

Fig. 6. Stoneware measuring vessel found on the site of the Saxon Palace in Warsaw.
Photo by E. Więcek-Bonowska.

Fig. 7. Stoneware mineral water bottles found on the site of the Saxon Palace in Warsaw, height – 27–29 cm. Photo by E. Więcek-Bonowska.

"Pharmacy to His Royal Majesty's Court" was the legacy of the court pharmacy of the Saxon Electors (Wenda 1917: 23).

CONCLUSIONS

The number of Polish studies devoted to modern stoneware drug jars is limited. So far, mostly glass apothecary vessels have been discussed; ceramic containers related to pharmacy have rarely been researched. It is necessary to publish more newly-discovered material relics of modern pharmacy. The present article presents only a small fraction this subject, connected with a unique set of apothecary jars made specially for the royal Saxon court. The results, combined with those contained in previously published works devoted to the archaeology of pharmacy, will facilitate a more detailed analysis of stoneware apothecary jars in the city of Warsaw before the partitions of Poland.

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Historical and SEM-EDS Analysis of a 14th-16th Century Triangular Crucible from Sandomierz, Poland

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The collection of the District Museum in Sandomierz holds a previously unidentified and unpublished triangular ceramic crucible. After at least fifty years since its acquisition, it was possible to obtain detailed information about its chemical composition and presumed use in the past. Based on analogies from Central Europe, it is possible to date it typologically to the 14th-16th centuries. The stamp mark on the bottom of the crucible points to Tulln in Austria as the place of its origin. The SEM-EDS analysis revealed the presence of graphite in the ceramic mass of the vessel as well as carbon and iron compounds on its inner wall, which indicates its possible use in the production of steel by carburising of iron.

KEY-WORDS: crucible, post-medieval, graphite, iron, carburising, SEM-EDS analysis

INTRODUCTION

The aim of the work is to present a previously unpublished triangular ceramic crucible with a stamp (Fig. 1), kept in the collection of the Archaeological Department of the District Museum in Sandomierz. The vessel was acquired before the year 1970. It comes from Sandomierz, probably from the Old Town area. There is no detailed data concerning its discovery. In the museum inventory the crucible has the signature MS-1210/a. This specimen was initially believed to be a medieval vessel stove tile, and this paper is a consequence of its re-interpretation.

The vessel is 200 mm high with the side length of 160 mm, and measures *c.* 165 mm in diameter and 125 mm diameter at the base. The bottom is 30 mm thick and the walls

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Fig. 1. Triangular crucible from Sandomierz, Poland: a – The crucible in the collection of the District Museum in Sandomierz, b – Bottom of the crucible with the visible stamp. Photo by M. Banaczek.

at the spout are 19 mm thick. The crucible weighs 3.2 kg. Viewed from above, the vessel has an opening in the form of an equilateral triangle with slightly arced sides curving outside (Fig. 2). The rim is rounded, bending slightly towards the inside of the vessel. On the one edge of the spout (just by one of the corners of the triangular vessel) there is a shallow notch 30 mm long, made before the vessel was fired. The bottom of the vessel is flat, with a stamped mark resembling a coat of arms with St. Anthony's cross or the letter T (Figs 1b and 2). The mark measures 24 mm (height) by 21 mm (maximum width). On the inside, the bottom of the crucible is slightly concave-shaped. The rough and coarse outer surface of the crucible is reddish-brown in colour, while the interior is dark-red

Fig. 2. Ceramic crucible in the collection of the District Museum in Sandomierz (inv. no MS-1210/a), 14th-16th c. Graphic design by P. Werens.

and brown with much dark discolouration and a rusty coating visible in places. On the outer surface of the vessel, one can see cracks and multiple chips in the outer layer of clay. On the inner surface there are visible traces that it was thrown on the wheel. The crucible was made from clay containing iron compounds, thinned with a fine-grained temper of sand, and a coarser-grained admixture (rock pieces up to app. 2 mm in diameter) admixtures. Both the patchy colouring on the interior and the exterior of the crucible and its porous surface result from use and indicate contact with high temperatures.

ICONOGRAPHY

Representations of triangular crucibles can be found e.g., on the illustrations in the 16th-century works devoted to mining and metallurgy: *De Re Metallica* by Georgius Agricola (Agricola 2000: 212, 407) and *Beschreibung allerfürnemisten Mineralischen Ertzt, und Bergwercks arten, wie dieselbigen, und eine jede insonderheit, der Natur und Eigenschafft nach, auff alle Metale Probirt* by Lazar Ercker (1974: 49; Fig. 3). In 1872

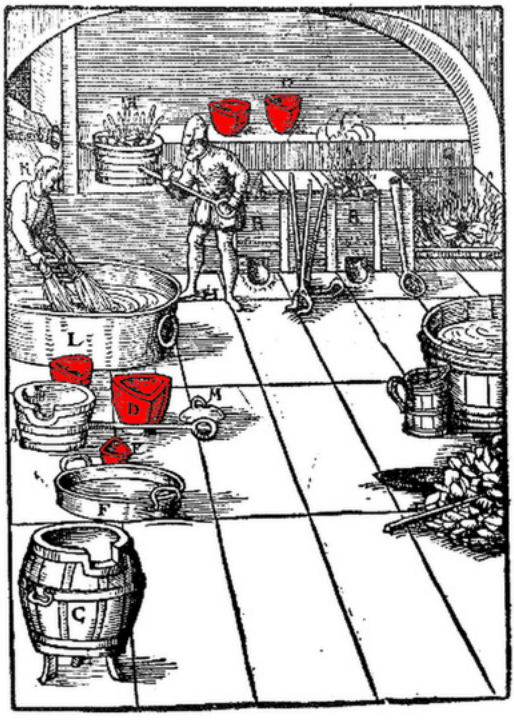

Fig. 3. Presenting the process of assaying the silver content (after: Ercker 1974: 49).

the reprint of the original work *Narrenschiff* by Sebastian Brant from 1494, an image of a crucible was included in the chapter entitled: *Von Falsch und Betrug* (Brant 1872: 266). We can also find them in two illustrations by Christoph Murer (Murer and Rordorf 1622: I, XIX) known as *Alchimia* and *Fidei Exploratio*.

ANALOGIES

In Poland triangular crucibles have been known from the research carried out in Krakow-Wawel (four small vessels found in post medieval layers in different parts of the Royal Castle and The Wawel Hill area; Lichończak-Nurek 2007: 417–418), Nysa – Królowej Jadwigi Street (four vessels found in a medieval well; Romiński 1972), Bytom (two vessels with no detailed information about place of discovery available; Romiński 1972: 73), the city moat in Wroclaw (Wiśniewski 1993: Fig. 11e) or the Market Square in Sieradz (Kufel-Dzierzgowska 2007: 38).

They have also been discovered in different regions of Central Europe. In Czechia they have been found in Prague - Nové Mesto (Cymbalak and Matějková 2012: 52, fig. 16), Olomouc (Nekuda and Reichertová 1968: 390, fig. LXXXV.1 - no detailed information about place of discovery available), as well as on four sites in Brno – Chorázova Street (Novotný 1964: 66; tab. 33), Dominikánská Street (Hložek *et al.*, 2004), Mečová Street (Gregerová *et al.*, 2011: 48) and in Náměstí Svobody (from the site of the former church of St. Nicholas; Novotný 1966: Tab. 23.8). In Austria, they have been discovered in Tulln an der Donau (Tulln-Bahnhofstraße; Cech 1989: 216, taf. 36) and the place known as *the Alchemist's Workshop* in Oberstockstall (Soukup and von Osten 1992: 12, fig. 1). At the latter site there were discovered an impressive number of about 280 triangular crucibles, of which, however, only 6 were similar in size to the crucible from Sandomierz (a group of the largest crucibles 170-185 mm high; Martinón-Torres 2005: 106, fig. 33). In Hungary, similar triangular crucibles have been found in Sopron (City Hall; Kugler 1901: 74), in the counterfeiter's workshop in the Szuhogy-Csorbakő castle (Varga and Nagy 2017: fig. 7), on two sites in modern-day Budapest: Hess András tér (Holl 1975: taf. 51, 52; Holl 1991: taf. 2.2) and in the Royal Castle (on the site of a presumed goldsmith's workshop, Holl 1991: 84, taf. 3.2).

The listed crucibles vary in sizes, with the height between a few centimetres and over 20 cm.

All the above-mentioned finds are dated to the period between the 14th and the 16th centuries, to a varying degree of certainty. The form of the vessels is dictated by their utilitarian function (Cech 1989: 178) and for this reason seem unlikely to vary in form chronologically. This means that it is difficult to date specimens devoid of their context on the basis of form. Examples of later triangular crucibles from Poland

(dated to the turn of the 18th and 19th centuries) are known from the Warsaw mint (Borowska 2012: 135, fig. 6) and from the site at 6 Świętojańska Street in Gdansk, where they were used for bronze casting (Dąbal 2018: 102).

T-MARK

The stamped mark on the bottom of the vessel (Figs 1b and 2) might help to establish the provenance of the vessel. Imre Holl presented a list of over 30 sites where various types of pottery with the above-mentioned mark were discovered. The majority of those sites was located in the vicinity to the Danube river along the section between Passau and Budapest (Holl 1975: taf. 54).

The stamp was present on different types of pottery found e.g., in Hungary (Budapest, Visegrad, Kőszeg, Sopron and Szuhogy; Holl 1975: 136–140), Slovakia (Bratislava; Habovštiak 1959: 466), Czechia (Prague; Cymbalak and Matějková 2012: 52; Brno; Novotný 1966: tab. 23.8) and Austria (Tulln an der Donau; Cech 1989: taf. 14, 36; Oberstockstall; Soukup and von Osten 1992: 12). Putting the stamp on vessels with diverse forms such as bowls, pots, jugs, crucibles, as well as tiles, indicates that the mark was not related to the function or size of the vessel. It should be interpreted as a signature of the workshop or a quality mark. Vladimir Nekuda and Květa Reichertová quote, after Alfred Walcher von Molthein, a regulation of the Vienna City Council from 1431 ordering potters to use a stamp to mark only the vessels with an addition of graphite (Nekuda and Reichertová 1968: 96).

The stamp found on the bottom of the crucible from Sandomierz is identical to the stamps interpreted as the signature of the workshop located in Tulln an der Donau in Lower Austria (Wiesinger 1937: 113; taf. 5.14–16; Holl 1975: 135, Martinón-Torres and Rehren 2009: 65; in the listed publications no precise data on the place of discovery). The coat of arms of the town of Tulln an der Donau still has a similar form representing the letter T inscribed within a shield (Ströhl 1904: 25; Taf. IV).

ANALOGIES OF CRUCIBLES WITH T-MARK

Similar finds of triangular crucibles marked on the bottom with a stamp, such as can be seen on the crucible from the collection of the District Museum in Sandomierz, were recorded during excavations at a number of sites in Central Europe. Possibly among the oldest were those found in the research conducted in the vicinity of the former church of St. Nicholas in Brno (Fig. 4b; items dated to the 14th-15th centuries; Novotný 1966: tab. 23.8). Others were found in Prague – Nové Mesto (Fig. 4a; vessels from the 2nd half of the 15th – 1st half of the 17th century; Cymbalak and Matějková

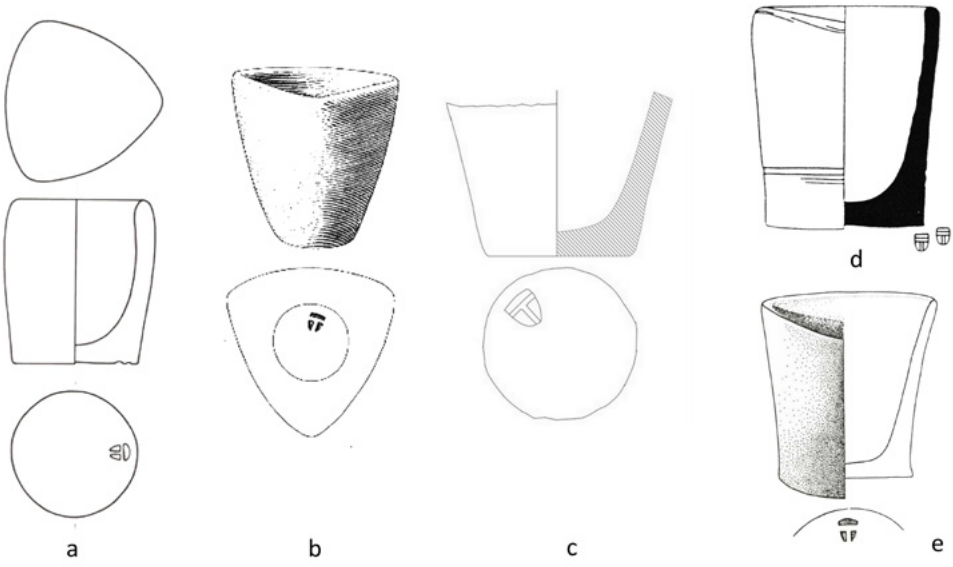

Fig. 4. Finds of crucibles with stamps in the shape of the letter T: a – Prague - Nové Mesto (Cymbalak and Matějková 2012: 52; Fig. 16), b – Brno - St. Nicholas church (Novotný 1966: Tab. 23.8), c – Tulln an der Donau - Bahnhofstraße (Cech 1989: 216, Taf. 36–P2), d – Oberstockstall (Soukup and von Osten 1992: 12, Fig. 1), e – Budapest - Royal Palace (Holl 1991: 90, Taf. 3–2). Various scales. Graphic design by P. Werens.

2012: 52, fig. 16). In Oberstockstall examples were found in the so called *Alchemist's Laboratory* (Fig. 4d; artefacts from the 16th century; Soukup and von Osten 1992: 12, fig. 1). Examples also came from: Tulln an der Donau (Fig. 4c; dated to the medieval -post-medieval period; Cech 1989: 216, taf. 36); Hess András tér (found in a cesspit) and the Royal Palace in Budapest (Fig. 4e; on the site of a presumed goldsmith's workshop, finds from the 14th-15th centuries; Holl 1975: taf. 51, 52; Holl 1991: 82, 84). A further example also came from Szuhogy-Csorbakő (16th century; Holl 1975: 138). The sites from which the finds originated are shown in Fig. 5.

INTERPRETATION

During the late medieval period and afterwards, triangular crucibles were produced in specialised pottery workshops, e.g., in Grossalmerode in Hesse or Obernzell in Bavaria (Martinón-Torres and Rehren 2009: 51, 60), as well as in numerous smaller workshops

Fig. 5. Map of Central Europe showing finds of triangular crucibles with a T-mark. 1 – Sandomierz, 2 – Prague, 3 – Brno, 4 – Tulln an der Donau, 5 – Oberstockstall, 6 – Budapest, 7 - Szuhogy – Csorbakő. Graphic design by P. Werens.

along the Danube associated with the centre in Bavaria (Martinón-Torres and Rehren 2009: 60), and possibly sometimes by metalworkers themselves (Agricola 2000: 213).

Mineral additions e.g., in the form of graphite were frequently used in their production process. The addition of graphite increased the vessels' resistance to high temperatures and chemical substances (Wałowy 1979: 72). However, the question of the source of graphite has not been fully explained. Nekuda and Reichertová (1968: 96) explain its presence as a result of it being imported by Viennese potters from the lands of Bohemia and Moravia. Miroslava Gregerová, Blanka Holubová Závodná, Martin Hložek and Rudolf Procházka (2011: 47) also maintain that material from the deposits located in Moravia was used in the production of graphite pottery vessels. Another possibility is offered by Marcos Martinón-Torres and Thilo Rehren (2009: 67), who suggest the use of clay naturally containing graphite.

A relatively limited number of published triangular crucibles might be the result of difficulties in identifying fragmentarily preserved vessels. But it can also be the consequence of their repurposing – damaged and broken vessels would be crushed and

then added to the clay from which new crucibles were made. Such an indication can be found in the treatise *Diversarum artium schedula* by Theophilus Presbyter (Teofil Prezbiter 1880: 137). Although it refers to earlier times (11th/12th century), a similar piece of information can be found in Agricola's text (Agricola 2000: 213), thus confirming that damaged but high-quality vessels with the addition of the rare mineral were also re-used in the production of new crucibles between the 14th and 16th centuries. In the same place, Agricola describes forming the vessels in brass moulds with the use of special brass pestles. In some crucibles one can see traces of their being wheel-thrown (Lichończak-Nurek 2007: 417); according to Martinón-Torres they had been thrown on the wheel and then their spouts were given a triangular shape (Martinón-Torres and Rehren 2009: 50, 54, 60). The temperature of firing was to exceed between 950° C and 1050° C (Martinón-Torres 2005: 111).

Triangular crucibles were almost entirely used for the carrying out various processes related to obtaining and processing metals and were used by:

a) metallurgists, e.g., for smelting ores and melting copper (Agricola 2000: 209, 210), silver (Agricola 2000: 366) and perhaps iron (Wałowy 1979: 73), as well as for producing crucible steel (?; Agricola 2000: 384), and carrying out assaying processes (Agricola 2000: 221, 222, 225, 228);
b) goldsmiths (e.g., Holl 1991: 82, 83–84; Hložek *et al.*, 2004: 304);
c) in minting coins (Agricola 2000: 230; Martinón-Torres and Rehren 2009: 60) and by coin counterfeiters (e.g., Varga and Nagy 2017);
d) alchemists (e.g., Brant 1872: 266; Murer and Rordorf 1622: I Alchimia, XIX Fidei Exploratio; Soukup and von Osten 1992);
e) and apothecaries (e.g., Lichończak-Nurek 2007: 417, 418).

Because there is no information concerning the place and circumstances in which the crucible was discovered, placing the find in a historic context is a difficult task. Archaeological sources do not offer any more precise data concerning metallurgical production in the Sandomierz area during the 14th-16th centuries. Within the settlement on the site Sandomierz – Collegium Gostomianum, dating back to the 11th century, traces of iron processing in the shape of numerous lumps of iron semi-product and slag have been discovered. Additionally, one of the features discovered on this site was associated with iron production. Slag and iron sponge were also found during the research conducted in the settlement on St James' Hill (Wzgórze Świętojakubowe, a.k.a. Staromiejskie) dated to the 12th century. Moreover, parts of a smith's tongs were discovered within one of the dwelling features here (Tabaczyński and Buko 1982: 151–152).

Another vessel in the collection of the museum in Sandomierz, also interpreted as a crucible, comes from the same site. It was probably discovered during the inter-war period and there is no detailed data about its acquisition. The vessel is dated to the early-medieval period, has a pot-like shape and rather small dimensions (height:

52 mm, diameter: 80 mm). The excavations carried out on Wzgórze Staromiejskie in 2015, revealed an 11th century complex of features probably functioned as a metallurgical workshop, where lead and silver were produced and processed (Florek and Stempin 2015: 56).

Historical sources (primarily town records and church registers) are more helpful in researching the period from the 14th to the 16th centuries in this respect. Thus we know that already in the 15th century a guild of metalsmiths existed in Sandomierz (Kiryk 1994: 121). In the 2nd half of the 16th century, several dozen metalworking workshops of craftsmen such as: blacksmiths, swordsmiths, clock-makers and goldsmiths, as well as casting workshops, are believed to have functioned in the town. At that time, metalworking artisans seem to have constituted the majority of the residents in Opatowska Street (Kiryk 1993a: 23). Although Sandomierz was not numbered among major metal production centres, it nevertheless constituted an important centre for manufacturing knives, swords and also possibly armour (Kiryk 1993b: 87–89).

The discovery of the discussed crucible might have been related to that latter branch of metalworking. It should also be emphasised that the 2nd half of the 16th century was a period of intensive development of forges at multiple sites across Poland, notably about half of their overall number were located in Lesser Poland, concentrated especially in Sandomierz Voivodeship (mainly in the Świętokrzyskie [Holy Cross] Mountains region; Wyrobisz 1978: 151). The iron obtained in them as a result of the bloomery process was of poor quality; the exception was the so called 'dul', i.e., iron carburised to a lesser degree than steel (Wyrobisz 1978: 147).

The predominant – or even the sole – method of obtaining steel by means of carburising iron employed in Poland until the 16th century was the method which involved roasting iron objects in charcoal dust without an air supply (detailed information on this process in the publications quoted, see e.g., Zientara 1952: 239; Piaskowski 1960: 130–132). The process, currently known as solid (or pack) carburising, is conducted at the temperature of 900–950° C and it allows for obtaining a carburised surface layer with 1% concentration and 0.5–2.5 mm thick (Przybyłowicz 1999: 276–279). In the 16th-century work by Giambattistaa della Porta, entitled *Magiae naturalis* we can find the instruction for hardening the *habergeon* using the above-mentioned process, carried out in a tightly sealed ceramic vessel with an addition of a powder made by mixing dried oxen hooves, salt, crushed glass and soot (Porta della 1658: 307–308). The oxygen supply could have been limited by shutting the crucible with a lid, such as an upturned scorifier (Martinón-Torres 2005: 118). In light of the SEM analysis results, it seems that one of the most likely hypotheses concerning the use of the described crucible is using it as a container in which the above described case hardening process was carried out.

SEM-EDS ANALYSIS

The aim of the SEM-EDS analysis was to determine the content of the ceramic mass of the vessel, and acquire information concerning possible substances traces of which might have remained on the inner sides of the crucible when it was used. Four samples were collected from the crucible in order to analyse the elemental composition and on this basis assessing the chemical content. Analyses were carried out using the scanning electron microscope (SEM) in the laboratory of the Department of Materials Technology and Chemistry at the Faculty of Chemistry at University of Lodz.

The samples were taken with a steel chisel, which was used to remove surface fragments measuring app. 5 mm × 5 mm from the vessel. Operating conditions for SEM-EDS data collection were as follows: working distance of 5 mm; an accelerating voltage of 15kV; spot size of 3.8 to 5.8; live time of 100 seconds. In order to permit consistent comparisons, images of all the specimens were routinely taken at 650 × magnification.

The fragments of the triangular ceramic crucible were analysed using scanning electron microscopy (SEM; FEI, NovaNanoSEM 450), with a microscope operating at the accelerating voltage of 15kV and using the ETD detector. The elemental analysis was carried out using energy-dispersive X-ray spectroscopy (EDS). On the basis of the collected spectra and quantitative analysis, the chemical content of the examined ceramic material was estimated.

Four fragments of the vessel were collected for the analysis: Sample 1 was collected from the outer wall surface, i.e., the original surface of the vessel; Sample 2 was collected from the outer wall surface, i.e., the previously damaged spot; Sample 3 was collected from the inner wall surface, i.e., from the original interior surface of the vessel covered with a yellowish coating; Sample 4 was collected from the interior surface of the vessel bottom, i.e., the original inner surface of the vessel bottom covered with a rusty-coloured coating. The results of the analysis are presented in Table 1.

The analysis of the undamaged exterior wall (sample 1) carried out in two spots (spot 1 and 2) indicated that in both places the pottery mass has a similar content and consists mostly of silicon and aluminium, so its content is typical for a pottery mass based on ferric clay. Moreover, carbon was discovered in both spots (spot 1). However, the chemical content of the material collected in the previously damaged spot (so analysed material from deeper layers of the vessel – sample 2) shows more diversity. In the first analysed spot (sample 2 – spot 1), just like in the first sample, silicon, aluminium and iron are predominant with an admixture of sodium, potassium and magnesium. However, in the second spot (sample 2 – spot 2) the carbon content was only discovered in the form of a large patch having the size of several hundred micrometres. The obtained chemical content and the topography of SEM images suggests that it most likely is carbon in the form of graphite (or another form of carbon) visible in a SEM photograph as a dark area. This is also confirmed by the

Table 1. The approximate chemical composition of the ceramic crucible made using the SEM-EDS.

Sample	**Content [% wt]**									
	Si	Al	K	Na	Fe	Ca	Mg	P	C	O
1 spot 1	11	6	1	-	3	3	-	-	25	51
1 spot 2	10	5	2	-	3	-	-	-	44	36
2 spot 1	27	12	2	1	4	-	1	-	-	53
2 spot 2	-	-	-	-	-	-	-	-	100	-
3a spot1	39	2	-	-	-	-	-	-	-	59
3a spot2	2	1	-	-	2	4	-	-	63	28
3a spot3	17	8	2	-	1	-	2	-	11	59
3b spot1	-	-	-	-	-	-	-	-	100	
3b spot2	-	-	-	-	69	-	-	-	-	31
4a spot1	2	1	1	-	11	2	-	1	68	14
4a spot2	-	-	-	-	-	-	-	-	100	-
4a spot3	2	2	-	-	53	4	-	2	-	37
4b spot1	-	-	-	-	-	-	-	-	100	-
4b spot2	1	-	-	-	88	1	-	-	-	10

layered structure of carbon patches with flakes peeling off visible in SEM images (Fig. 6). The lighter area is rich in iron.

Because of the considerable difference in the structure of the inner walls they were analysed twice, i.e., two separate areas on the surface of each sample were analysed, and each of them was also analysed in 2–3 spots. The diverse composition is already clearly visible in the first analysed area (3a – Table 1) where, depending on the analysed spot, one can see the presence of silicon with an addition of aluminium (3a spot 1), or one can observe the presence of silicon, aluminium, iron and calcium in comparable amounts, as well as a very high carbon content (3a spot 2). On the other hand, in the third analysed spot of that area, silicon and aluminium are predominant again, but additionally there are also potassium, magnesium as well as carbon (3a spot 3). The considerable diversity in the chemical composition was also confirmed by the analysis of the second area (3b), which revealed that it consists of two patches containing only carbon (3b spot 1) or a large amount of iron (3b spot 2).

The analysis of another sample (sample 4) collected from the inner section, which was also analysed in two areas, seems very interesting. It was found out that particularly

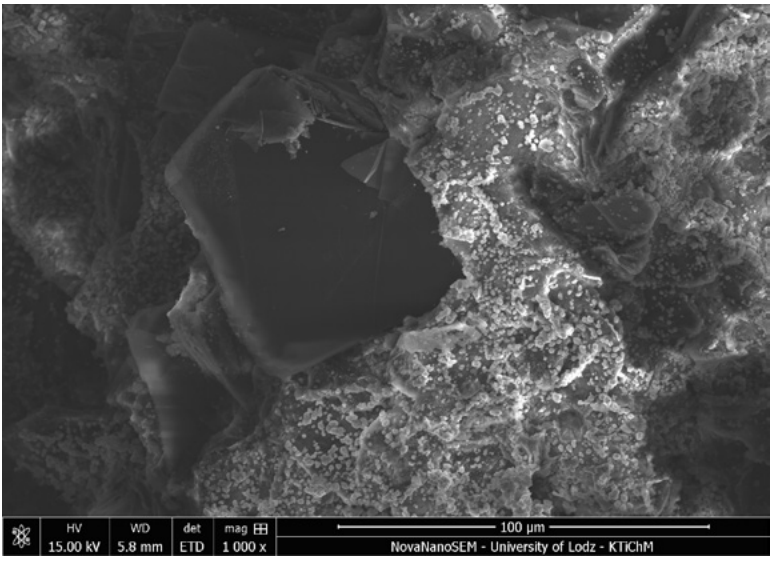

Fig. 6. SEM image of the surface of the sample collected from the inner surface of the ceramic crucible (sample 2 – spot 2). Photo by I. Piwoński.

iron is present here (4a spots 1 and 3), while other elements (silicon, aluminium and calcium) occur only in small amounts. There is also a high content of carbon (sample 4 spot 1) and patches containing only carbon (4a spot 2). Phosphorus was also found within the analysed area. If we connect both facts, i.e., the occurrence of iron and phosphorus, we can speculate that the vessel was used for smelting or processing of iron from ores containing iron phosphates such as e.g., vivianite. In Poland, vivianite can be found in bog iron ores (Wiwianit 1969: 369) which, in the 16th century, must have been the basic raw material used in the iron production process carried out in the above mentioned numerous forges located in Sandomierz Voivodeship (Ratajczak and Rzepa 2011: 26). However, the concept of using the crucible for iron smelting seems to be contradicted by the lack of traces of slag on the walls of the vessel.

Naturally, another provenance of the phosphorus compounds cannot be ruled out. Characteristic patches consisting solely of carbon (4b spot 1) or mainly iron (4b spot 2) were also observed in the second analysed area (sample 4b). The data seem to confirm the possibility of using the crucible in the process of pack carburising/case hardening of iron. In that case another explanation for the presence of phosphorus compounds in the analysed sample could be considered, namely that phosphorus compounds were deliberately added during the carburisation process in order to deepen it (Widanka 2010: 85). Alternatively, the presence of metallic iron may have resulted from the process

of iron reduction in situ by the action of carbon (from the decomposing graphite) from iron oxides naturally present in the ceramic fabric. A similar phenomenon in other graphite crucibles that were used for silver processing, (i.e., nothing to do with iron metallurgy) was noted e.g., in crucibles from the Convent of San Domenico in L'Aquila (Martinón-Torres and Verrocchio 2008: 107).

The research revealed the presence of iron both in the exterior and the interior wall of the vessel, though their amounts differ considerably from each other. On the one hand, it indicates the use of clay with ferric admixtures; while on the other, it proves that after firing, the vessel was in contact with iron compounds during unidentified technological processes. The rusty residue on the inner wall of the crucible may have resulted from adding iron filings to the ore of the analysed metal (Agricola 2000: 225) or smelting pyrite (Agricola 2000: 367). Ercker describes a method of assessing the silver content in iron ore (Ercker 1974: 58) by melting its filings with sulphur. A similar "faint rusty residue" can be found on the inner walls of the crucibles from Nysa (Romiński 1972: 80); the presence of a "thin layer or corrosion" on the crucible from Prague was also confirmed by Tomasz Cymbalak and Kristýna Matějková (2012: 55).

The analysis revealed that the ceramic surface of the examined vessel contains mainly silicon and aluminium commonly found in clay. The presence of other elements sporadically appearing in various spots of the analysed vessel suggests that the vessel was made from clay of varying chemical composition, perhaps obtained from various sources. Carbon was certainly added to the ceramic material, because its presence in the form of large patches was confirmed in both the outer and the inner wall. The research results suggest that it might be carbon in the form of graphite or charcoal or another form (amorphous carbon, soot etc.). It was also observed that the iron content was much higher in the samples collected from the inside section of the ceramic crucible, which might imply that it was used in processes involving that metal. A considerable amount of phosphorus might indicate the processing of iron with a high content of that element, or of phosphates which might have been admixtures required in the processes carried out with the use of the crucible.

CONCLUSIONS

The ceramic crucible in the collection of the District Museum in Sandomierz is one of few vessels of this type found in Poland. Based on analogies, its origin can be dated to the period from the 14th to 16th centuries. The mark found on its bottom indicates Austria as a probable place of its origin. Identification of the artefact was possible primarily owing to its well-preserved condition. However, the lack of archaeological context makes it impossible to link it more closely to a probable workshop or an individual working in Sandomierz during the late medieval to post-medieval period.

The SEM-EDS analysis allowed the determination of the approximate chemical composition of the surface of the ceramic crucible. A high carbon and iron content was also determined. The analysis results indicate that graphite was added to the clay mixture, while the vessel itself might have been used in steel production or for conducting other processes requiring the use of iron compounds. Further research is needed to confirm the full chemical composition of the triangular crucible analysed in the current paper.

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Current State of Knowledge of the Development of Early Modern Ceramics in the Czech Republic

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This study is an overview of the professional interest in archaeology of the modern age in the Czech Republic. Increased interest in the archaeology of the Modern period came after the year 2000. The number of published Early Modern pottery assemblages has increased significantly over the past decade. Recent years have seen a change in the publication strategy of Modern period assemblages. As such, the large Modern period find inventory is forcing archaeology to make a critical selection of assemblages which will subsequently be the subject of detailed processing and evaluation. The most important selection criteria include the complexity of the find situation, the possibility of placing it into the social context or the actual expansion of knowledge of period material culture.

KEYWORDS: Czech Republic, Early Modern period, ceramics, chronology, stove tiles, conference

INTRODUCTION

The first definition of post-medieval – Early Modern period – archaeology in Czech Republic was advanced by Z. Smetánka and J. Žegklitz (1989: 728; Smetánka and Žegklitz 1990: 7), who stated that post-medieval archaeology involved the period between the turn of the 16th century and the end of the 18th century. Based on the study of pottery from Prague, Pavel Vařeka established the transition from late medieval to Early Modern pottery in the period between the turn of the 16th century up to the middle of the 16th century (most recently Vařeka 2013: 8, 9). In general, this was the period marked by the disappearance of late medieval traditions and the emergence of Early Modern innovations. From a historical perspective, this was the

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Renaissance period in Bohemia and Moravia.[1] The widely accepted dividing line between the Early Modern and Modern periods is the mid-17th century, a boundary that was established on the basis of the widespread social changes that occurred in society following the Thirty Years' War (1618–1648), the consolidation of Habsburg power and from the perspective of the cultural ascent of the Baroque. Although this is a building style, there is a noticeable change in the taste of the inhabitants and in the objects of common daily use, i.e., the "Baroque-isation" of pottery and glass forms and the method of decoration. The period of 1800–1900, referred to as the Industrial Age typically focuses on monuments associated with the Industrial Revolution. It is characterised by the emergence, and especially the spread, of ceramic materials such as creamware and porcelain and the massive production of stoneware mainly as packaging for mineral water. The Industrial Revolution in general led to an increase in ceramic production. In recent years, the archaeology of the Modern past – contemporary archaeology (Tab. 1) – has developed very successfully with a focus on the research of not only threatened, but often also non-endangered sites (Krajíc *et al.*, 2017: 374).

Over the past 15 years, several authors have tried to describe and evaluate the development of Modern period archaeology; the earliest summary was compiled by Rudolf Krajíc (2007). The state of research in the field of Modern period archaeology was evaluated by the author of this study in her dissertation (Blažková 2011: 6–15), which became the foundation of a subsequent publication (Blažková 2013: 183–186) and, simultaneously, inspiration for the study by J. Žegklitz (2013). An updated overview of the state of research of Modern archaeology in the Czech Republic was published in connection with the international *Archaeologia historica* conference. In all these studies, the beginnings and subsequent development of Modern archaeology in the Czech Republic are described in varying degrees of detail,[2] which can be marked in terms of methodological approach to historical archaeology.[3] At the same

[1] Historical research also divides the Modern period into two stages: the term "Early Modern period" is used for the period of 1500–1650, the "Modern period" for 1650-1790/1800 (Petráň *et al.*, 1995: 31). The beginning of the Early Modern period then approximately overlaps with the beginning of the Renaissance (Bůžek *et al.*, 2007: 44).

[2] The scope of this text is limited by the space available. For this reason, citations are restricted mainly to works published in the last six years and the comprehensive studies containing more extensive bibliographies and which were of fundamental importance for the constitution of the archaeology of the Modern period. These publications can be used to supplement the information and especially the links to earlier publications.

[3] Historical archaeology has a quite clear conceptualisation in the United States and Great Britain. Many definitions set different priorities, there is basically agreement that historical archaeology begins with the modern era, or with the European global expansion. Besides this chronological approach, it also incorporates information from written records, pictorial sources, and oral history. Historical archaeology is therefore predicated on this interdisciplinarity between archaeology, the study of written and pictorial sources, oral history, and anthropology (Mehler 2013: 18).

time, it should be mentioned that no study has yet been published that would deal in detail with the integration of Czech post-medieval and modern archaeology into a theoretical framework.[4]

POST-MEDIEVAL ARCHAEOLOGY UP UNTIL 2000

Early interest in Modern pottery finds can be connected with the architect Jiří Koula, who studied slipware. In his analysis of Prague finds, Koula showed extraordinary erudition and intuitively formulated working hypotheses (Koula 1917–1919), the validity of which was fully confirmed by later research. His contemporaries dealing with the issue of Modern ceramics were the museologist Kliment Čermák and the archaeologist Emanuel Leminger. The work of the potter and collector Heřman Landsfeld and the ethnographer and archaeologist Karel Černohorský are also important, especially for Moravia. A more broadly conceived interest in the post-medieval period is connected with the post-war development of medieval archaeology. Since the end of the 1960s, there was a gradual increase in published assemblages with a post-medieval theme, though these still could be numbered in the single digits. A key figure of this period was the archaeologist and ethnographer Vladimír Scheufler, who was the first to attempt to establish a border between the spheres of interest of archaeology and ethnography (Scheufler 1972). And yet, he did not use the term "Early Modern pottery". For Scheufler, the period between 1550 and 1650 was a transitional time between medieval and folk ceramics (Scheufler 1972: 13), or between folk and stylistic/non-folk ceramics. He also closely collaborated with the foreign archaeologists, ethnographers, pottery collectors and potters who, in 1968, founded the *Internationales Hafnerei-Symposium* (IHS), later renamed *Arbeitskreis für Keramikforschung* (AfK),[5] and whose annual professional meetings he regularly attended, ending in the 1970s. As such, he was often the only representative from Czechoslovakia who had the opportunity to be in personal contact with colleagues and follow current research issues.

The analyses of the find assemblage from Strážnice by Jiří Pajer rank among the most heavily used works on Early Modern ceramics to this day (1982; 1983). Pajer later built on these analyses with his processing of Anabaptist faience from Strachotín (Pajer 2001) and he summarised the activities of Anabaptist potters in south Moravia in later publications (e.g., Pajer 2006; 2007).

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[4] For a attempts of conceptualization the origins, academic parameters, and practical fields of activity of historical archaeology in Central Europe, see Mehler 2013, Schreg 2013.

[5] *Arbeitskreis für Keramikforschung* (AfK) continues to host professional symposia today (Okmhb.de 2021). The 52nd *Internationales Keramik-Symposium* was held in September 2019 in Bad Muskau, Germany. The 53rd annual symposium was cancelled in 2020 due to the COVID-19 pandemic.

The *Working Group for the Archaeology of the 16th–19th Century* was established in the mid-1980s (Krajíc 2007: 58) and the outcome of their efforts was a seminar devoted to Modern period archaeology held in Beroun in 1986; one of the results of this seminar was the publication of presented contributions (Studies 1990). At the same time, the thematically focussed meeting was an impulse for a special publication of Modern period find assemblages (e.g., Frolík *et al.*, 1988). Although the growth in construction activities and the overall change in the social climate in the 1990s marked the end of the working group's activities, this did not mean the complete end of publications of Early Modern pottery assemblages. One of the most important works from this period is the publication of a waste assemblage from the house of the beltmaker Prokop of Tábor (Krajíc 1998) and the full processing of material from several plots from medieval Most, including the Early Modern parts of the find assemblage (Klápště 2002).

POST-MEDIEVAL ARCHAEOLOGY AFTER 2000

Increased interest in the archaeology of the Modern period came after the year 2000, a fact undoubtedly related to the establishment of new departments and institutes of archaeology in several Czech universities (Opava, Plzeň, České Budějovice, Hradec Králové, Pardubice). Apparent at the beginning of this period is an effort to establish post-medieval archaeology as a fully-fledged archaeological discipline. Two basic facts surface in the published works: the first is an attempt to defend the significance of the publication of a given assemblage, while the second is the need to deal with the method of processing typically very large pottery assemblages, which, however, does not always lead to the desired goal (e.g., Marešová 2001). As such, significant space is devoted to the method of description and statistical evaluation of the assemblage (e.g., Dohnal and Koucký 2000; Dohnal *et al.*, 2001; Dohnal and Vařeka 2002). Playing an important role during this period have been studies by the ethnographer Vítězslav Štajnochr (2004; 2005; 2006; 2007; 2008) on Modern pottery forms in terms of their functional use.

The number of published Early Modern pottery assemblages has increased significantly over the past decade, with an important role for an understanding of pottery production being played by assemblages from waste pits at Prague Castle (Blažkova and Vepřekova 2015; Blažkova *et al.*, 2016). A morphological analysis has made it possible to create a chronology of the development of Early Modern pottery in Prague (Blažková 2013; 2018; Blažková and Žegklitz 2016). These assemblages became the basis for the publication of Early Modern assemblages from various parts of the Czech Republic, not only in chronological but also methodological terms. One example is the publication of pottery production from south Bohemia (Čapek and Preusz 2019a). On the other hand, the publication of finds from northeast Bohemia does not deviate from the methodology applied in the first decade of the 21st century (Drnovský 2018).

However, unlike that decade, recent years have seen a change in the publication strategy of Modern period assemblages; these are typically from waste pits that have produced both reconstructable ceramic and glass vessels, the processing of which can expand existing knowledge of everyday material culture. As such, the large Modern period find inventory is forcing archaeology to make a critical selection of assemblages that will subsequently be the subject of detailed processing and evaluation. The most important selection criteria include the complexity of the find situation (Čapek and Militký *et al.*, 2016), the possibility of placing it into the social context (Cymbalak and Matějková 2012; Cymbalak *et al.*, 2019; Čiháková and Müller 2013) or the actual expansion of knowledge of the material culture of the period (e.g., Matějková 2017).[6]

The establishment of post-medieval archaeology has generated several sub-topics that are identical to issues being addressed across Europe, with one of these being the subject of slipware. In the Czech environment, this is mainly painted products from 1550 to 1630 that associated for many years with Beroun.[7] Under the influence of the written records, certain finds of material culture were connected with Beroun by amateur archaeologist and architect Jan Koula as early as the beginning of the 20th century (Koula 1917–1919, 250–257). Beroun pottery again received attention in the 1980s (Matoušek and Scheufler 1983; Matoušek *et al.*, 1985; Žegklitz and Zavřel 1990). Thanks to new field research, this issue was reopened directly in Beroun (Vyšohlíd 2015a), in Prague (Žegklitz 2015) and, at the same time, in connection with the processing of finds from Prague Castle (Blažková 2019). The Early Modern slipware from Bohemia corresponds to the European standards of this time, both from the perspective of ceramic forms and the method of decoration. It used double firing and not very hard-fired thicker body of red colour as for German *Werraware* (Stephan 1987: 101; 1992; 2012). Pottery forms include common kitchen ceramics and tableware, miniature vessels (toys) and objects primarily serving as decoration, such as bowls on an openwork foot. Beroun ware is similar to the finds of northern Germany style slipware (Gaimster 2006; Witte 2014), from Straubing in Bavaria (Enders 1982: 23, taf. 17/32; 1990: taf. 15–17; 2005: 32, 33, taf. 2.1, 2.2, 7.1), from Saxony (Krabath 2012: 75–79).

In contrast, attention is newly being paid to the continued use of painted decoration in the second half of the 17th century (Matějková 2019). Another Europe-wide subject is the study of pipes, artefacts that have been the focus of the work of Martin Vyšohlíd in the Czech Republic for many years (Vyšohlíd 2011; 2014; 2015b).

The growth of published collections has allowed archaeologists to pay close attention to specific types of ceramic production, including its integration into at least

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[6] That no references are provided to articles that were published in the anthologies of the *Forum Archaeologiae Post-Mediaevalis* conference is intentional (Studies 1990; 2007; 2009; 2012), as these publications are directly thematically focused on the issues of the Early Modern period.

[7] Beroun is located roughly 40 km southwest of Prague.

the Central European context. These are most often specific ceramic products with a clear use, i.e., distillation ceramics (Blažková *et al.*, 2021), flowerpots (Matějková 2012; 2021) or pottery kilns (Čapek and Preusz 2019b).

STOVES TILES

Stove tiles make up a distinct group of pottery finds; the terminology used to describe them was defined by Zdeněk Smetánka (1968; 1969) and is used to this day. The 1980s and 90s are linked primarily to the work of Zdeněk Hazlbauer (1998), who, working with a wide range of archaeologists and museologists, attempted to map stove tile production from the Gothic period to the Baroque for the entire Czech Republic. Hazlbauer's work became the basis mainly for the processing of vast museum collections.[8] Not only thanks to their attractive design, the Gothic and Renaissance stove tiles are a popular object of interest for archaeologists, both in museum collections and find assemblages. A detailed study of the design of the front heating wall with relief decoration makes it possible to create a relatively accurate chronological classification of specific tiles, even on the basis of the identification of the prints that served as their model. The scope of some studies goes beyond the prevailing narrow focus on typology or iconography and seeks to emphasise more generally conceived cultural and historical issues (e.g., Žegklitz *et al.*, 2009; Žegklitz 2011; 2012).

A summary of the current state of knowledge of stove tile production, including a high quality publication, was made possible by two thematic exhibitions devoted to tile production from the High Middle Ages to the Modern period. The first exhibition was held at the Regional Museum and Gallery in Most in the first half of 2018 (Šrejberová 2017; 2018). The outcome of the processing of the extensive find inventory from the rescue archaeological excavation on Republic Square in Prague by J. Žegklitz was the exhibition *To Špaček for a Stove*, held by the Museum of the Capital City of Prague and the company Archaia z.ú. from May 2019 to March 2020 (Žegklitz 2019).

ARCHAEOMETRY

Learning about ceramics from an archaeological perspective on the basis of macroscopic observations has its limits. Efforts have been made in recent years to solve this problem in cooperation with analytical chemists. In the case of selected assemblages, attention has been paid to analyses of the ceramic body, glazes and even the degradation of the

[8] A comprehensive list of works dealing with the topic of Gothic and Renaissance stove tiles, including publications by Z. Hazlbauer, was most recently presented by J. Žegklitz (2019).

pottery in connection with their deposition and the impacts of the surrounding environment. Today, many analytical methods common in material research are applied: for identifying the chemical and mineralogical composition, these are mainly X-ray methods (XRF, XRD) supplemented with microscopy (optical OM, electron SEM); still others are thermal analyses (DTA, TG, STA), spectroscopy of vibrational spectra (IR, RS) and Raman spectroscopy (e.g., Čapek *et al.*, 2018; Kloužkova *et al.*, 2020).

CONFERENCE

Communication and the sharing of experiences in the discipline are an integral part of professional work. The need for regularly organised personal meetings was the motivation behind the establishment of the *Forum Archaeologiae Post-Mediaevalis* international conference. The initiator and main organiser of this event was J. Žegklitz. A total of five conferences were held biannually starting in 2006, with the last event being held in 2014. Three extensive anthologies of articles reflecting the current state of Early Modern research in Bohemia and beyond were published (Studies 2007; 2009; 2012). In 2016, the 48th *Archaeologia Historica* international conference on medieval archaeology, which was held in České Budějovice, was devoted to the issue of post-medieval archaeology (AH 2017). The need for regular meetings of scholars studying similar subjects led to the organisation of the international conference entitled EUROPA POSTMEDIAEVALIS 2018, Post-Medieval Pottery Between (Its) Borders in Prague in 2018, followed by the publication of the presented articles (EP 2019). Although the second conference in 2020 could not be held due to the worldwide COVID-19 pandemic, an anthology of articles was published in 2021 (EP 2021).

CONCLUSION

More than a century has passed since the publication of Early Modern painted potsherds by J. Koula. Since then, hundreds of Modern ceramic assemblages and contexts have been published and a chronology of individual periods has been established. The increasing number of published assemblages has meant regular corrections in the dating of ceramic production and at the same time it is a prerequisite for larger comparative studies, which will compare ceramic production not only within a specific region, but between them. In cooperation with natural scientists, the range of addressed issues is constantly expanding and creates new topics of research. In general it can be said that Czech archaeology of the Modern period is today a firmly entrenched discipline and an integral part of European research and reflects a modern methodological approach of historical archaeology.

Table 1. Chronology of archaeology of the Modern age in the Czech Republic.

Early Modern Age	1400/1500–1650
Modern Age	1650–1800
Industrial Age	1800–1900
Contermporary Achaeology	after 1900

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A Unique 14th Century Seal-Matrix from Giebło, Zawiercie District[1]

Leszek Krudysz[a]

A unique lead seal-matrix with majuscule legend: LUCIANI PRESBITERI belonging to a priest was found by the Romanesque castle church in Giebło. The name of its owner is mentioned in written sources from the years 1325–1327 as *plebanus ecclesie de Kebel*. As PRESBITER he probably didn't enjoy all privileges that the collator usually bestows on a parish priest on his property. Possibly for that reason he had his matrix made in an easy-to-process material, infrequently used for such objects in this part of Europe. The use of this raw material suggests someone who tried avoid the high costs of making the item.

Special attention is merited by the composition of a *fleur-de-lis* crowned with the cross engraved on the seal face that resembles a heraldic device. The repetition of a schematic lily flower on the reverse of the matrix shows the special importance of this sign (identified in medieval time with the Blessed Virgin Mary); this symbol was treated in this way by, for example, Cistercians. By presenting his name in the company of these symbols, Lucianus gave his seal strength and credibility.

KEY-WORDS: Giebło, Cracow-Częstochowa Upland, Romanesque castle church, lead seal-matrix, *fleur-de-lis*, gothic majuscule, presbiter Lucianus, heraldic signs

INTRODUCTION

A seal is a sign that authenticates a written message, sometimes used to protect valuable items, an idea well known already in the Near Eastern civilizations. Quite early on, the owner's name began to be placed on them and thereby the seal matrix was a kind of identifier, and at the same time it could have served as a talisman since mythological creatures and deities were often engraved on them (Przeworski 1938: 75; Grant 1991: 128; Ameri *et al.*, 2018).

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Among the peoples of early medieval Europe, unfamiliar with writing, seal impressions evoked a pious reverence towards the mystery protecting the document, which placed both the seal and the document in a sphere outside reality. This impression was probably sometimes even more important than the content of the script (Bresslau 1958: 689 ff; Mikucki 1960: 12; Szymański 1981: 47).

At the dawn of the middle ages, wax and metal were in use for sealing. For example, the papal chancery used bullae – metal seals mostly made of lead, but for important documents gold bullae were adopted. An important step in understanding sealing as an identification instrument was made in the year 1166 when the bulla *De fide instrumentorum* of Pope Alexander III, confirmed the idea of *sigillum authenticum*.[2]

Lead and wax seals appeared also in the early Piast state in the 11th–12th centuries. Already, five Polish lead bullae dated to the first half of the 12th century have come to light during the last 20 years and have been published (Jurek 2006; Sawicki 2007; Dębska *et al.*, 2008; Andrałojć and Andrałojć 2009; Hlebionek 2009; Suchodolski 2009). The allegedly oldest documents of a ruler of the Piast state, mentioning a seal (dated 1051–1054) comes at least from the 1130s,[3] even the forged seal was based on an original (Pac 2015: 6–7). But still the document for the cathedral in Bamberg, issued c. 1100 by the Piast duke Władysław Herman is considered to be the oldest Polish sealed document. In turn, the earliest preserved church document on which the seal has been preserved is the foundation document of the Cistercian monastery in Łekno from the year 1153 (Dobosz 2003: 74). Two documents of Sierosław II – the bishop of Wrocław originate from the end of the 12th century, the impression on them are considered to be the oldest seal of a Silesian clergyman (Krahmer 1935: 5).

SEALING BY THE CHURCH

In the second quarter of the 13th century, the practice of sealing documents became common. Not only papal, bishop, royal and princely letters were sealed but also documents issued by knights, townspeople and lower clergy (Krahmer 1935: 5–6; New 2019). The synod held in 1248 in Wrocław introduces the obligation for *offici* of the church to use a seal (Krahmer 1935: 8). In the mid-thirteenth century in Lower Silesia, most monastic organizations and the abbots, as well as the church clergy, had their own seals (Krahmer 1935: 5). The chronology of such changes in other centres of religious life in the

[2] A *sigillum authenthicum* "should be well known and famous" – in the words of Conrad de Mure (Bedos-Rezak 2008: 4).

[3] Rycheza, the daughter of the north German duke Enzo and Mathilda, sister of Kaiser Otto III, married Mieszko II (1025–1032) the second king of Piast state, and stayed till his death (1034) in Poland (as a queen till 1032). She issued the two documents mentioned after returning to Germany and entering the monastic house in Brumweiler; so they are not connected with the Piast state but were signed by former queen of it.

Piast state did not differ much. In 1257, during the synod in Łęczyca, the parish priests were ordered to mark all correspondence with a seal containing the name of the church (Gromnicki 1885: 87). In the first place, parish offices signed documents regulating matters important for religious communities with a seal (Bünz and Kubin 2004: 44). There was also a second circulation of letters in the form of confirmations of bishop's ordinances, correspondence between parish priests, property confirmations, or benefits in disputed property matters, e.g., inheritance and division of property. Probably in such cases the personal seal of the priest managing the parish was used (Bünz 2007: 40–41).

The oldest medieval seal matrix type was a ring, a form already known in antiquity. A connection between the seals of antiquity and the Middle Ages might be the seal ring of the Merovingian king Childeric (458–481) found in his grave (Engler 1989: 243). Later, seal matrices were in the form of an incised metal slab, made of copper, copper alloy, and seldom of lead; sometimes, but rarely, silver and gold seal-matrices were used. This metal plate frequently had the shape of sharp-ended oval often called a mandorla, and these were used by representatives of the church, especially in the 12th to the first half of the 14th century (Schulz 1871; Krahmer 1935; Gumowski 1960).

THE FIND FROM GIEBŁO

A unique and well-preserved medieval seal matrix was discovered in the village of Giebło,[4] Ogrodzieniec municipality, Zawiercie district in the Cracow-Częstochowa Upland, a territory belonging to Lesser Poland (and administratively to the present-day Silesian Voivodeship; Fig. 1). It was found by the wall surrounding the churchyard of the Romanesque church of St. James the Apostle, 14.2 m from the southern wall of the church. The artefact was located at a depth of 10–15 cm under a layer of fine rubble mixed with humus. The place was originally occupied by the church cemetery, and both church and the former churchyard were surrounded by a stone wall from 1787, pulled down 10 years ago and replaced with a new limestone wall.[5] The church itself is considered to be one of the oldest surviving rural knight's churches in the historical region of Lesser Poland. Originally it had the form of an aisleless Romanesque square structure with a triforium in the western part, where the bell-tower was located (Fig. 2). On the basis of architectural features, the Romanesque church in Giebło was determined to date to the second quarter of the 13th century (Świechowski 2000: 56) although it is possible that it already existed in the middle of the 12th century (Kutrzebianka 1953:

[4] Mentioned in medieval sources as Kebel (1325), Kepl (1335), Kbel (1336) and in 15th century Gyeblo (Leszczyńska-Skrętowa 1986: 724–726).

[5] The finder was Mr Leszek Dziaduch who handed over the seal matrix to the Silesian Provincial Office of Monument Preservation in Katowice through the author of this text.

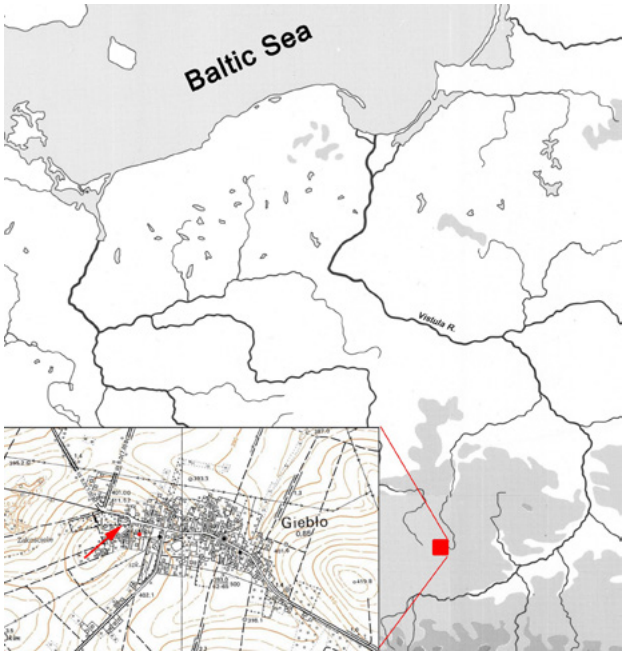

Fig. 1. Giebło, Zawiercie district. Location of the village and location of the discovery (arrow) and knightly seat (square). Source: Geoportal.gov.pl

Fig. 2. Old church in Giebło, Zawiercie district, Silesian Voivodeship bevor demolishing of the tower. Photo by O. Sosnowski.

36–37; Zachwatowicz *et al.*, 1971: 686; Pierzak 2014: 206). The structure was rebuilt and enlarged in the years 1911–1912, which unfortunately resulted in the demolition of the Romanesque western tower and its replacement with a new one. It is possible that during this great reconstruction, the seal matrix was moved with earth to the church yard wall. It cannot be ruled out that the artefact originated from the damaged tomb of a priest.

The seal matrix from Giebło is made of a lead alloy.[6] It has the form of an almond-shaped plate (mandorla) with a longer axis of 4.2 cm and a transverse axis of 2.4 cm, the weight is 24.9 g. The plate, 3–4 mm thick, is equipped on the back with a 9 mm raised rib running longitudally, provided with an ellipsoidal shaped pierced lug through which a cord, thong or chain was threaded.[7] The base of this rib is a slightly marked in relief with a *fleur-de-lis*. The face of the die is engraved with a *fleur-de-lis* crowned with a cross.[8] The inscription in Gothic capital letters on the face begins with an initial + and reads: *S*(igillum)*LUCIIANIPRESBITERI.* This indicates that the user of the matrix was a priest named Lucianus. The schematic engraved lily flower is separated from the legend by an engraved line (border), reflecting the arched shape of the edge (Fig. 3).

Fig 3. Giebło, Zawiercie district. Lead seal matrix – 14th century; a – the seal face; b – back; c – three quarters side view. Photo by L. Krudysz and J. Popielarz.

6 No metal analysis was made but this was the opinion of the conservation workshop of the museum where the seal matrix is exhibited. Jacek Pierzak who describes this find in *Hertitage Conservation News* also concurs (Pierzak 2014: 210).

7 Currently, the artefact is in the collection of the Castle Museum in Będzin – inv. No. MB/A/1/2015.

8 Reading of the legend, starts from the top usually (Kittel 1970: 199–202); in this case, the lily flower would be perched on the cross; to have the inscription starting with the initial cross from the top, the *fleur-de-lis* should be upside down down (see Fig. 6).

THE LEGEND

Except for the smaller PRE letters, the letters of the inscription are more or less of the same height, but they differ significantly in width (Fig. 4). Romanesque and Gothic letters are mixed, which is typical for 14th century inscriptions (Trelińska 1991: 28). Apart from the closed letter "E", all other letters of the inscription are derived from Roman square capitals. Nevertheless, the typeface of some letters indicates that we are dealing with a Gothic script. The letter "I", bold in half, indicates an inscription made at the earliest at the beginning of the 14th century (Trelińska 1991: 33). Another feature of the Gothic letters are the wedge-shaped stems of "A, N, I, L, T". The drawn upper bar of the letter "A" and the thinned parts of the convexity of the bellies on letters "P, B and R" are also characteristic (Semkowicz 2011: 480–482). The character of the letter "E" is similar to an uncial script and is closed with a perpendicular line joining its ends. These features of the script allow us to classify the inscription on the seal matrix from Giebło to the early phase of the Gothic letter case, the duration of which was determined from the turn of the 13th/14th centuries to c. 1380 (Trelińska 1991: 33). Careful examination of the legend allows us to observe that the engraver working on the circumference of an object of a particular shape, made the letter "R" – located in the highest point – a little less skillfully, which stands out from the rest of the inscription. However, it is puzzling to see the use of the double letter "I" in the name of Lucianus. Is it a mistake of the engraver, or was this procedure aimed at marking some peculiarity of the name (lack of "J" underlined by a double "I"?). Most likely it was about the symmetrical arrangement of words along the edge of an oval object. Probably for this reason the engraver tried to lengthen the word by one letter to ensure balance in the inscription on the seal; it seems that keeping the letters of the same size and without introducing a "filler" in the form of an additional sign, a space between the cross separating the inscription and the last "I" of the word PRESBITERI ending the inscription would be difficult to complete. However, although the engraver who made the seal took care in equal spacing between letters and words, it was at the expense of the width of the letters. This is clearly visible in the word defining the church function – PRESBITERI, where, after engraving PRESBI the letters TERI are stretched and widened so that the closed "E" and extended "R" are as wide as the beginning of the section of the word with five letters – RESBI. The

Fig. 4. Giebło, Zawiercie district. Inscription on the face of the matrix. Drawn by L. Krudysz.

letter "R" itself, placed in the highest point, the least regular of the entire writing, is twice as narrow as the second R in this word. The engraver clearly assumed that the lowest, last letter of the inscription –"I", should be located at the same distance from the mark that begins and separates the legend of the matrix as the letter "S" stands for *SIGILLUM*. As a result, the distance of both letters from the cross corresponds to the spacing between the particular letters. Moreover, the placing of "P" without separating it from *LUCIIANI*, as if it were one word *LUCIIANIPRESBITERI*, also indicates that for the seal manufacturer the most important thing was the distribution of the letters along the entire edge, with no empty spaces that would disturb the rhythm of the inscription. The letters themselves fell victim to this compositional procedure, a kind of epigraphic *horror vacui*. At the beginning they are neat and regular, which indicates that the engraving was carried out in accordance with the content of the inscription and first was + *S.LUCIIANI*, and then *PRESBITERI*, later the letters lose their proportions. The question arises about the professionalism of the workshop and the proficiency of the craftsman. The engraver attempted to circumvent the spacing difficulties by doubling the letter "I", which took up the least space. The artisan's difficulty was caused by the large number of these letters. In both words "I" occur twice, so it is not surprising that one more letter was added to fill the space. Of course, with the precise drawing of the intended inscription, it was possible to evenly distribute the letters by using, for example, one more separating mark on the axis of the matrix (where the first letter "R" is). Despite all the imperfections, the craftsman coped with the difficult task and the inscription, as well as the sign, remain in complete harmony in the seal impression.

Increasing the length of a word by adding the same letter, and some flexibility in doubling the letters, was a common practice in the Middle Ages. This can be observed even on coin dies, probably slightly later than the discussed seal matrix. On one of the preserved coins of Kazimierz III the Great from the collection of the National Museum in Cracow, a circumferential inscription: + *GROSI CRACOVIENSESS* (Kałkowski 1974: 97, Fig. 70b) was engraved on the reverse, where the craftsman "lost" an S in the word defining the face value. The correct spelling *GROSSI* occur on the numerous Prague groschen and on a various coins of Kazimierz III the Great (Szwagrzyk 1973: 58, No. 150). The artisan added an "S" at the end of the name of Cracow, although the correct entry in the *genetivus* is CRACOVIENSES.

Even more interesting is the engraving of the 14th century seal matrix of the leather belts manufacturers containing not only the second "I" in the name of the capital of the kingdom, but also city name in a different grammatical case, which in turn lengthened the inscription by two places and the word – CRACOVIIENSIUM (Wyrozumski 1992: 333) was created.

Such examples of medieval epigraphy, revealing the commonality of duplicating or juxtaposing letters so that the inscription has the number of characters needed by the

engraver can be found relatively often in the 14th and 15th centuries. This procedure was also used by the workshop from which the Giebło seal matrix originates, especially since the "I" that occur four times did not facilitate the even distribution of the short inscription. Moreover, the letters, not yet understood by everyone, complemented the mark placed on the matrix and play the role of an ornament.

The owner of the seal matrix was *PRESBITER* Lucianus. In medieval church hierarchy till the end of 12th century, this was the title given to the parson (Wiśniowski 1969: 57), lat. *plebanus*. Later a person ordained to the presbyterate met the requirements for receiving the parish priesthood.[9]

In fact, a priest of this name was mentioned when calculating the amount that the parish of Giebło (then called Kebel) was obliged to pay to the Pope in Rome in the years 1325–1327. Thanks to the Peter's Pence census, we learn that the Kebel parish managed by Lucianus was estimated at 1.1/2 grzywna [half-pound], of which the levy was 1 skojec 19 denarii: "*Item Lucianus, plebanus de Kebel, de marc. cum dim. pro medietate decime presentis anni solvit I scot. et XIX den*" (Ptaśnik ed. 1913: 211). It is the first mention of this parish – according to historians – existing before 1250 (Laberschek 1986: 246) and the first historically mentioned parish priest of Kebel. We do not know more about this person.[10] Perhaps the matrix recently discovered permits a closer look at this individual.

The Giebło artefact indicates, that apart from various types of copper alloys used to produce seal matrices up to the 19th century, lead was also used as a raw material. It is not surprising that this metal was used in the area where mining centres were active since the 13th century, mainly around Bytom and Sławków, and in the 14th century in Olkusz and Trzebinia (Molenda 2001: 14). The lead that was commonly used in the Middle Ages to make roofing sheets, window cames, weights, goods seals and so on, was also used near the places of mining to make objects of greater value, including those with inscriptions. The use of lead in the case of medieval ducal and papal bulls and the recovery of five early Piast bullae provides support to this idea. In contrast to medieval continental Europe, in England this metal seems to have been commonly in use to produce seal matrices in the 13th century. According to New (2019), lead and lead alloy were "most commonly used for personal seal-matrices owned by members of the lower classes". The British collections confirm a great amount of lead matrices. The online catalogue of the British Museum collection of medieval seal matrices

[9] The presbyter's place in the church hierarchy has not changed since the Middle Ages. The presbyter proclaims the Word of God, administers the sacraments and guides the faithful community entrusted to him by a bishop (Gigilewicz ed. 2012: 387–388). A clergyman of this rank was ordained higher than a deacon and lower than a bishop, and was subordinate to the bishop, differing only in the degree, and not in the essence of the priesthood (Pastuszko 2008: 39).

[10] Archival resources in Sosnowiec, Silesian Voivodeship – 50 km south-west from Giebło may perhaps have contained some documents signed by Lucianus, but they were burned down during World War II.

presents 68 items, made of lead, most of them dating back to the 13th century,[11] and almost all of them belonged to the non heraldic personal matrices (New 2019), depicting easy pattern like a star, or schematic plants. Sometimes a *fleur-de-lis* occurred on seal faces, such as BM 1988, 1006.16; see also examples in the Portable Antiquities Scheme.[12] Lead is soft, easy to melt, to hammer and engrave a sign which is not too complicated, needs not as special hardened tools as copper and copper alloy items. So the product should be not as expensive as in case of copper and copper alloy. For the priest from Kebel, the production costs could play an important role too, especially since in the times of Lucianus, the profession of seal engraver was not common, these craftsmen were sworn in, but did not create guilds, so the purchase of a well-made seal matrix could involve a considerable expense (Janowski 2013: 457). It is possible that it was a by-product of specialized engravers commissioning production to their students. More likely we do not have enough artefacts from that age, obviously this special product was not as common as in England. In the collection of the Cracow City Archives there is a lead seal die that in earlier literature was attributed to the alleged son of Duke Władysław II the Exile (Jelonek-Litewka 2009: 88) who reigned 1138–1146 but this claim is not credible.[13] In two other specimens – originating from Tyniec (Włodarek 1994) and Poznań (Dębski and Marciniak 2005) dated to the 13th century, only an admixture of lead added to copper was found.

FLEUR-DE-LIS

The repetition of the lily motif both on the face and back of the Giebło seal matrix seems to suggest the importance this motif for Lucianus (Figs 5 and 6). The lily flower motif, initially symbolizing Christ and later most often related with his mother Mary, was quite common in the iconography of Gothic sacral art (Foerstner 1990: 18). It is well known from matrices in British collections, as well as from nearer regions. In Prague, in layers dating back to the 13th/14th century, a circular seal matrix with a stylized lily on the face was found. There are a crescent and a star located on the sides of the lily. The name of the owner is visible in the legend: *MIKULAS SINEBERG*. According to the discoverer, the symbolism would indicate a member of the knightly class (Vysohlid 2014: 214).

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[11] Among them: BM 1987, 0403.19; 25; 28; 32; 34. BM 1988, 1006.7; 9; 16. Electronic document: https://www.britishmuseum.org/collection, accessed August 16, 2021.

[12] The author saw in British museums in Guilford (Surrey) and Bedford (Bedfordshire) lead matrices from the 14th century belonging to members of the knightly class. See also electronic document: https://finds.org.uk/database/search/results/q/seals, Rec.ID LIN-515DBD; SF-3Fc3B3.

[13] According to the information received from prof. Zenon Piech from the Jagiellonian University, this matrix is not credible and cannot be considered as an artefact from the period to which it is attributed.

Fig. 5. Giebło, Zawiercie district. The face of the seal matrix – drawing. Drawn by L. Krudysz.

Fig. 6. Giebło, Zawiercie district, present-day seal impression, the probable way it originally occurred on a document, with the initial cross at the top. Photo by L. Krudysz.

The lily as a symbol of the ruler's dignity is also a principal motif in the heraldry of medieval France, popularized in Poland by knights and the court of Louis I of Hungary (1372–1384). Thus, the lily motif adorns many of Polish coat of arms, for example Gozdawa or Komar. In fact, knightly coats of arms, derived from simple family signs – usually a combination of an arrow, a semicircle and a cross – were created in the fourteenth century (Piekosiński 1896). In the course of their evolution, coats of arms occur that have the so-called the "nailed" cross, i.e., stuck or stamped. One of them is the Nieczuja (in the blue field, an *ostrzew* with nailed silver cross). This *ostrzew* or *ostrew* is an oak trunk with knots sticking out on the sides. Thus, we are dealing with a representation of a plant with a cross in the upper part of the picture, as in the case of the Giebło artefact. There are many such representations, crowned with a cross, that appear in the seals throughout the 13th and 14th centuries, starting with the seal of Mark, voivode of Cracow from 1220 (Piekosiński and Diehl 1899: 57, No. 48, Fig. 41, 68, No. 72, Fig. 57, 81, No. 94, Fig. 72; 95, No. 126–127, Fig. 97–98, 107, No. 157, Fig. 113, 158, No. 179, Fig. 179). The Komar coat of arms, presenting an inverted lily topped with a cross (a white lily, turned downwards, with the cross standing straight on it), is the closest parallel to the motif of a lily with a cross on the discussed seal (Niesiecki 1839–1845: 164–165).[14] Therefore, one of the motives for

[14] In all cases, as in the Giebło artefact, the arms of the cross narrow towards the main stem. In the

placing the lily with the cross could have been the suggestion of belonging to the prestigious, economically superior social groups. Was Lucianus a skilful maneuverer that suggested he belonged to a privileged group by using the symbolism of "a white lily with a cross standing straight on it" – as one could paraphrase the heraldic description of the previously presented coat of arms? This is only a hypothesis, we have no premises to prove the above considerations.

Authors publishing considerations on the origin of the medieval strata of Polish society indicate that the sphere of the medieval clergy was generally derived from the nobility (Piekosiński 1896: 37; Wroniszewski 2006: 238). Assuming, that in most cases medieval parish documents were authenticated with the personal coat of arms seals of the parish priests, in the case of Lucianus we can presume some kind of ancestral mark (Adamczewski 2010: 120). Even if the parish priest from Kebel did not belong to a distinguished stratum of medieval society, he would have changed his status of a lower born person by receiving ordination to the presbyterate. And the benefices connected with this position gave him the conditions of a well-endowed person.

It is worth emphasizing, however, the church in Giebło, in which Lucianus performed his pastoral service, is considered to be a defensive church (Wojciechowski 1912: 8; Świechowski 1990: 41). In the empora (*triforium*) in the western wall originally sat the *collator* (the owner of the estates in a parish).[15] It cannot unambiguously be stated who the owner of Giebło in the first half of the 14th century was. There are sources suggesting that in that time the village belonged to the property of a magnate house, using the Pobóg coat of arms[16] ("In a red field, a silver horseshoe with a golden knight cross nailed on the shoulder"; see Paprocki 1858). A knightly seat has been located nearby. Only 40 m from the church in Giebło, on the S-E slope of the hill relics of a residential and defence tower, built on a square plan with a foundation thickness of 2.05 m and a side reaching 14.70 m have been discovered (Kosmala 2000; Pierzak 2014: Fig. 2; 2000). The lack of clearly chronologically defined materials and the poorly preserved cultural layer make it possible to date the excavated building only generally to the first half of 14th century.[17] So it is very likely that this knight's seat already existed when Lucianus held his priestly service in Giebło. The contact between the parish priest and nobleman seems to be obvious. A medieval magnate as the church

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medieval heraldic description of the Nieczuja coat of arms there is a mention of "a studded Knightly cross".

15 The *triforium* was located in the wall of the tower forming the western wall of the church, dismantled in 1911.

16 The first owner of the village, confirmed in sources, is Piotr of Giebło, noted in 1394, grandson of Przedborz of Koniecpole, of the Pobóg coat of arms (cf., Sikora 1983: 24).

17 According to Jacek Pierzak, the thickness of the walls and few pieces of pottery in the research excavations, suggesting a multi-storey structure from that time; later he suggested dating of the relics to the 13/14th century.

patron took care of the priest's salary, giving him a benefice, which included church land, tithes, and pastoral donation (Wiśniowski 1969: 71). His contact with the parson was inevitable, because he and his family sat in the empora during the mass.

Medieval seal matrices of the lower clergy are extremely rare discoveries, although already at the turn of the 13th/14th centuries, the sealing of documents by priests was quite common (Kozłowska-Budkowa 1950: 490–491). In German territory for instance, thousands of matrices had been used, but only a few were still preserved. Such items were destroyed to avoid them being misused to authenticate a forgery, sometimes they were put in the grave of the owner (Ewald 1914: 109; Bresslau 1931: 554–558).

Until now, the only discovery of a seal of a clergyman holding the office of a parish priest, which chronologically corresponds to the discussed Giebło artefact, is the ring of Przecław, which was found in 1958 on the site of the former Canons Regular abbey in Czerwińsk, Płońsk district, Masovian Voivodeship. The ring has a circular bezel engraved with a decorative letter "T" and the legend: *S.PRCCSLAI.CUR.CON*. Przecław, as *Curator* or *Curatus*, was a parish priest in a town whose full Latin wording could have been *Conecensis* (Chojnice) or *Coninensis* (Konin). According to the eminent medievalist, author of the note about this discovery, the typeface of the letters indicates at the turn of the 13th and 14th centuries (Kozłowska-Budkowa 1950: 490). It is also worth mentioning the medieval seal matrix of the Dominican lector Jacob (Dębski and Marciniak 2005: 161–167) as well as the still unpublished discovery of a medieval seal matrix from Cracow.[18] Finds of this type are also rare in the neighbouring countries. There are references to two specimens from western Czechia in the literature. The first is a seal matrix that was discovered in 1985, during the archaeological research of the Pusperk stronghold in western Bohemia (Durdík 1985: 175–177), and a second, engraved with a legend: + *S.PETRI PLEBANI DE GLAThOVIA* from the early 14th century, used to seal documents in Klatovy parish, western Czechia, currently in the collection of the Kestner Museum in Hanover (Battenberg 1985: 199, No 72). The collection of the Town Archives of Arnsberg in Northrhein-Westwalen contains a bronze seal matrix dated 1300. It belonged to a member of the local aristocracy, Friedrich von Hüsten, the parish priest in Hüsten – the oldest part of Arnsberg in Nordrhein-Westfalen, district Hochsauerland (Gosmann 1992: 37–39). It is worth mentioning also the seal matrices of this type of the parish of St Peter in Döhren in Niedersachsen[19] and a bronze example of this type found in Banská Štiavnica of the *presbiter* Henry dated to the 13/14th centuries: *S*(igillum)*HENRICI P/RES/B/ITE/RI D/E/SELLINA*

[18] Information entitled: medieval seal matrix of the Dominican brother John – the archaeological context of the discovery and an attempt of historical interpretation, presented by dr hab. Tomasz Gałuszka OP and dr Dariusz Niemiec at the 230th meeting of the Polish Heraldic Society, Cracow Branch on June 10, 2019.

[19] It is not a *sigillum* with the name of the priest, but of the parish: *S*(igillum) *EEC*(LESI)*E SANCTI PETRI IN DORNDE* with the impression of St. Peter on the face (Bünz 2007: 33).

(Labuda and Glejtek 2020). The above-mentioned artefacts of medieval epigraphy were made of copper alloys; there are no reports on a 13th or 14th century seal matrix made of lead in this part of Europe. This emphasizes the uniqueness of the discovery from Giebło. In the absence of such finds in Poland and abroad, it must be assumed that the use of lead in the production of this type of objects was not common in our lands. The fact that lead required a less proficient engraver is demonstrated by examples from British collections with simple, uncomplicated symbols, belonging to less affluent people, some of those items are listed above.

Kebel was located near the border with Silesia. The name Lucianus does not appear in the list of old Polish names, rather it is a name that has a tradition in Western Europe. It is possible that Lucianus came from Silesia and took over the parish in Kebel. He adopted a distinctive sign resembling a noble coats of arms as his attribute on the seal. No doubt we are dealing with a personal seal matrix. Medieval seals of parsons usually contain the name of the parish preceded by *de* (Bünz and Kubin 2004: 37–38; Sobel 2020).

As mentioned above, the lily is a symbol that expresses devotion to the Blessed Virgin Mary. Finally, it should be mentioned, that it was a frequent motif on the seals of Cistercian abbots, because this order had special devotion to the Virgin Mary, who was the patron of this congregation (Mussbacher 1986: 151–177). It occurs for example on the seal of Martin, the presbyter from Osina, which is preserved on a document of May 6, 1312, issued in Otmuchów (now Opole Voivodeship, Nysa district), next to four other seals of the parsons (Sobel 2020: 45, 57–59, 64). A high similarity to the discussed artefact from Giebło may be seen here. The iconography of both of them involves a heraldic lily (*fleur-de-lis*), and there is another similarity in the content of the legend. The Otmuchów seal refers to the priest Martin himself: +S.MARTINI PRESBIT but not to his parish just like on the seal from Giebło, therefore both legends are identically individualistic/personal. They are also similar in belonging to individuals of the same function which, as we know for the times of Lucianus and Martin, meant only a ministering priest, not a parish administrator, i.e., a parson/parish priest (Wiśniowski 1969: 71). This is also how the author of the studies on the Otmuchów diploma presents it; accepting the thesis that placing the title *presbyter* and not a *plebanus*, as on the other seals of the discussed document, resulted from Martin's subordination to the Cistercian abbot in Kamieniec Śląski (Sobel 2020: 59). Did Lucianus have anything to do with the Cistercians? This is hard to determine. Jacek Pierzak, the author of the first extensive note on this find, draws attention to the fact that parsons often served various parishes. Therefore, he assumes the hypothesis that in order to avoid costs, sometimes a universal seal was made, not assigned to one parish, and that would have happened if the name was written on the seal matrix (Pierzak 2014: 205); in this case it would be *de Kebel*. The author of this text believes that the use of the word *PRESBITERI* might be more due to the restrictions imposed on Lucianus, as was in

the case of Martin, the presbyter from Osina Wielka. In both cases, the name of the parish is missing in the legend and, strangely, in both cases, a *fleur-de-lis* is depicted. Only the cross, which prompted reflection on the cause and symbolism of the depiction placed on the seal from Giebło, differentiates both images. Placing a cross on the seal face (apart from an initial cross in the legend) was an easy way to show that the seal's owner was a representative of the Church. Perhaps in this way, Lucianus also "secured" his seal by supplying it twice: with the basic sign of Christians and with Mary's sign, which was particularly important to him. In this way, by putting signs of Mary and her Son, which doesn't exclude a deliberate reference to heraldic signs, the presbyter Lucianus splendidly engaged with the idea of a *sigillum authenticum*.

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John Morton Coles (1930–2020). From Palaeolithic Studies to Wetland Archaeology. A Commemoration

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This article is dedicated to John Morton Coles (1930-2020), Professor of European Prehistory at Cambridge University between 1980 and 1986, Fellow of the British Academy, author of the highly regarded scientific works, teacher and editor. He dealt with several archaeological periods and was involved in different field projects and conducted numerous excavations.

At Cambridge, in the Department of Archaeology, John Coles collaborated with such significant figures as Professors Grahame Clark and Glyn Daniel. John Coles devoted much of his time to experimental and wetland archaeology as well as to prehistoric rock carvings in Sweden and Norway. John Coles was awarded an honorary doctorate by Uppsala University. He was the advisor of Biskupin's archaeological open-air Museum in Poland.

KEY-WORDS: John Morton Coles (1930-2020), British archaeology, European Prehistory, Cambridge University, Somerset Levels Project, Scandinavian rock carvings, open-air museum at Biskupin

Many archaeologists limit their scope of research to one archaeological period or subject. Others limit themselves to conducting excavations and publishing the results. This was not the case with John Coles. Much like V. Gordon Childe, he dealt with several periods, while his activity in the field of archaeology was even more diverse. It played out across the Palaeolithic, Mesolithic, Neolithic, Bronze and Iron Ages, traditionally understood as nearly the whole of prehistory, as well as in the experimental, wetland and environmental sub-fields of archaeology. He was both teacher and researcher, and gave university lectures and conducted numerous excavations. He was President of the

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Prehistoric Society and a member of the editing boards of archaeological periodicals, including *Proceedings of the Prehistoric Society* and *Antiquity,* an outstanding organizer and a populariser of science. In 1978, he was elected Fellow of the British Academy.

John Coles was born on 25 March 1930. Like Childe, he arrived in Britain from one of its dominions, in John's case from Canada. His grandfather had emigrated from England to Canada and settled in Woodstock, Ontario, a small town not far from the border between Canada and the United States. His father had grown up there, and both his parents were involved with the activities of the town, while summer holidays were spent on the shores of Lake Huron. After leaving school in Woodstock, John went to Victoria College, University of Toronto, and graduated in Classics in 1952. During his studies he also played tennis, and he was awarded his tennis colours in the same year. Following his graduation, he worked from 1952 to 1955 at his father's office in Woodstock. His father's real-estate, insurance and investment business was not what John dreamt of: in the introduction to his memoir, *Yesterday's Man,* he described the work as "doing things that were of little interest of me, buying and selling" (Coles 2019: 1).

The summer of 1955, young Coles spent travelling around Europe as a tourist. This was his first encounter with the rich prehistory of the western part of the continent. In August 1955, he reached England. With the support of his parents, he decided to take up studies in ancient history and archaeology. Friends in Lincolnshire introduced him to Cambridge University and his adventures with archaeology began, owing in part to the kindnesses of persons such as Dr Leslie Wayper and Mary Thatcher. Probably it was because of them that Professor Grahame Clark (1907–1995) honoured John with an invitation to tea, and there and then accepted him as a new student, something John was to recall with appreciation in his memoir (Coles 2019: 2). Professor Clark (Fig. 1) later wrote, in *Prehistory at Cambridge and Beyond*, that "Coles himself had come to Cambridge as an affiliated student from Toronto" (Clark 1989: 63).

Fig. 1. Grahame Clark (1907–1995). Photograph after *Proceedings of the Prehistoric Society*, vol. XXXVII, part II ('Contributions to Prehistory Offered to Grahame Clark') 1971.

John's time as a Cambridge student, from 1955 to 1957, is vividly depicted in his last publication, the memoir *Yesterday's Man. An archaeological life 1955–1980*

(Coles 2019). It includes many insightful characterisations of significant figures he met during his time at university and throughout his scientific career. To readers from mainland Europe, it is an interesting source of information about archaeological education at Cambridge in the 1950s and 60s.[1]

John recalled many amusing situations from within the walls of the University as well as from extensive field work. Here is one example:

> "The projection of slides, hand-operated by a member of the faculty Assistant staff, was something amusing with upside-down pictures and we students would count the number of times a confusing slide could be projected before it appeared correctly; we never I think got to the number seven, but the junior lecturers could get flustered easily and we doubtless had little sympathy with them unless some catastrophic event occurred such as the projector bursting into flames, a glass slide shattering *in situ*, or the screen collapsing; all of these happened during my time there" (Coles 2019: 6).

Although his final book is a mere 114 pages long, it is a memoir of a researcher with a sense of professional fulfilment, in which he describes himself, his contemporaries and events with subtle and humorous detachment.

A salient feature of course structure at Cambridge at that time was a division into two Parts. Part I was a year-long introduction to Archaeology, Physical Anthropology and Social Anthropology. Part II was a two-year course in just one of the above disciplines and with some specialization within the single subject, leading to a Diploma. For this John chose Palaeolithic Archaeology, and Geological and Botanical courses. Additionally, for students of Part II, the curriculum included two general thematic series, one on the Aims, History and Scope of the subject, and one on Methods and Techniques. At this time, the Department of Archaeology employed as lecturers and directors of courses such significant figures as Professor Grahame Clark (Head of the Department), Dr Glyn Daniel (1914–1986) and Dr Charles McBurney (1914–1979). When John Coles arrived, earlier alumni of the Department such as Louis Leakey (1903–1972), Thurstan Shaw (1914–2013) and Desmond Clark (1916–2002), were making the prehistory from Cambridge famous far beyond the borders of Great Britain (Clark 1989: 29 and 52; Smith 2009: 117–122 and 182–189).

Dr Miles Burkitt (1890–1971) and Dr Charles McBurney played an important part in John's Palaeolithic studies. His relationship with these scholars, both professional and personal, as well as his connection to Grahame Clark, had a formative influence on John Coles as a researcher, academic teacher and archaeologist leading numerous multidisciplinary projects. On top of all that, he played tennis, which also shapes the character (Coles 1997; 2019: 18, 28; Coles J. *et al.*, 1999).

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[1] Preceding decades are depicted in a well researched book by Pamela Jane Smith (2009).

In the memoir written for the British Academy following the death of his first teacher at Cambridge, and published in its *Proceedings,* John admitted:

> "As a University Lecturer, Clark was not always appreciated by his students. His lectures were generally considered to be rather poorly constructed, and often wandered from the subject in hand" (Coles 1997: 370).

But it was Clark who, through his exemplary research at Star Carr (North Yorkshire) introduced John to the field of Mesolithic archaeology and wetland archaeology. Following Clark's publication of the site in 1954, it soon became a milestone for the development of wetland archaeology internationally (Clark 1954; 1972, see also Renfrew and Bahn 1991: 33; Fagan 2001: 145–168; Trigger 2007: 358–360). Clark's previous book *Prehistoric Europe: the Economic Basis* (1952) inspired a new generation of young researchers such as Coles himself to broaden their scientific horizons. It was translated into Polish and carefully released in Warsaw five years after the English edition. The translator was Józef Kostrzewski (1885–1969), an eminent Professor of the University of Poznań. According to Jacek Lech, Kostrzewski's intention was to demonstrate how it was possible "to research the economic basis outside Marxist methodology", because:

> "…Clark was doing it much better than Marxist prehistorians were, or historians of material culture, as they were known, had done earlier. Kostrzewski had just been forced into early retirement by the communist authorities and he must have felt great satisfaction translating Clark's work into Polish" (Clark 1957; Lech 2010: 171–172; cf., Kostrzewski 1970: 283–284).

By the end of his first year at Cambridge, Coles had become interested in Palaeolithic cave paintings as well as stone tools. For this reason, in the summer of 1956, he decided to learn about cave art where it is represented the best – in France and Spain. His friend Charles McVean accompanied him on his travels. He was able to participate in Professor André Leroi-Gourhan's (1911–1986) excavations in Arcy-sur-Cure in France (June-July 1956). Those were John's first well-organised and exemplarily-conducted excavations and he learned a lot (Coles 2019: 22). They were followed by visits to famous caves with Palaeolithic paintings and carvings: Lascaux, Les Combarelles, Niaux, Cantabrian Altamira, Pindal, Castillo and others. The adventures he had along the way as well as the return journey through Brittany, where he studied the famous megalithic ceremonial complex during his stay in the Carnac region, were depicted with great sense of humour. Here is the shortened description of one adventure:

> "As we approached the Breton landscape, one early evening, we came up behind a small van, in the open back of which were two Frenchmen in their country clothes. They sat on boxes and were smoking. We followed them along and one of the men reached down and proffered a small fish to

> us. We nodded yes and he chucked it at our windscreen. Others soon followed and as fast as McVean could gather in, as I was attempting to drive through the fish-smeared glass, he passed them back to our female companion, and more and more of the fish splattered onto the car… We camped and had fine feast of fried fish, and we three were then ill all night" (Coles 2019: 26).

Dr McBurney was supportive of John's interest in researching the painted caves of the Palaeolithic, and he had his own interest in research on the Palaeolithic deposits in caves in Great Britain. They went on a tour of caves in England and Wales, which proved to be somewhat chaotic. As a consequence, John gave up the intention of pursuing a doctorate in the Palaeolithic to focus on a different period instead. Looking for a new topic and a supervisor, he visited Oxford, where he was to meet with Professor Christopher Hawkes (1905–1992), a leading exponent of the West European Iron Age. Hawkes was absent, but at the entrance to the Ashmolean Museum, John ran into Professor Stuart Piggott (1910–1996), Abercromby Professor of Prehistoric Archaeology in the University of Edinburgh (Fig. 2). This led to another meeting in Edinburgh and the decision to study for a PhD (doctorate) at the Department of Archaeology in Edinburgh University. Piggott suggested the Late Bronze Age of Scotland as the subject of John's research, which the candidate accepted with some hesitation as he was not familiar with the subject, although it seemed promising (Clark 1989: 63–64; Coles 2019: 29).

This first Scottish episode in John's scientific life lasted from 1957 to 1960, during which time he lived in Edinburgh and conducted extensive research on the collections of the National Museum of Scotland and other cultural establishments. He was elected to the Society of Antiquaries of Scotland, and he published his first articles on the Scottish Late Bronze Age in the society's *Proceedings* (Coles and Livens 1960; Coles 1961; 1962a). Then came an article on European Bronze Age shields published in *Proceedings of the Prehistoric Society* (Coles 1962b). Alongside his studies, he continued to play tennis, with considerable success.

Fig. 2. Stuart Piggott (1910–1996). Photo: M. J. Murray. After J. M. Coles and D. D. A. Simpson (eds), *Studies in Ancient Europe. Essays presented to Stuart Piggott*. Leicester, University Press 1968.

Working with Piggott led to a life-long friendship for the two of them. At the very beginning, the eminent scholar offered John the opportunity to visit together museum establishments in the north of Scotland, where they studied collections, often scattered, of artefacts of the Bronze Age. The archaeological journey in the company of Piggott was "probably the most beneficial and certainly the most entertainingly instructive" (Coles 2019: 32), and filled with unexpected adventures, for example:

> "We searched through various boxes that lay amidst the museum furniture…One socketed axe could not be found and I was insistent that it should be somewhere amidst the dismantled collection. I found it, inside the half-opened jaws of stuffed alligator that lay on the floor" (Coles 2019: 34).

In August of 1959, John submitted his PhD to the University, but was told it was too soon, he could not submit until he had completed at least two years of research. He re-submitted a couple of months later. His examiners were Terence G. E. Powell (1916–1975) and Stuart Piggott. Powell, like Coles, had an interest in prehistoric art (Powell 1966), and they became good friends. And, as we learned from Bryony Coles: "Also in 1959 John was awarded the Scottish Tennis Cup".

The relationships John formed in Scotland, especially with Stuart Piggott, stood the test of time. As a token of his respect and gratitude to his senior colleague, supervisor and friend, he co-edited (Coles and Simpson eds 1968) a book beautifully delivered by Leicester University Press. It contains the essay *Ancient man in Europe* (Coles 1968a), as part of research for a book devoted to the Palaeolithic (Fig. 3a) that he was working on at the time (Coles and Higgs 1969; 1975).

In later years, as John pursued his academic career, he often returned to Scotland as an invited guest, an advisor on excavations, a lecturer at Scottish conferences or delivering lectures to the general public. He was an outstanding promoter of archaeology, and from 1992 to 2002 he served as a member of the Royal Commission on the Ancient and Historical Monuments of Scotland.

Having returned to Cambridge in 1960, John devoted much of his time to teaching students at the Department of Archaeology. He had not suspected how time consuming it would be, although looking back he admitted that the time between 1960 and 1980 was also filled with intense activity outside the didactic work (Coles 2019: 45–57). At the same time, he had become engaged in the increasingly complex fields of wetland, environmental and experimental archaeologies (Coles 1963a; 1973; 1976). Bursting with energy, he always maintained a positive outlook on people and the world around him (Fig. 3b, c; cf., 3e). He was made a Fellow of Fitzwilliam College in Cambridge in 1963 and he retained his connection with the college for the rest of his life. At his passing, the following message appeared on the Fitzwilliam website: "As a public mark of respect, we flew the College Flag at half-mast on Monday 19 October".

Fig. 3. Covers of some of the publications mentioned in the article and related to John Coles' archaeological activity:
a – J. Coles and E. S. Higgs, *The Archaeology of Early Man*, Harmondsworth 1975: Penguin Books (2nd edition); b – J. Coles, cover of his first book on experimental archaeology, London 1973: Hutchinson and Co. Ltd; c – J. Coles, *Archaeology by Experiment* in the Polish edition, Warsaw 1977: Państwowe Wydawnictwo Naukowe; d – B. Coles and J. Coles, *Sweet Track to Glastonbury. The Somerset Levels in Prehistory*, London 1986: Thames & Hudson. Winner of Archaeological Book of the Year Award; e – A. F. Harding (ed.), *Experiment and Design. Archaeological Studies in Honour of John Coles*, Oxford 1999: Oxbow Books, on the cover – John Coles and Don Allan illustrating the techniques of Bronze Age combat. Photograph by Ralf Crane, 1963. ©Time/Life; f – cover of the first volume of *Journal of Wetland Archaeology*, edited by T. Brown, B. Coles, S. Rippon and R. Van de Noort, Oxford 2001: Oxbow Books.

Between 1960 and 1980, he progressed at Cambridge University from Assistant Lecturer to Lecturer to Reader in Archaeology, and between 1980 and 1986 he was Professor of European Prehistory. In 1978 he was elected to the British Academy, the foremost institution for the Humanities. He published a number of books aimed at students, notably *The Archaeology of Early Man* (Coles and Higgs 1969; 1975) which was read by generations of students (Fig. 3a), as was *Field Archaeology in Britain* (Coles 1972). Together with Anthony Harding, whose PhD he had supervised, he wrote and published a highly regarded work *The Bronze Age in Europe* (Coles and

Harding 1979). Through all these years he was teaching, alongside being active in the field of archaeology and publishing the results of his research, which dealt with a vast range of topics (Coles 1982; Coles B. *et al.*, 1999).

In *Yesterday's Man* John described the time (1967–1968) the Prince of Wales spent at Trinity College, naturally in his characteristically poignant and detached manner. The interested reader will undoubtedly find the original passage very rewarding (Coles 2019: 74–79).

Relatively early in his career, John became interested in experimental archaeology. The beginnings can be traced to a short article on the subject published in the weekly *Illustrated London News* (Coles 1963c). He devoted a great deal of attention to this field in subsequent years (Coles 1968b). Two of his books introduced a wide range of people to this subject that was often under-appreciated, but in John's eyes had great potential for yielding new insights for the understanding of archaeological evidence (Coles 1973; 1979). John tested the musical capabilities, so to speak, of prehistoric bronze horns from the collection in the National Museum of Ireland in Dublin (Coles 1963b), he conducted experiments with replica Bronze Age shields, made of bronze and leather (Fig. 3e), as well as ancient techniques of using flint, stone and bronze axes, during his time in Scotland and Cambridge, and over the course of his research in the Somerset Levels. The first of his books on the subject (Fig. 3b) was translated into Polish (Fig. 3c) by Dr Maria Miśkiewicz (Coles 1977). It should be noted that John devoted a great deal of attention to music (Coles 1973: 158–167; 1977: 224–238; 1978).

John cooperated with Peter J. Reynolds (1979), another important figure in the field of experimental archaeology, who developed the Butser Ancient Farm, in Hampshire. Together with his students, John regularly took part in experiments at Butser, at West Stow in Suffolk (woodworking and reconstructions of Anglo-Saxon houses), and at Middlesex Polytechnic – the art and craft of metal-working in copper and bronze (Coles 2019: 59–62). The underlying principles that he established concerning the field of experimental archaeology remain basically unchanged to this day (Coles 1997b). It is a noteworthy fact, especially as today the term experimental archaeology is quite often confused with archaeological re-enactment.

An important chapter in John's *curriculum vitae* relates to wetland archaeology. The field has developed in Europe since the study of the Swiss Bronze Age palafites in Obermeilen by Ferdinand Keller in 1854 (Coles 1997-1998: 288–289; Trigger 2007: 134), for example with Hans Reinerth's work around the Federsee basin, published in *Die Wasserburg Buchau* (Reinerth 1928; Coles 1997-1998: 289; Schöbel 2006) and Józef Kostrzewski with Zdzisław A. Rajewski on the wetland Lake Biskupin peninsula (Coles 1997-1998: 301–302; Piotrowska 1997-1998; Piotrowski 1998; Brzeziński and Piotrowska 2012: 30–36). Such investigations and publications were of great importance, and John's earlier 20th century predecessors made significant advancements in this area of archaeology.

In the later 20th century, Professor John Coles and his wife Professor Bryony Coles (*née* Orme) can be seen as pioneers of modern, comprehensive and interdisciplinary research on wetland sites (Coles and Orme 1980). From his time as a student at Cambridge, John was familiar with the results of Grahame Clark's excavations at Star Carr, and in the 1960s, encouraged by Clark, he began work in the Somerset Levels, excavating several brushwood trackways, and in 1966 he identified a substantial wooden track, known as The Abbot's Way (Coles 2019: 63).

In 1970 a new trackway was discovered by Ray Sweet, one of the peat diggers, and named the Sweet Track by John. It proved to be a very significant structure, and led to the initiation of the Somerset Levels Project in 1973, set up by John and Bryony together with palaeobotanist Alan Hibbert and Dr Geoff Wainwright from the Department of the Environment. The results from the long-term Project had a ground-breaking significance (B. and J. Coles 1986). It was carried out from Cambridge University, Department of Archaeology and University of Exeter, Department of History and Archaeology. Between 1975 and 1989 John was the editor of *Somerset Level Papers*, which reported annually on the research in the Levels. The already-cited book, *Sweet Track to Glastonbury* (Coles B. and Coles J. 1986) was a winner of the Archaeological Book of the Year Award (Fig. 3d). The work of John and Bryony Coles in wetlands in many different parts of the world (Coles J. M. and Coles B. J. 1989), their dedication and fruitful collaboration with their colleagues as well as exponents of other natural sciences, allowed the development of a multifaceted enterprise. Such an approach to archaeology was becoming more frequent, and today is almost universal. This was a continuation of the tradition referred to by P. J. Smith (2009: 39–68) as "Grahame Clark's New Archaeology" and developed by him at Cambridge in collaboration with "Men in White Coats".

Fig. 4. Special tool used during exploration activity on the Somerset Levels site. Professor J. Coles' gift to Wojciech Piotrowski. Photo by J. Lech.

John never gave up on trans-regional wetland problems (Coles and Lawson 1987; Coles B. J. and Coles J. 1989), and using the Somerset Levels Project as an example, he was the instigator of major wetland surveys (Figs 3d and 4), funded by English Heritage, in other regions of England, in the East Anglian Fens, the Humber Wetlands, and North West Wetlands (Coles and

Hall 1998; Coles 2002; 2019: 95–96). In 1984 his influential book *The Archaeology of Wetlands* (Coles 1984) was published, and his views also later appeared in *Archaeologia Polona* (Coles 1997-1998). He often emphasized the importance of matters pertaining to waterlogged wood preservation (Coles 1990b).

John expressed clearly his notion of wetland archaeology in *WARP Occasional Paper Number 1*:

> "The purpose of wetland archaeology must be to expand our knowledge of the past. For too long, dryland archaeology has dominates our thoughts. We should stop trying to fill gaps in our existing knowledge by continuing to practice traditional dryland, repetitive archaeology, and we should attempt to enlarge the whole basis of our information, to extend the frontiers, by innovative wetland expansive archaeology… Wetlands can provide a totality of evidence, unscavenged, of closely definable time-scales, which can obtain from no other source in northern latitudes apart from a few frozen sites" (Coles 1987: 242).

WARP, the Wetland Archaeology Research Project, was established by John and Bryony Coles in 1987, with its base at the University of Exeter. The newsletter of WARP, called *NewsWARP* and edited by John until late 2002, was published under the auspices of the project. Most of the conferences organized by WARP all over the world have been published in *WARP Occasional Papers*, with more wide-ranging issues alongside more general studies (for example Coles and Coles 1996). At the beginning of this century, the membership of WARP included more than 300 associates and about 50 institutions from around 30 countries (Coles 2001: vii–viii). John was in close cooperation with the first editors of *Journal of Wetland Archaeology* (first vol. in 2001) (Fig. 3f) – Tony Brown, Bryony Coles, Stephen Rippon and Robert Van de Noort (Coles 2001a: 3–13). Now, the *Journal* is edited by Dr Ben Gearey of University College Cork in the south of Ireland, while Dale Croes, Director of the Pacific Northwest Archaeological Society and Services, has developed an on-line presence for *NewsWARP*.

The creation of WARP enabled the development of international connections (Coles 1991), the organizing of joint conferences, mutual consultations, student exchange, and it fostered advancements in environmental studies and its popularisation (for example, Minnitt and Coles 1996), as well as supporting local museums. In the case of Somerset, John and Bryony's activity in the field of wetland archaeology have become something of a scientific and cultural hallmark of the region. In 1993 John Coles became an Honorary Professor at Exeter University. Among wetland archaeology researchers the world over, he will be remembered as a unique figure, which is reflected in his introductory articles for publications dealing with complex issues in the field (Coles 1988; 1998; 2001b).

Alongside his core activity in the field of wetland archaeology, between 1974 and 2005 John was researching Scandinavian rock carvings. His interest was supported by his friend Bo Gräslund from Uppsala University and later also by Lasse Bengtsson and Stephen Minnitt (Coles 2019: 109–110). John's research and his way of documenting the

images inscribed into rock outcrops in Sweden and Norway led to a different perception of Bronze Age art in the region (Coles 1995). His work in this field resulted in publications of major importance: *Images of the Past* (1990a), *The Rock Carvings of Uppland* (1994), *Patterns in a Rocky Land* (2000) and *Shadows of a Northern Past* (2005). They are regarded as textbooks, both for professionals as well as reaching a broader audience.

During his research on Scandinavian rock carvings, John was admired for his sense of direction in the rocky terrain, strewn with local roads. He could memorize a map after having one look at it. When navigating the area on foot or by car, he always seemed to find the right rock formation with prehistoric carvings. He was very popular and made many friends among his Swedish and Norwegian colleagues. He was also a particular friend of the Department of Archaeology and Ancient History of Uppsala University. His obituary on the university's website (www.arkeologi.uu.se) is a testimony to the popularity and respect he enjoyed there. His poems devoted to rock carvings (Coles 2019: 112–113) demonstrate his emotional attachment to the subject. In 2009 he was awarded an honorary doctorate by Uppsala University and a prize for excellence from the Royal Swedish Academy of Letters, History and Antiquities.

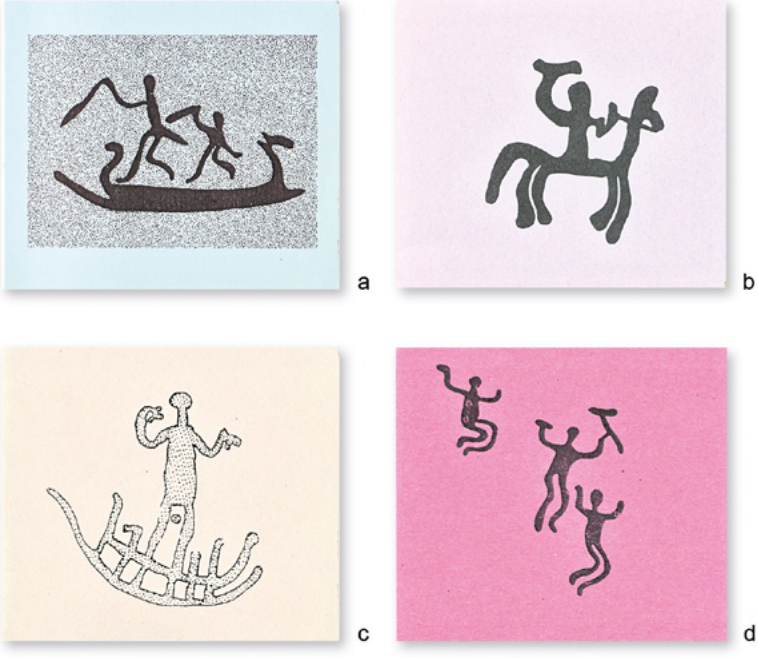

Fig. 5. Selection of holiday cards sent to the authors by John and Bryony Coles. Drawings of the Scandinavian (Sweden, Bohuslän province) rock engravings by John Coles:
a – Backa; b – Tanum parish; c – Hogdal; d – Torp.

Over the years of our correspondence, John and Bryony sent us holiday postcards, often adorned with John's drawings with motifs from prehistoric Scandinavian rock art (Fig. 5). Professor Aidan O'Sullivan's memorial (2020: 9) indicates that others also received John's small pieces of art.

From the very beginning of his time at Cambridge, thanks to Grahame Clark, John participated in editorial work on the *Proceedings of the Prehistoric Society*. Brian Fagan (2001: 185), a student at Cambridge University and today Professor Emeritus of Anthropology at the University of California, Santa Barbara, emphasized that:

> "…Clark's lifelong concern was with the Prehistoric Society. His record of attendance at meetings was virtually continuous, his editing of the *Proceedings* by this stage an integral part of his professional life. John Coles, then assistant editor, recalls editing and completely rewriting papers with Clark as they travelled to and from London in the train".

Between 1970 and 1979, John was Editor of this renowned archaeological journal, which provided him with the opportunity to collaborate with some of the most eminent scholars of that time, and from 1978 to 1982 he served as President of the Prehistoric Society. Later in his career, he established the 'John and Bryony Coles Bursary (Student Travel Award)' to help student members of the Society to travel abroad.

John received a number of medals and other honours in Britain and abroad, in addition to those already mentioned. They include Honorary Memberships of the Institute of Field Archaeologists (1991) and the Society of Antiquaries of Scotland (2000), and the Royal Irish Academy (2005). He was awarded the Grahame Clark Medal of the British Academy (1995), the Gold Medal of the Society of Antiquaries (2002), the European Archaeology Heritage Prize (2006), and the Rajewski Medal of the State Archaeological Museum in Warsaw (2007).

To this day, we are left wondering, how was it possible that John could remain so active in various fields of archaeology and still be able to help colleagues at home and abroad. We have already mentioned Scotland. But Ireland was no less important. Prof. Aidan O'Sullivan (2020: 9) recalls:

> "He was a strong supporter of archaeology in Ireland, acting as External Examiner in University departments in Dublin, Galway and Cork. He encouraged the development of wetlands archaeology here and was a friend of Prof. Barry Raftery… John was an Honorary Member of the Royal Irish Academy in Ireland".

He was also a highly regarded advisor dealing with wetland archaeology all over the world. As mentioned above, he was awarded the European Archaeological Heritage Prize, and truly one can hardly think of a more worthy recipient.

One must also mention John's and Bryony's connection to Poland. It all began in 1984. The exhibition "Biskupin: Poland's Iron Age Lake Village" prepared by the Biskupin Museum, a Department of the State Archaeological Museum in Warsaw, was on its United Kingdom tour. Following shows in the Weald and Downland Open Air Museum in Singleton, the Norton Priory Museum in Runcorn, the Museum of Archaeology in Durham and Edinburgh University Library, from November 1st, the exhibition was on display at the University Museum of Archaeology and Anthropology in Cambridge (Piotrowski 1985). This is where I [W. Piotrowski] met Professor John Coles, who presented me with the Polish edition of his first book on experimental archaeology (Coles 1977), with an appropriate dedication.

Over the course of various archaeological projects in Biskupin, three years later we realized how beneficial it would be for our wetland site to be able to take advantage of John and Bryony Coles' knowledge. They accepted our invitation and arrived in Biskupin in August 1989. Their short stay allowed our guests to familiarise themselves with the basic problems of the site, to visit the Neolithic burial complex with long barrows in Wietrzychowice and to take a ride on the narrow gauge railway from Biskupin to Żnin. We agreed to continue our cooperation and John became our advisor on wetland archaeology. A year later W. Piotrowski took part in a WARP conference devoted to waterlogged archaeological wood organised by John and Bryony together with Mike Dobson (Coles J. *et al.*, 1990; Piotrowski 1990).

On April 5–7 1991, at the University of Exeter, the Prehistoric Society and WARP held an international conference "The Wetland Revolution in Prehistory", organized by John and Bryony. More than 20 speakers from all over the world (including Poland) presented the problems and successes of wetland archaeology in their countries (Piotrowski 1991-1992; Coles B. 1992), making it a truly stimulating meeting. In the summer of the same year, the State Archaeological Museum in Warsaw, with its Department in Biskupin, invited John and Bryony to come to Poland once more. Their visit proved very fruitful for the Lake Biskupin peninsula and its prehistoric remains. Under the guidance of and with active participation of our English friends, we managed to install the first monitoring tubes within the waterlogged layers of the site (Figs 6 and 7). This was the beginning of the Biskupin monitoring complex, later developed by Dr Leszek Babiński of the Biskupin Conservation Waterlogged Wood Laboratory. Later on came an excursion to Izdebno, the aim of which was to familiarise our guests with the big fortified settlement erected by the Lusatian Culture community. We then travelled to a swamp/bog area in the Biebrza river basin and the town of Łomża, where Bryony went beaver spotting by the Narew river (Fig. 8), and to Białowieża Primeval Forest and the towns of Ciechanowiec, and Nowogród on Bug river, the island on Lednica Lake known as Ostrów Lednicki with its ruins of the first seat of the rulers of Poland and an early medieval fortified settlement (we were given a guided tour by our colleague Jacek Wrzesiński), and Łekno, with remains of

Fig. 6. Biskupin 1991. The remains of the fortified settlement of the Lusatian Culture, site 4. John and Bryony Coles inserting monitoring tubes. Photo by W. Piotrowski.

Fig. 7. Biskupin 1991. The remains of the fortified settlement of the Lusatian Culture, site 4. John and Bryony Coles taking samples of archaeological waterlogged wood. Photo by W. Piotrowski.

Fig. 8. Environs of Łomża town, (NE Poland) 1991. The Narew river. Bryony and John Coles spotting beavers. Photo by W. Piotrowski.

an early medieval stronghold and the oldest Cistercian abbey in Greater Poland (1153), where we were cordially received by Dr Andrzej Marek Wyrwa and members of his excavation team (Figs 9 and 10). This way new friendships were formed.

In April of 1997, to mark the 65th birthday of John Coles, a conference titled *From Somerset to Simris* was organized in Exeter by Professor Anthony Harding, with the active participation of the Prehistoric Society. Representatives of the Biskupin Museum (W. Piotrowski and W. Zajączkowski) presented him with a birthday present of a replica of a Bronze Age sword, which was met with great applause from the participants (and Bryony reports that John later had difficulty keeping it out of the hands of one young member of the family). The conference resulted in the publication of *Experiment and Design. Archaeological Studies in Honour of John Coles*, (see Fig. 3e), edited by the organizer of the conference, John's friend and former student Professor Anthony F. Harding (1999).

Between September 13th and 21st 1997, the third Biskupin Archaeological Festival took place – *Man and woman in the Past* – with John and Bryony Coles as guests of honour. They took part in the British Day (Fig. 11) and in the evening they delivered a lecture dedicated to wetland and experimental archaeology. John addressed issues in wetland archaeology around the world, the basis for the article already mentioned above, written for *Archaeologia Polona* (Coles 1997-1998).

Fig. 9. Łekno (NW Poland) 1991. Early medieval settlement complex. From left, Dr A. M. Wyrwa – director of the archaeological excavations; John and Bryony Coles in the middle. Photo by P. Namiota. From the archives of the "Łekno" Archaeological Expedition.

Fig. 10. Łekno (NW Poland) 1991. Early medieval settlement complex. From left, Bryony and John Coles, Danuta Piotrowska and Walenty Szwajcer – discoverer of the prehistoric site at Biskupin in 1933. Photo by P. Namiota. From the archives of the "Łekno" Archaeological Expedition.

Fig. 11. Biskupin, 20 September 1997. *The British Day*. John and Bryony Coles as special guests of the 3rd Archaeological Festival *Man and Woman in the Past* (13–21 September). Photo by W. Piotrowski.

For the next ten years, we kept up correspondence, discussing wetland archaeology and the conservation of waterlogged wood, and when one of us worked on papers for an issue of *Archaeologia Polona* in English, John was kind enough to provide stylistic revisions of the English translations (Piotrowska 1997-1998: 281; 2004: 286).

On 23–25 May 2007, the International Symposium *The history of archaeology and archaeological thought in the 20th century*, dedicated to Professor Grahame Clark on the centenary of his birth, and on the 50th anniversary of the Polish edition of Clark's *Prehistoric Europe: the economic basis*, was held at the Archaeological Museum in Biskupin (Piotrowska and Piotrowski 2009). Prof. John Coles was the Honorary Chairman of the Symposium Organization Committee. He arrived with Lady Mollie Clark, Professor Clark's widow and their son Philip. Our guests received a medal commemorating Professor Rajewski, presented by Dr W. Brzeziński, director of the State Archaeological Museum in Warsaw (Piotrowska and Piotrowski 2009: 257; Lech 2010: 177-179). John and Bryony Coles were among the eminent speakers. John delivered the opening lecture *Grahame Clark, Cambridge and the World*, and Bryony the lecture *Grahame Clark and the Stone Age Hunters*. The results of the Symposium were published as *Grahame Clark and His Legacy* (Marciniak and Coles

eds 2010), including, among others, a paper by John dedicated to Grahame Clark (Coles 2010).

Professor John Coles was an archaeologist of broad interests and outstanding achievements in various disciplines of British, European and world archaeology. He was involved in prehistory from the Palaeolithic to the Iron Age. Although experimental archaeology had been long practised in Great Britain, he shaped it through his works into a major specialisation in prehistoric research (Coles 1973; 1979; cf., Renfrew and Bahn 1991: 45 and 286–287). With his wife Bryony he contributed to wetland archaeology, which became one of the key concepts in archaeology globally. He also had numerous important achievements in the studies of the Bronze Age, prehistoric art and environmental archaeology.

The symposium in Biskupin in 2007 was the last time we saw John and Bryony Coles, although we later stayed in touch. John received and reviewed *Prolegomenon on the Archaeology of Biskupin. Volume I. An Archaeological Bibliography of Biskupin 1933-1983* (Coles 2009), not to mention the exchange of many letters and postcards (Figs 12 and 13).

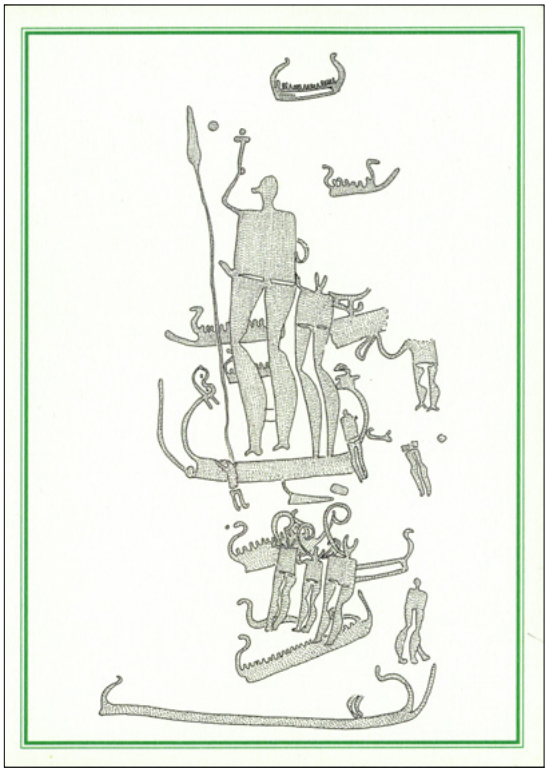

Fig. 12. Holiday card from John and Bryony sent to the Authors of this article with John`s drawing of rock-carving at Kalleby, Bohusläin, Sweden.

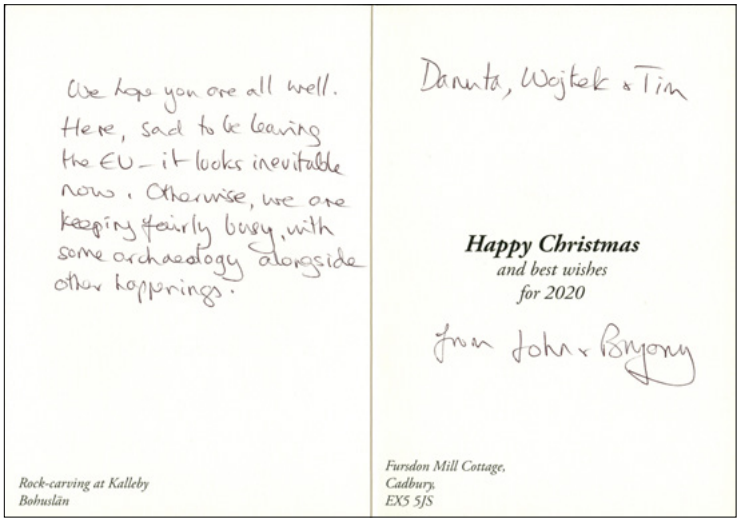

Fig. 13. Holiday card from John and Bryony sent to the Authors of this article with Christmas 2019 greetings and best wishes for 2020.

The message from Bryony about John's passing on 14 October 2020 in his Fursdon Mill Cottage, Devon, affected us greatly. Thank you, dear John, for your friendship. You live on in our memory.

ACKNOWLEDGEMENT

We are profoundly grateful to Professor Bryony Coles for information about John that was used in this article.

Translated by Tymoteusz Piotrowski

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BOOK REVIEWS

Gabriela Blažková and Kristýna Matějková (eds), *Europa Postmediaevalis 2018. Post-Medieval Pottery Between (its) Borders*. Gloucester 2019: Archaeopress, pp. 297, colours illustrations

Reviewed by Magdalena Bis[a]

The reviewed publication, published in 2019 by the British publishing house Archaeopress, is a collection of texts based on papers and posters presented at the international conference under the same title held in Prague in April 2018. This meeting brought together archaeologists from many European countries – including Croatia, Czechia, Germany, Norway, Poland, Portugal, Russia, Slovakia, Switzerland, Italy, and Hungary – who conduct research on the early-modern period and the pertaining material culture. Both this event and the book in question were a response to the needs of the academic community, due to the ongoing development of historical archaeology in Europe and an increase in research on artefacts and other evidence recovered during fieldwork related to this. The time-frame of the *post-medieval period* differs slightly across particular European countries, encompassing artefacts from between the 15th and 18th centuries.

The contributors focus on the most common items found at archaeological sites of the period, i.e., ceramics, particularly vessels and tiles. The work under discussion demonstrates how heterogeneous these finds are, how many unanswered questions they provoke, especially regarding their production, exploitation, and trade, and at the same time what progress has been made in these fields of research, but also what remains unclear and in need of further studies.

The book consists of 24 articles preceded by a "Preface". The papers are grouped into four thematic sections: 1. "Pottery throughout Europe" (includes 7 texts), 2. "Pottery production and decoration" (7 texts), 3. "About stove tiles around Europe" (6 texts), 4. "Varia" (4 texts). In terms of topics, the majority of the texts are devoted to ceramics of average quality, such as kitchen- and tableware, commonly used in various countries

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of our continent. This is an undeniable value of the publication, as it provides a window into the realities of household pottery exploitation in the early-modern period as well as the variety of types, styles, and assortment. The volume includes also texts on more luxurious vessels (Chinese porcelain) and utensils serving unusual purposes (toys, measures for grain used in trade, and clay lids for metal cauldrons). Only the last of the published papers is not related to the main topic of the publication, but nevertheless falls within the scope of historical archaeology – it is dedicated to fortifications built in the Czech lands during the Thirty Years' War.

The contributions cover a broad territorial range, including finds from distant regions – from Norway to Portugal and from Germany to Russia. They include both broad-based comparative studies, summarising the results of analyses of numerous collections, often of a wide geographical distribution, and narrower ones, focused on selected smaller groups of finds.

In the introduction, the editors of the volume – Gabriela Blažková and Kristýna Matějková – explained why and how the conference (and its subsequent publication), was initiated and organised. In organising this meeting, their basic intention was to create a platform which would bring together researchers dealing with the archaeology of the early-modern period both in the Czech Republic and other areas of Europe, thereby creating a place where experiences from narrow specialties could be exchanged. They aimed in particular to gather researchers dealing with post-medieval ceramics. This has been a topic long neglected in the field of European archaeology, and there has only been dynamic development in the recent few decades.

The first part of the publication includes studies that encompass many types of post-medieval ceramics found across various sites. This allowed for adopting multiple approaches and tracking diverse trends in the consumption of these products. It opens with an article titled *Pottery Use and Social Inequality in Mid-18th Century Lisbon. An Initial Approach* by a quartet of authors – Tânia Manuel Casimiro, José Pedro Henriques, Vanessa Filipe, and Dário Neves (Portugal). The aim of the researchers was to compare finds from three sites in the Portuguese capital reflecting different social environments – a poor house, a middle class dwelling, and a palace belonging to a noble family. All of these buildings were destroyed at the same time – by an earthquake followed by a tsunami and a fire on November 1st, 1755. The forms and shapes of the recovered vessels – tin glazed ware, redwares, glazed wares, porcelain, and stoneware – as well as their functions were presented. The similarities and differences between the collections were scrutinised, thus reflecting, among others, the wealth of inhabitants and their food processing and eating habits (see also Casimiro *et al.,* 2018).[1]

[1] I am only providing here examples and the latest publications tackling the presented issues. A complete list of literature is provided after each article.

Marcella Giorgio (Italy), tackled the issue of *The Production and Export of Pisan Pottery in the 16th and 17th Centuries*. She focused on various aspects of the evolution of late archaic majolica and different types of scraffito slipware – *a punta*, monochrome slipware, *a stecca*, and *a fondo ribassata* created in local workshops. These vessels were ornamented, inexpensive, and produced in large quantities, mainly as bowls, dishes, basins, and jugs. The author described their relationship to other contemporaneous kinds of ceramics from the Florentine area and outlined the directions and scope of their export (see also Giorgio 2018).

The cross-border transfer of technology is the leading subject of the article by Eva Roth Heege (Switzerland), *A Potter's Workshop from the Renaissance Period at Zug. Swiss Faience Production in the Second Half of the 16th Century*. The reason for her considerations was a discovery of the remains of a pottery kiln in Zug, operating from the mid-16th to the beginning of the 17th century, as well as the ceramic artefacts found there. The author, among other things, verified the origins of early earthenware and owl-shaped vessels, previously considered to be imports in Switzerland. Their production by local artisans is a testimony to the application of international trends and innovations in local pottery industry (see also Roth Heege 2017).

Ladislav Čapek and Michal Preusz (Czech Republic) examined *Changes in Pottery Production, Distribution and Consumption in the Post-medieval Period in South Bohemia* and, above all, the processes of continuity and discontinuity occurring in the investigated area from the mid-15th century to the mid-17th century. This was manifested by the introduction of new forms of vessels, a proportional decrease in greyware coinciding with an increase in vessels fired in the oxidising atmosphere and glazed on the inside, and the appearance of foreign products such as goblets from Loštice, German stoneware, slipware, faience, etc. (see also Čapek and Preusz 2016).

Post-medieval Pottery from Small Townships of Gdańsk Pomerania. A Preliminary Evaluation was discussed by Michał Starski (Poland). He characterised pottery from the 16th to 18th centuries found in Puck, Lębork, Chojnice, Człuchów, Gniew, and Skarszewy in terms of morphology and technology, broken down into types, local and foreign products, and taking into account the transformations in the assortment of ceramic vessels in use. The author emphasised the possibility of researching selected cultural and economic processes on this basis, including changes in consumption styles, or the marginalisation and elimination of local pottery craftsmanship (see also Starski 2018).

On the other hand, Volker Demuth (Norway), *Post-medieval Pottery in Norway - an International Affair*, described types of products from the 16th and 17th centuries obtained in the town of Bergen: decorated earthenware, including Weserware and Werraware, tin-glazed ware, glazed earthenware, stoneware, and stove tiles. The author stressed their significance mainly for research into international trade networks, cultural exchange, and migration in early-modern Europe (see also Demuth 2019).

Mariana Alameida and Jaylson Monteiro (Portugal) discussed *The Pottery Assemblage from the Trinidade Archaeological Site, Santiago Island, Cabo Verde*. The collection includes vessels from between the 16th and 18th centuries, used mostly in the production of sugar and other sugar cane products. These are, for instance, sugar loaf moulds, some of which bear potter's marks. They were dominated by items imported from the European continent (Portuguese, Dutch, and Italian), but African products were also present.

The articles grouped in the second part of the book (with the exception of the article about Chinese porcelain imported to modern-day Hungary) concern several categories of products – representing similar average level of local workmanship – which were often widely distributed. Three of them are devoted to vessels referred to in the archaeological literature as s*lipware* or *Malhornware*. In the first, by Andreas Heege (Switzerland), *Springfederdekor - Chattering - Décor guilloché - Hemrad dekor. The History and Development of a Decorative Technique Found on 17th- to 19th- Century Earthenware Ceramics from Scandinavia, Poland, Germany, Switzerland, Austria and Lichtenstein*, a decoration method was presented using numerous items collected in various regions of Europe. It comprises an analysis of how the spread of ceramics decorated in this way relates to its origin and provenance, the adaptation of decorations to local standards of pottery production, and the flow of ideas in Europe at that time (see also, e.g. Heege and Kistler 2017).

Two subsequent texts discuss results of studies on analogical pottery from the territory of Bohemia, dated to between the 16th and 18th centuries. Gabriela Blažková (Czech Republic), *Painted Pottery in Bohemia. Slipware of the 16th and the 17th Centuries*, focused on the morphology and a method of decorating vessels, corresponding to the European standards of the time. The main types of items registered were bowls, jugs, and pots of various shapes and sizes with decorations painted in white and green, sometimes also engraved, with dominant geometric motifs, used next to plant and anthropo- and zoomorphic patterns. Due to the colour of the bodies, the products were divided into two groups – red and white. The former were manufactured in the town of Beroun, near Prague, a famous pottery centre flourishing c. 1600, while the vessels representing the latter group were most likely produced in the region of Upper Lusatia (see e.g., Blažková 2018).

Kristýna Matějková (Czech Republic) tried to answer the question asked in the title of her contribution –*Bohemian Slipware from the Second Half of the 17th Century until the End of the 18th Century – a Lost Tradition?* Her research was hampered by the fact that most finds were preserved in fragments only and information about production workshops of that time was scarce. The analyses were based on artefacts from Prague. The author concluded that Bohemian slipware in that period declined in popularity and became a solely regional product (manufactured in smaller pottery centres, such as Levín, because production in Beroun discontinued) catering for the

needs of recipients outside the urban contexts. These vessels have more simplified decorations in terms of design and technique (e.g., splashing, dripping, and marbling) than those used in the Renaissance (see also Matějková 2018).

The phenomenon of high demand for and wide spread of another type of ceramics – the so-called white pottery between the mid-16th and the mid-17th centuries in Poland was investigated by Magdalena Bis (Poland), in a text entitled *White Pottery in Early Modern Poland: Local Production or Regional Fashion?* The author discussed the factors behind this favourable economic situation, such as the appropriate functional features of the vessels, their more attractive appearance compared to those of redware and greyware, accessibility to middle-class recipients, manufacturing possibilities at the time (appropriate raw material base), and distribution (especially by waterways) (see also Bis 2014).

On the other hand, the issue of continuity of production and popularity of greyware in the 16th to 18th centuries in Masovia and Podlasie was addressed by Maciej Trzeciecki (Poland), *'Medieval' Greyware in Post-medieval Northeast Poland. Backwardness or Genius Loci*? These products, of late-medieval origin, are considered to be a material manifestation of the social-cultural changes occurring in the process of town location under the German law in Poland. As has been shown, these vessels were readily acquired and used in the area under discussion. Analysis shows a variable frequency of the finds, their formal and stylistic transformations, as well as the interaction between a town and its settlement hinterland (see e.g., Trzeciecki 2017).

Ricardo Costeira da Silva (Portugal) concentrated on *Lead-Glazed Ware from Coimbra: 1550-1600*, a kind of pottery manufactured in the town of Coimbra in the 16th century exclusively by local craftsmen called *Malegueiros*. The author discussed the specificity of these vessels as reflected by a collection from the old Episcopal Palace of Coimbra and data from written sources from the era. The vessels were made of ferruginous clays and covered with a brown-honeyish lead glaze on the entire inner surface and partially on the outside, but they were otherwise undecorated. Their assortment was limited to cooking pots with one or two handles, jugs, double-handle saucepans, skillets, or frying-pans (see also Silva 2018).

In terms of provenance and quality, Far Eastern porcelain vessels differ from the artefacts presented in this part of the publication. Their analysis was discussed by Tünde Komori (Hungary) in *The Topographical Distribution of Chinese Porcelain Sherds in Ottoman Buda and Eger Castle and its Implications*. These are vessels imported to these centres during the Turkish occupation (1526–1699), manufactured in China during the Wanli and Kangxi dynasties, and fired in the private kilns of Jingdezhen. Their quality and value were indeed lower than in the case of the products of the imperial kilns, but in Hungary they were considered luxury items and indicators of the high status of their users – mainly Pasha and Ottoman officials. The analysis of distribution of selected types of products was used to reconstruct the settlement of

the town of Buda and the castle complex in Eger during the 16th and 17th centuries (see also Komori 2014).

The third part of the publication features studies devoted to plate tiles and tiled stoves, approached primarily as an important element of interior decoration, a medium for artistic expression, as well as statements of aspirations and social identification. It opens with a text by Olga Krukowska (Poland) on *Heraldic Stove Tiles from Gdańsk*. The researcher presented artefacts from the 16th and 17th centuries from this Baltic centre and compared them to similar specimens from other Polish collections. Most of the items were decorated with the coat of arms of Gdańsk. Some of them bear the image of a single-headed eagle – the emblem of the Kingdom of Poland – or a double-headed eagle symbolising the Kingdom of Prussia. There is a unique tile with the coat of arms of the Italian house of Sforza, i.e., family of Bona d'Aragona, wife of King Sigismund I of the Jagiellonian dynasty since 1518 (see also Babińska 2009).

Martina Wegne (Germany) in his *Saxon Stove Tiles Among the Priorities of 3D Scanning and Bohemian Portraits* outlined the possibilities offered by application of modern visualisation methods in reconstruction of the tile manufacturing process, which led to revealing details obscured by the covering layer of glaze. It was applied to the stove tiles discovered in Leipzig in the remains of a pottery workshop from the turn of the 16th and 17th centuries, and depicting important personalities of that time – Czech monarchs, probably Władysław II Jagiellończyk or his son, Ludwik II, as well as Ferdinand I and his wife, Queen Anna Jagiellonka, and besides them, count Stefan Schlik and the reformer Jan Hus.

Michaela Balášová and Markéta Soukupová (Czechia) focused on *Replication of Renaissance Motifs: from Aristocratic Terracotta to Burgher House Stove Tiles* on the basis of example of furnishings of the Chomutov Castle in the 16th century. They compared patterns decorating terracotta blocks and stove tiles while analysing possible sources of inspiration for manufacturers and identifying available analogies. It is also a reflection on the dissemination of decorative motifs in the Renaissance era, taken from the printed works of the so-called 'Little Masters' and reproduced in different branches of contemporary craftsmanship discussed here (see also Balášová 2009).

Ornamentation of tiles and stoves assembled from them is also a prominent problem engaged by Ivana Škiljan (Croatia) in her *Early Modern Period Stove Tiles from Slavonia*. An analysis conducted by the author indicated that the 16th- and 17th-century tiles from this area were distinguished by a rich set of ornamental motifs, usually included in architectural elements (pillars, arcades, or frames). These are mainly allegorical and biblical scenes, portraits of contemporary characters, or mythological figures. Various cultural traditions and technical innovations have influenced the development of this field of production within the borders of modern-day Croatia (see also Škiljan 2015).

Another text was contributed by three researchers – Ksenia S. Chugunova, Irina A. Grigorieva, and Roxana V. Rebrova (Russia) – and is titled *A Multi-Analytical*

Comparative Examination of 18th-Century Dutch Tiles and Russian Imitations. Preliminary Results. It was devoted to archaeometric analyses using the OM, XRF, SEM-EDS, and RS methods and scrutinised their usefulness in determining the provenance of ceramic wall tiles. Specimens found in St. Petersburg, in the Winter Palace of Peter the Great and the Menshikov Palace, which were attributed to Dutch (Amsterdam, Rotterdam, Utrecht and Harlingen) or Russian (Strelna) factories, were examined. As a result, several features were selected to enable distinguishing foreign products from their local imitations.

The same issue is addressed in an article by Roxana V. Rebrova (Russia) who presented *Typology of 18th-Century Stove Tiles from the Historical Centre of St. Petersburg.* The author managed to specify, among other things, the characteristic features of the tiles used in the construction of stoves during the initial period of urban expansion. They were intermediate products between the 'old Russian' stove tiles and St. Petersburg items, imported from other centres, and displaying a small relief and a high back rim. Other, separate types of St. Petersburg tiles produced in that century were also listed – smooth green monochrome, smooth white, and smooth cobalt with different patterns. Some were ordered in Poland or Germany; others were probably painted on the spot by foreign artists.

Studies of artefacts made of clay, but serving different purposes, fill the fourth part of the publication – "Varia". One of the most intriguing ones are mugs with similar shapes, manufactured using the same technique, with markings on the outer surface, differing in capacity (from approx. 0.05 litres to approx. 1.2 litres). They served as trade measures in the port of Lisbon. In an article dedicated to them, titled *Size Does Matter. Early Modern Measuring Cups from Lisbon* and contributed by Tânia Manuel Casimiro and António Valongo (Portugal), introduction of the standardised ceramic measuring cups was associated with regulations in the system of weights and measures in Portugal taking place from the beginning of the 16th to the second half of the 19th centuries.

Ceramic Toys and Miniatures from the 16th–18th Century Found in Lisbon is a topic discussed by three researchers – Mário Varela Gomes, Rosa Varela Gomes, and Tânia Manuel Casimiro (Portugal). Apart from whistles and anthropo- and zoo-morphic figures, there are also tiny ceramic vessels imitating the shape of their full-size models – cooking pots, chaffing dishes, jars, bowls, and cups. These items are usually interpreted as toys, essential tools in the process of children's education. However, it is possible, as the authors suggest, that they had a different function as well, for instance as containers for expensive or rare cosmetic specifics, medicaments, or served as representative miniature items made by craftsmen (see also Mills 2015).

On the other hand, *Lids Made of Brick Clay from Wittenberg and Central Europe - a Mysterious Type of Archaeological Artefact from the Late Middle Ages and Early Modern Period* are discussed by Ralf Kluttig-Almann (Germany). Such products were

manufactured by brickmakers, massive and flat, with double-shaped edges, large handles, and oftentimes – decorations. Finds of this category from Wittenberg were a starting point for an analysis of forms and verification of the use of such products throughout the 12th to 17th centuries, also known from other Central European countries. The author suggested that these lids were used to cover bronze vessels – tripods used as cooking utensils (see also Kluttig-Altmann 2015).

In the next article, *The Bohemian Bitter Water Trade, 1721–1763*, Patrick Schlarb (Germany) addressed the problem of terminology used in relation to healing water and mineral water. He emphasised the need to distinguish between these products – with different properties, intended for distinct markets and for other recipients. He presented the history of the discovery of valuable bitter water springs, in 1717 and 1725, respectively, in the Czech towns of Sedlec (Sedlitz) and Zaječická (Saidschitz) as well as their exploitation and distribution in the 18th century. He also discussed markings used on stoneware bottles for the transportation of healing water (see also Schlarb 2018).

The book closes with the text by Václav Matoušek (Czech Republic) concerning *Field Fortification from the Thirty Years' War in the Czech Lands in the Field and in Period Engravings.* The author considered several battle sites – between Rozvadov and Waidhaus (1621), the siege of Tábor (1621), battle of Přísečnice (1641) and at Třebel (1647) – and two Swedish military camps – in Stará Boleslav (1639–1640) and Horní Moštěnice (1643). He compared the elements of the fortifications erected there – their size and distribution depicted on iconographic sources from the era – with the present state of their preservation, relics discovered during contemporary field research, and data obtained with the use of aerial imaging and the LiDAR technology (see also Matoušek *et al.*, 2017).

The electronic version of the publication is expanded by including five posters presented at the conference that were not developed into papers.

The reviewed book confirms the multifarious importance and usefulness of ceramics in the process of comprehensive reconstruction of the past reality. This category of finds witnesses the state of development of pottery-making in the early-modern period – it comprises utility items, goods circulated in local and supra-regional trade, valuables, means of artistic expression, elements of social, ethnic, and cultural identification, and material evidence of cultural changes. The texts also confirm the circulation and prevalence of specific technical solutions and trends in ceramic production across the European continent, as well as shed light on development of similar aesthetic preferences among users. Thus, they also pave the way for investigating demand, supply, and fashion of the period. At the same time, this diversity reflects a broad spectrum of issues that are currently being examined through the study of modern ceramics by European researchers active in the field.

The literature cited in the work is extremely useful, especially the latest publications; it is a basic, up-to-date bibliographic list, an excellent vantage point for comparative

research. On the other hand, carefully selected illustrative material of appropriate quality is a valuable supplement to the presented content and descriptions of artefacts.

Although similar meetings are regularly organised in other European countries, for instance on the Baltic coast, lately in Estonia ("Meetings of Baltic and North Atlantic Pottery Research Group"), in Germany ("Internationales Symposium Keramikforschung"), Poland ("Porcyllena, farfury i glina… Nowożytne naczynia ceramiczne jako źródła archeologiczne" – „Porcelain, faience and clay… Post-medieval ceramic vessels as archaeological sources"), or Italy ("Convegno Internazionale della Ceramica"), the Prague conference has a chance to integrate an international group of researchers and provide them, according to the initial idea, with an excellent forum for exchange of experience and knowledge. And the reviewed book may enter the canon of obligatory reading for archaeologists dealing with the early-modern period and ceramics from that time.

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Three Publications about Archaeology of a Segment of the First World War's Forgotten Eastern Front: Zalewska, A. I. (ed.), *Archeologiczne Przywracanie Pamięci o Wielkiej Wojnie w rejonie Rawki i Bzury (1914–1915),* Warszawa 2019: IAE PAN, 420 pp., illustrations, ISBN 978-83-66463-01-1; Zalewska, A.I., Czarnecki, J. and Kiarszys, G., *Krajobraz Wielkiej Wojny: Front nad Rawką i Bzurą (1914–15) w świetle teledetekcji archeologicznej i źródeł historycznych*, Warszawa 2019: IAE PAN, 147 pp., illustrations, ISBN 978-83-66463-01-1; Zalewska, A. I. (ed.), *Archeologia Frontu Wschodniego Wielkiej Wojny i dziedzictwo konfliktów zbrojnych jako wyzwanie poznawcze, społeczne i konserwatorskie*, Lublin 2021: UCMS, c. 420 pp.,[1] illustrations, ISBN 978-83-947370-2-3.

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While the horrors of the trench warfare on the Western Front in Belgium and France are part of the European cultural memory, to some degree the much more extensive and mobile Eastern Front of the 1914–1918 conflict has become the forgotten front (*Die vergessene Front*). Although for just over eleven months in 1914/15, the central part of a major front, some 1000 km long on which three million people died ran through the middle of what is now Poland, for a number of reasons the memory of this has there been all but erased from memory and from the cultural landscape.

The reviewed three volumes are the result of a project that has attempted to address the poor state of historical memory of the momentous events and human drama that took place a century earlier on the segment of the front, 55 km west of Warsaw. Here, from mid-December 1914, the Russian Imperial army tried to hold back the eastward advance of the German troops on defences built along the Bzura and Rawka rivers. For the next seven months, the fighting here took the form of the same type of prolonged static trench warfare more familiar on the Western Front (the only place in the eastern sphere of war that this happened). The German army made every effort (including mining and several major gas attacks), to advance on Warsaw but failed to

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[1] The publication of this volume has been delayed, this review has been based on the proofs where the final pagination had not been not determined.

break through. It was only after the Great Retreat of the Russian army in the summer of 1915 that these defences were overrun and Warsaw fell.

A few weeks later, the front had advanced 340 km further eastwards into Russian territory. In the former Bzura and Rawka conflict zone, now under German administration, the local inhabitants soon started to come back and the slow work of reconstruction and repair of war damage could begin. The whole area was covered in deep trenches and craters, while unexploded ordinance and damaged equipment littered the region of the former front line. Some villages had to be rebuilt, others were abandoned. Cemeteries and unburied remains of those lost in action were also a feature of the new landscape.

It was this landscape that was studied by the 2014–2018 APP research project ("Archeologiczne Przywracanie Pamięci o Wielkiej Wojnie", further APP project [Archaeological Restoration of the Memory of the Great War]), directed by Dr Anna I. Zalewska, which aimed to examine the "material remains of life and death in the trenches on the Eastern Front and the state of transformation of the post-battle landscape in the Rawka and Bzura region (1914–2014)". These aims were achieved by multi-disciplinary research using a range of source material, including contemporary written sources (diaries, old documents), iconographic material (old photos, aerial photography, contemporary field maps) and above all the results of modern teledetection (LiDAR survey, aerial photography) and targeted excavation.

The area studied was some 400 km^2, through which passes a 19 km section of trench systems belonging to this section of the front – roughly between Sochaczew and Skierniewice. The project examined both the German and Russian front lines, with the no-man's land between them, and also part of the line of the infrastructure and rear defences of both sides. The reports look in detail at five nodal areas (I–V) of the section of front where the landscape changes caused by military action were most radical. The southernmost (Joachimów-Mogiły, near the motorway service station of that name) lies in a forested region (Bolimów Forest landscape park) and contains one of the best preserved complexes of fortifications of 1914–1915 in this part of Europe. The second (the vicinity of Wola Szydłowska) lies to the north of the modern A2 motorway that now bisects the research area, and like the other four is mostly now agricultural land. Just to the north of that is the third nodal region in the region of the village of Humin and "Hill 95". Area IV lies near the hamlet Borzymów, and the fifth lies at a greater distance near the Bzura river in the region of Zakrzów.

The project had three underlying aims. The first was to restore the memory of the eastern front of World War I in the region of the Bzura and Rawka 100 years ago and bring it back into public awareness, but also to allow the re-examination of our views on the characteristics, significance and consequences of this military action. The second aim was to expand knowledge on the life and death of the soldiers in the trenches, and the third aim was through drawing attention to the material traces,

stimulate reflection on human conflict in general. The fruits of the Project have been a number of articles by the principle authors in various publications and the three monographic publications reviewed here.[2] Although the latter form a trilogy, each volume addresses a separate aspect of the results of the project.

The first volume sets out the context, aims, scope and methodology of the APP project, some of its results, placing them in a wider setting. It contains 26 papers by various authors arranged in four blocks. It commences with several chapters built around the documentary sources placing the battlefield landscape of the Bzura and Rawka region into a wider context. A historical introduction outlines how earlier events had led to the formation of a static line of trench warfare in the area of these rivers. Here is summarised the various military actions that took place in specific regions of the front (including the six nodal areas) in the winter of 1914 and first part of 1915. This is followed by several papers on the aspects of the fighting itself and life on the front line. The first is an extremely interesting presentation using a well-researched substantial body of archival sources to show the life of the soldiers of the German and Russian armies in the Battle of Rawka and Bzura "from mobilisation to the list of losses" by local amateur historian and militaria collector Stanisław Kaliński (pp. 43–80). In fact, the numbers of deaths are totally unknown, as is the answer to another question that concerns the authors, how many Poles were fighting (and died) in the two opposing Imperial armies.

Stanisław Kaliński is also the author of the subsequent text (pp. 81–97) using archival material and detail from the military handbooks of the day (which the APP investigations showed were not always followed) and the archaeological evidence to discuss the use of mining underneath the opposing trenches in order to plant explosive charges. Unfortunately, traces visible on the surface betray a part of the trench layout that may be counted on to have been suddenly abandoned after the explosion with everything that was in it, and it was found in one case ("Crater 226", p. 83), that recent artefact hunters with metal detectors had already illegally emptied the area of most finds. The third paper (Anna I. Zalewska, pp. 99–112) considers the horrific aftermath of the use on this section of the front of chemical weapons of mass destruction by the German army. In January 1915, the German army experimented with gas shells and this was later followed (31 May 1915, 12 June and 6/7 July 1915) by chlorine attacks. In the first of these, 240 tonnes of gas were used (more than 100 tonnes greater than used a month earlier at Ypres, Belgium).

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[2] For references to the main ones: https://umcs-pl.academia.edu/AnnaZalewska; https://www.researchgate.net/profile/Anna-Zalewska-6; see also Zalewska, A. I. and Kiarszys, G. 2021. The forgotten Eastern Front: Dealing with the social and archaeological legacies of the Battle of the Rawka and Bzura Rivers (1914–1915), central Poland. *Antiquity*, 1—19. doi: https://doi.org/10.15184/aqy.2021.134 and refs.

The final paper in the first section (pp. 117–33 by Szymon Domagała) discusses the landscape changes in the Rawka and Bzura regions that constitute both a commemoration and forgetting of the relics of the Great War. The paper discusses how the pre-existing landscape was first obliterated by the military activity, and presents the evidence for the fortifications, hinterland and communication lines of the front. The total length of fortifications within the research area is at least 688 km, and there were over 54,814 individual features (dugouts, and bunkers, shell craters, artillery posts, and the ruins of abandoned buildings) documented. The text also discusses (pp. 127–132) the manner in which this landscape was altered to bring it back into use. Apart from the trenches, dugouts and bunkers, shell and mining craters, that were to later hinder the land being taken back into agriculture, there had been a considerable amount of losses to the forest (for construction and firewood). The text briefly covers the question of the rebuilding of ruined structures, backfilling the holes left by War to return land to use for agriculture, and where this was too difficult due to the surface relief, reforesting these areas, leading to their continued preservation.

The volume's second part presents the use of landscape archaeology in the process of returning the memory of the battlefield here. Dorota Cyngot discuss the natural environment and then (pp. 143–154) archaeological fieldwork in this area previous to the APP project. Although pre-existing archaeological records (across an area of 1255 km^2) document 5107 findspots, only 293 are post-medieval, of which 27 relate to the modern period. Shockingly, despite the whole area being covered in relics of the fighting, before the APP project, there was an official record of only three related to WW1 – two of these (reported in the third volume) were found in fieldwork preceding the construction of the A2 motorway that were among the handful of sites of this period excavated in the whole country.

The core of this section are a series of papers on the use of teledetection and other non-invasive techniques of survey in the identification and analysis of relics of World War I in the research area. These tend to concentrate on the methods and limitations and comparability of different versions of these techniques in specific landscape conditions seen across this landscape of conflict and serve as an introduction to the results that are presented in the second volume. Grzegorz Kiarszys (pp. 155–170) discusses the application of airborne laser scanning and Digital Terrain Modelling (further DTM) in the project and presents examples mainly from the southern region in the forest at Joachimów-Mogiły as well as on individual sites with earthworks (such as military cemeteries). He also writes with Włodzimierz Rączkowski (pp. 171–180) on the use of contemporary aerial photography in the project. Although several flights were undertaken over an area about 18 x 19 km, only relatively poor traces were found over most of the area. Piotr Wroniecki (pp. 197–212) examines the use of geophysical surveys as a non-invasive technique for revealing details of sites selected as a result of teledetection (and presents examples from a cemetery in

wooded terrain, part of a trench system and the region of an army camp behind the defences).

Jacek Czarnecki (pp. 181–196) in a paper that combines the themes of teledetection and archival research, provides an in-depth discussion of a group of surviving 106 archival oblique reconnaissance photos now in the Bundesarchiv Freiburg that provided a massive amount of helpful information. The author identifies the Feldflieger Abteilung that took the photos, the army unit they were taken for and their dates (between 7th May and 23rd June 1915). He tentatively links the earliest of them with reconnaissance before the gas attacks that the Germans were hoping would open the way to Warsaw.

The third part of the first volume discusses life in the trenches on the Rawka and Bzura in 1914–1915 and its material traces. It starts off by looking at the uniforms and typical equipment of a soldier in the army of the Russian Empire (Jarosław Rostkowski, pp. 215–238). A parallel paper (Stanisław Kaliński, pp. 239–260) examines the uniforms and typical equipment of a German infantry soldier. Both articles discuss how uniforms of the WW1 period relate to what had gone before, and how they underwent change in the course of the conflict and compares the excavated fragments with documented material. The different approaches of both chapters are interesting, reflecting the sources of the authors' expertise; the first is a military re-enactor and presents each item of equipment individually, while the latter mainly concentrates on whole uniforms on the basis of preserved photos, documents and literature.

The third paper in this section by Krzysztof Karasiewicz and Jakub Wrzosek (pp. 261–275) takes a look at the rifle ammunition of both Russian and German armies found in the investigations. Nearly 12,000 finds of this type were collected and analysed in a number of ways. The authors stress that even such non-descript material, commonly-found (and collected by artefact hunters), contains archaeological information. From the factory marks and dates stamped on them, interesting conclusions are drawn about the manner of supply of both armies on this front, also the different types and groups of this material could be related to events on the front, such as the concentration of large numbers recovered on the site of Russian trenches overrun by the Germans on January 31st 1915. Unused ammunition found associated with human remains lying unburied in no-man's land could be used to determine to which army the soldier had belonged. Damian Bednarczyk (pp. 277–286) analyses the 33 Russian and German bayonets recovered during the investigations. Similar conclusions could be drawn from them, even broken fragments. There were examples of ersatz weapons, created to fill a shortfall in supply, another feature of interest is how some of them were modified by their users to suit their personal needs and make them more multi-functional as a tool. Grzegorz Śnieżko (pp. 287–298) deals with a much more personal aspect of life in the trenches as revealed by the devotional articles recovered by the investigations. Of these crosses, crucifixes, medallions and plaquettes, 16 could

be related to the Eastern Church, and four the western one. Two of the latter came from the Russian lines, which the authors linked to Poles serving in both armies.

The final paper considers the information content of the correspondence of men serving on this section of front ("'We're going to the trenches tonight', German field post [Feldpost] in the Battle of Rawka and Bzura", S. Kaliński, pp. 299–314). It presents examples mostly from the author's own collection. Although there is little here that adds to what we know about the flow of events from other historical sources, these messages reflect the mindset of the soldiers and their day-to-day concerns (interestingly, military censors seem not to have been interested in editing these accounts).

A number of sites (APP 1–27) were distinguished within the research area and a major part of the 2014–2018 project involved the excavation of some of them. Five of them (in Joachimów-Mogiły, Wola Szydłowiecka, Borzymówka and Kozłów Biskupi) were on remains of the battlefield and field fortifications of the first line. Three (Nieborów Forest and Jasionna) were elements of the hinterland of the battlefield. A separate category of sites were the forgotten resting places of fallen soldiers (three areas of the Joachimów-Mogiły cemetery, including two mass graves, Kozłów Biskupi, a forgotten forest cemetery, now damaged by ploughing and two previously-exhumed war cemeteries at Wola Szydłowiecka). In this volume, however, there is no detailed presentation of the methodology, stratigraphy, contexts and features of these invasive interventions, though several plans are used for illustrative purposes (Fig. 20 on p. 94, Fig. 1 on p. 326). The objects recovered from them are described in some detail (a reflection of the "return to things"?). The lack of a section on these excavations giving these objects the status of an archaeological source (that is a context, beyond the typology and relation to written and iconographic sources which they merely illustrate) is however a puzzling feature of a volume reporting the results of a project involving the application of archaeological methodology to the study of the remains of the First World War.

The first volume's fourth section discussing the material remains of death on the battlefield (pp. 315–408) is one of the most poignant in the collection. Three of them (pp. 343–354) discuss the anthropological examination of the unburied remains of the fallen that were left on the battlefield to be recovered a century later by the excavations. Despite the fragmentation and corrosion of the bones in the soil, data on health, illnesses and trauma were gathered. It was noted that a number of the bones from no-man's land were burnt, reflecting the attempts of soldiers in the trenches to use flame throwers to rid themselves of the stench of the decomposing corpses lying there irretrievable in the firing line. A small scale isotopic and genetic characterisation of a sample of this material indicated a possibility to identify where in the huge German and Russian empires the men fighting in the trenches had come from (there is a second osteological report on the remains of fallen soldiers discovered in the excavations in other areas of the complex in the third volume). Attention is paid to the ethical

issues involved in studying human remains and the finds lying with them. Remains from formal burial sites were only examined in situ, an underlying assumption of the research was not to disturb human remains as far as possible. At the end of the first volume (pp. 409–420) there is a discussion of the reburial of the human remains that were collected for study during the project in a new "burial mound" erected within the existing war cemetery of Joachimów-Mogiły.

The other four papers in this section discuss the issue of the military cemeteries. Although these should be the most permanent element of the post-battle landscape, as detailed by A. I. Zalewska and D. Cyngot (pp. 317–324) a major problem is their disappearance. Already by the end of the 1960s, many of them had vanished both from memory and view (p. 319). Although, theoretically, protected by law on at least two counts, they were comparatively neglected by the conservation authorities (only 6 were on lists of conservation zones even in 2014). In the 1990s, a few local private individuals began to interest themselves in these sites and start to find and compile information on them, and sometimes undertake work to tidy some of them.

During the fighting, many of the fallen in and around the research area had originally been buried where they died, but as the front moved east and the area came under German occupation, a number of military cemeteries was established to which bodies lying in scattered graves on the battlefields were removed. They were usually fenced or walled off, with permanent grave markers, and sometimes a more substantial focal monument. After the area came under Polish administration, archival material, both local and in Germany indicates that already in the 1920s (pp. 320–321) for a number of reasons locals could have a rather hostile attitude towards these cemeteries and the human remains found in their fields outside them. Małgorzata Karczewska (pp. 355–386) looks at the documentary evidence for these military cemeteries on the basis of examination of the correspondence 1923–1939 in the German Ministry of Foreign Affairs and the *Volksbund Deutsche Kriegsgräberfürsorge* concerning Germans who took an interest in the graves of the fallen that were on Polish soil and the families often wanted to be able to visit the graves of their loved ones. It seems that throughout the whole of the period before 1939, there were very poor relations between the government of the new Polish state and the German authorities over the matter of access to and treatment of First World War graves.

What is notable is that in this same period (or subsequently), it seems that there is little evidence that the Bolshevik government of Soviet Russia was at all interested in the fate of these cemeteries, even though (or perhaps because) they contained the bodies of the Russian Imperial army (p. 357). The authors of this volume did not locate any documentation relating to this topic.

By 1924, the German authorities were already concerned about the state of the many scattered cemeteries in rural districts. Many of them lacked proper fences or gates, some had lost their grave markers, they were overgrown by weeds, there were

several cases of profanation of cemeteries (pp. 357–358). Starting from 1925, a number of the cemeteries were closed and the remains moved so that the land that military authorities had appropriated during the War returned to previous owners. Exhumation was often done badly and hurriedly (or nominally) with very little documentation, and without keeping the German authorities informed. This often meant that the new place of rest of the remains of individual soldiers could not be traced (p. 358).

As a result of a series of complaints from German families visiting the graves about the state of many of the War cemeteries in Poland, the growing diplomatic problem was dealt with by closing some cemeteries, exhuming the remains and moving them in close cooperation with (and partly funded by) the German authorities to a fewer number of larger cemeteries that would be easier to look after. This began in 1934 and a number of the new cemeteries were designed and laid out in modernistic style designed by German architects (pp. 361–370). The bodies of the German fallen were transferred there, while the remains of the "non-German dead" remained in the original resting place (p. 369). Again, this work was poorly-documented[3] and the only way that in individual cases anything will be known about what was done on the original sites and what they still can contain will come from archaeological investigations.

Two subsequent papers (both by A. I. Zalewska and G. Kiarszys, pp. 387–402 and 403–408) discuss the process of localisation of the documented and undocumented sites. The state of preservation of this resource is such that the details can only be recovered by combining the results of several techniques (pp. 388–390), archival research, cartographic sources, analysis of archival and contemporary aerial photos and teledetection, such as DTM. The result is an attempt to present a complete list and map of the known sites, though it is clear that further research may well produce evidence for more. The APP project established that there had been 103 such sites in the study region, but a number of them have now completely disappeared (33% of the known ones), and also another 41% that had been exhumed in the 1920s and the remains moved to another cemetery to allow the land to be used in another way (most frequently returned to agriculture). Those that were in the forest most frequently tended to be forgotten, and although some have the surface relief preserved, others are damaged by deep ploughing for forestry. Still others are being damaged by grave robbing by artefact hunters with metal detectors looking for collectables (pp. 398, 404).

The second volume reviewed here is a joint work by three authors (Anna I. Zalewska, Jacek Czarnecki and Grzegorz Kiarszys) and its focus is the battle landscape created by the front on the Rawka and Bzura in 1914–1915 in the light of archaeological remote sensing and historical sources. It seems that the intention was that it should function

[3] Likewise, there is a lack of information in this volume on what was done on these sites during the 1939–1945 Nazi occupation of Poland.

as a stand-alone resource and thus to some extent, some of the material presented here overlaps with the first volume.

This project treats the studied battle landscape as a combination of natural and anthropogenic elements, linked to the hydrography and existing communications network of the region. Despite being static in one sense, the battle landscape was not a stable situation but (pp. 15–17) underwent a number of changes in the period of functioning, the archaeological evidence of the line of the front proved it to have been far more dynamic in its development than the documentary evidence had suggested (p. 155). An important conclusion is that it turns out that the preserved contemporary military maps that historians have used to analyse the processes happening here were all inaccurate, the traces of the fortifications on the ground were often completely different from the lines drawn by observers and strategists during the fighting.

The second and third parts introduce the methods of remote sensing used in researching this landscape (pp. 29–49), and especially (pp. 53–61) the use of the surviving aerial cover from May and June 1915 that proved to be very important in realising the aims of the project. There is a richly-illustrated presentation (pp. 35–49) of a typology of the anthropogenic features observable in the contemporary aerial photos and also DTM conducted for the project. This is followed by a discussion of the spatial organization of the front line, the nature of field defences in both open as well as forested areas (particularly a feature of the southern part of the study area) and the protection of communication lines between different elements of the system. The various types of earthworks involved in the fortification line are discussed in relation to their function; particular attention in paid to infantry firing stations and their physical traces. This is followed by a presentation of a somewhat neglected category, the military campsites both on the front line and behind it. These turn out to be quite complex and substantial sites in their own right, and a number of them are still astonishingly well-preserved.

The fourth part of the volume (pp. 65–125) is the most important and outlines what is known about the archaeology of the five nodal sections of the front (see above), and goes through the historical evidence for each of them and then presents what is known from remote sensing about the relict landscapes of the fortifications and the types of remains met there. They are best preserved in the first of them (Joachimów-Mogiły, pp. 65–79). Here a lot of the earthworks were not levelled after the War and remain covered in forest. While there is evidence for heavy fighting in the vicinity of Wola Szydłowska (Area II, pp. 79–91), this area was not covered by the surviving contemporary German aerial photographs and more recent agriculture and forestry work has totally obliterated surface traces of the fortifications, therefore – despite the importance of the area in the history of this front – there is still a gap in all the maps at this point (pp. 79–81). There is considerable information from Humin (Area III, pp. 82–93) from the 1915 aerial photos, but due to levelling of the terrain by agriculture

less from DTM; the same applies to Borzymówka (IV, pp. 93–113) and the fifth region (Zakrzew, pp. 113–125).

The book's final section sums up what has been learnt about the landscape of the region, both the military earthworks and their infrastructure, but also the many cemeteries and how the material traces reflect various aspects of the short and long-term effects of the War on the participants of the events (both soldiers and the local inhabitants).

The third volume reviewed here has a different publisher from the other two (and in formal terms a different name: "Archeologia Frontu Wschodniego Wielkiej Wojny..." [Archaeology of the Eastern Front of the Great War] (further AFW) and attempts to connect the results of the APP project to wider issues. The 18 chapters by separate authors are arranged in three broad sections that deal with the heritage of the Great War respectively as a cognitive issue, a social issue and a conservation issue.

The first part contains some reports on the excavations undertaken within the project and the (over 20,000) finds from them. The opportunity is taken to publish the results of rescue excavations preceding the construction of the A2 motorway. Piotr Świątkiewicz reports work done in 2005–2007 at Bolimów site 7, while Dorota Cyngot and Dariusz Wyczółkowski summarise that of 2008 on Miedniewice site 3. This is followed by summaries by A. Zalewska of excavations undertaken on a small mass grave of soldiers (APP 14) at Joachimów-Mogiły and an exhumed cemetery (AP 24) at Wola Szydłowiecka. In the next chapter she summarises in a similar way results of invasive investigations of parts of the German infrastructure behind the lines (sites APP 7 and 8, APP 25 in Nieborów).

Sites like these produce enormous quantities of fragments of artefacts of many types, and any report on such investigations can only aim to present this information synthetically. The section begins with a discussion of the systematisation of the finds left behind on the investigated sites by the activities in 1914–1915, they are primarily treated with reference to the function they performed in the primary process (that is life in the trenches on the Eastern Front). The excavated material is divided into eight categories: I – fragments of rifles or their ammunition and cold weapons such as bayonets etc.; II – fragments of artillery weapons or their ammunition and grenades; III – fragments of military uniforms and equipment; IV – personal items of the soldiers; V – elements of field fortifications (e.g., barbed wire) and tools; VI – elements related to infrastructure and daily life; VII – other finds related to the depositional process in 1914–1915; VIII – finds from outside the chronological horizon of WW1 encountered during investigations (see also vol. I, pp. 21–23).

Two papers consider the human aspect of life in the trenches of the Great War and in particular how the two armies were supplied with provisions and raw materials. Dorota Cyngot amalgamates data from the documentary sources and material remains to examine different items and raw materials obtained by various means from local

inhabitants by soldiers of both sides. Angelika Bachanek discusses the archaeological finds related to feeding the soldiers. Associated with these topics are reports on finds of glass (Kamil Baturo), pottery (Magdalena Bis), and animal remains (Joanna Piątkowska-Małecka), as well as personal items and uniform elements of leather (Jarosław Rostkowski).

Of course a large amount of the excavated material relates to the fighting; the rifle ammunition and bayonets were discussed in volume I, here Krzysztof Karasiewicz reports on remains of artillery ammunition, hand grenades and rifle grenades (finds category II) as both a cognitive and conservation challenge. Jacek Czarnecki writes about the neglected subject of elements of material remains of field fortifications such as barbed wire and caltrops (finds category V). Quite apart from the horrific effects of these items on men encountering them in battle, he raises the issue of taking the former existence of wire barriers into account when detailing areas of battlefields for preservation.

The volume's second section considers the social (public archaeology) aspect of the preservation and use of the material remains of the First World War, both the cemeteries as well as the landscape features related to conflict (in particular the use of chemical weapons here). It focuses on the specific nature, values and social potential of this painful heritage. The various means in which closer familiarity with and interest in this dark heritage can be used obviously includes as destinations for cultural tourism and as a warning. Anna I. Zalewska and Jacek Czarnecki discuss the creation of a historical trail, how it could function with GPS locations to highlight material traces of the Eastern Front of the Great War in the landscape of the study region, as well as the resting places of fallen soldiers. They postulate that this should concentrate not only on cultivating the memory of those who fought and fell on this part of the front in 1914–1915, but also of the losses of life, property and livelihood of the local population displaced by this broad zone of intense and long-term military activity, a factor that tends to be forgotten by military historians.

The final section of the third volume concentrates on the conservation challenges ahead in preserving the previously somewhat neglected material remains of the First World War. Work must continue on the recognition and documentation of the surviving remains by documentary work, fieldwork and continued remote sensing. While the demarcation, preservation and maintenance of the many military cemeteries is one problem, a crucial issue is the preservation (both preventive and active), display and commemoration of the various traces in the landscape of field fortifications and associated features. This is an especially difficult problem as many of them have already been erased, except where preserved in forest or other areas of vacant land, some of the areas of which it is argued should be preserved as reserves (for example in areas protected as part of the Bolimów Landscape Park). Another burning issue is how to prevent the illegal destruction of the archaeological record of these sites by souvenir

hunters with metal detectors ripping into archaeological contexts and patterned assemblages, often just below the surface, and selectively stealing collectable items.

One of the last chapters of the volume discusses a case that is symptomatic of the problems of preservation. The chapter details the protest of the excavators of a recent planning decision. Despite this project having taken place and the recent publication of the results, planners of a major development (a new airport) just to the east of the research area (arbitrarily?) drew the line of an access road to it right through not only a complex area of the front line but also across or very close to the site of several known military cemeteries. The protest seems (at the time of writing) to have achieved the re-routing of this planned new road through an archaeologically less sensitive area.

In the Polish context, this project and its reports are innovative on at least three counts. Although all sites of this period are automatically protected by Polish law as archaeological sites, this project is (inexplicably) one of the first in the country to examine and publish the archaeological remains of the First World War material on such a scale. A second feature of note is that this volume is the fruit of a fully-fledged holistic landscape archaeology project. Landscape archaeology (as opposed to settlement archaeology) is a comparatively recent discipline in Poland. Thirdly, the underlying ethos of this project that of public archaeology with the aim of using this "dark heritage" in a conscious outreach effort to raise consciousness and awareness, and encouraging public enlightenment and encouraging seeing and thinking about, and acting in, the world in different ways.

In terms of the public and relationships with the material remains of the past, the volume highlights three major groups. The first consists of people who are oblivious to (or even hostile towards) the values of the historical landscape and the relics it contains (the farmers that wanted to reclaim land, developers, people uninterested in the historical environment – as well as those who never had the opportunity to learn about and appreciate it), the second are history enthusiasts and involved activists that that want to preserve it for general benefit, the third are artefact hunters who want to exploit productive sites to obtain collectable relics for their own benefit.

That these relationships are never clear cut and simple is illustrated by one interesting feature of these volumes, which is the key role played by a collaboration between the archaeologists and local amateur enthusiasts, responsible collectors and re-enactors. But what is also made clear is that if irresponsible and illegal artefact hunting of these sites is not curbed in the immediate future, severe destruction of the archaeological record will result. Much has gone already. This especially affects that part of it that is sheltered in the forest where clandestine seekers are at less risk of being discovered *in flagrante*, but where the remains are preserved just under the fallen leaves.

Throughout the volumes, and one of their strong points, a major theme is the very human aspect of this conflict, as brought out many times through contact with the physical objects, that spanned the temporal void and bring us into contact with

a living past. On the western front much of the fighting was between forces of nation states, here the soldiers conscripted to the imperial armies facing each other were of multiple ethnicities, Poles were fighting in both armies on soil that in formal terms would only become Polish (again) several years later. This is an aspect the authors touch upon several times.

All three volumes are in Polish, but have summaries and conclusions as parallel texts in Polish and English. In the first two volumes, these however are regrettably brief, and although the illustrations and tables are key carriers of information with a few exceptions, their captions are only in Polish. This undoubtedly will hinder their use by foreign researchers. More to the point, bearing in mind the nature of the two warring parties that left behind these remains, it is especially disappointing that there are no summaries in German or Russian.

In the case of volume two, in order to examine some of the figures in more detail, the book should open flat – an activity the fragile binding does not allow. As recompense, the figures on different loose pages can be compared more easily. Even so, it is sometimes difficult to relate the various fragments of the discussed landscape with each other. Also, even though a lot of the information is presented on full-page colour illustrations, they are sometimes drawn in such a way and such as scale as to be barely legible, many contain too many types of information, some of the lettering on the maps is less than 2 mm tall and disappears into the raster of the printing method (e.g., on pages I: 19 and II: 414). In a number of cases, not all of the features marked on the maps are identified in the accompanying key. In order that the information gathered by this project is preserved, it is to be hoped that in future funding may be found to create something in the nature of a site atlas where the whole documented landscape can be seen and studied spread out, or possibly also in some searchable and zoomable digital form.

Those quibbles aside, these volumes are an important contribution to the growing number of archaeological studies of the First World War, for the first time synthesizing research undertaken in Poland. They add an impressive amount of new information about almost-forgotten aspects of this conflict. Through their multidisciplinary and multifaceted approach, the APP/AFW projects not only demonstrate how archaeology makes an unique contribution to our understanding of the human past, but also highlight issues of memory, heritage and commemoration in their public, social and cognitive aspects. The resultant publications mark a significant step towards collaboration among researchers and practitioners from various fields and lay firm foundations for the further development of an archaeology of twentieth century conflict in central Europe.

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Gerda von Bülow, Sofija Petković (eds), *Gamzigrad-Studien I. Ergebnisse der deutsch-serbischen Forschungen im Umfeld des Palastes Romuliana*. Römisch-Germanischen Forschungen, Band 75, Wiesbaden 2020, Reihert Verlag, 414 pp., 123 illustrations b/w, 190 illustrations colour, 16 Tables and 15 Plates.

Reviewed by Alfred Twardecki[a]

As the title suggests, this work is only first volume of the final publication of German-Serbian excavations at Gamzigrad in the Zaječar District in eastern Serbia. It is very important archaeological site, one of Serbia's UNESCO World Heritage Sites.[1] The ruins itself were well known and have been excavated since 1953 by Serbian archaeologists as well as being mentioned in several publications previously (Herder 1846 [first mention]: 20–21; Kanitz 1861: 8–9; Breithaupt 1861 and few mentions in Serbian literature, Serbian excavations: Vasič 2007 and Živić 2011). However, it was not until the 1980s that an inscription was found during excavations that allowed for final identification (Srejović 1985).

The archaeological site is located south of the Danube River, near the present city of Zaječar. Its unique position on the map of archaeological sites in Europe is a consequence of being the location of the complex including palace and temples called *Felix Romuliana* built by the emperor Galerius (Caesar during first tetrarchy, 293–305 AD, and Augustus in the second – 305–311 AD) in the ancient province of *Dacia Ripensis*. The whole area of this complex covers about 40,000 m^2 and was thus clearly a site of some importance especially in the late Roman period.

In this first volume, one may find all is needed to know about activities of the Serbo-German expedition conducted between 2004 and 2012 at the site, such as geophysical survey, topographical analysis, prehistory of the landscape of the area, analysis of the pottery, coins, sculpture, mosaics as well as preliminary results of the archaeological survey of several components of the whole palace complex.

In the "Vorwort", the Editors explain the strategic aim of the project, which they state (on page 1) to be:

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[1] https://whc.unesco.org/en/decisions/1347 (accessed: 09.05.2021)

1. A landscape archaeological exploration and investigation of the wider environment, the interactions between environmental conditions and settlement activities from prehistory to the Middle Ages should be shown.
2. Settlement historical prospecting with geophysical methods and excavations outside the walls of the palace should answer the question to what extent the palace was a uniquely constructed facility or whether it was embedded in a grown cultural landscape.
3. The planned digital construction survey of the already uncovered palace interior should serve to prepare conservation and restoration measures.

The results of the geoarchaeological and settlement history research as well as the detailed archaeological research are the subject of the articles in this volume.

As one may see, the first volume mainly concerns geophysical and geohistorical survey with the addition of description of selected object categories. That seems a reasonable plan, however, we await further volumes with presentations of other categories of finds.

Unfortunately, not all the initial assumptions of the publication have been implemented. The tragic death of prof. Dr. Ulrike Wulf-Rheidt, who was responsible for the analysis of building structures, made it impossible to include this part of the research in the publication. She was especially responsible for the architectural analysis of the exposed interior of the palace and developed the first ideas for protective structures for the mausoleums and the tetrapylonon Magura height.

The first chapter is "Bauforschung und Arbeiten des Architekturreferats in *Felix Romuliana*- Gamzigrad von 2004–2012" (by Christoph Rummel, pp. 5–8). The chapter is very short and generally describes only the history of architectural research made under the lead of prof. Wulf-Rheidt in the years 2004–2012. Despite the fact that we already know several papers published by prof. Wulf-Rheidt (Wulf-Rheidt 2007; 2011; Bülow and Wulf-Rheidt 2008; 2009; Skundrić and Wulf-Rheidt 2016) it would be very interesting to find a synthetic view and interpretation of the architectural constructions in the following volumes. The point is that *Felix Romuliana* is one of most interesting palatial constructions from the time of the Tetrarchy as well as late Roman official buildings in general. As Rummel enumerates, in the research were documented many remains of funeral constructions, a tetrapylon, mausoleums, temple, arch constructions and most importantly the palace itself, with the intention of performing their reconstruction. This type of documentation was made over the years 2004–2007. In following years important part of the activity was re-examination of the decoration of the known buildings.

As the author mentions, the aim of prof. Wulf-Rheidts was in the second phase to attain a better understanding not only construction itself but also gain a holistic view of the place of the construction using a "Geographical Information System" (*Gamzigrad*: 6). The final result should be a 3D model of the palace and its neighbourhood

and that was the aim of new project connected with TOPOI Exzellenzcluster. The final results of this work will be published later.

The second chapter is "Das deutsch-serbische Gemeinschaftsprojekt zur geophysikalischen und archäologischen Erkundung der Umgebung des Palastes *Felix Romuliana.* Chronik der Geländearbeiten von 2004 bis 2012" (by Gerda von Bülow, pp. 9–16). At the beginning, the author presents a brief overview of the previous history of the Serbo-German expedition. Von Bülow was head of the archaeological part of the project. Archaeologists and geophysicists focused, contrary to the architects, on the area around the palace. The first step was geomagnetic research of the area. In 2004, Mark Opelt used a "1-Kanal-Fluxgate-Gradiometer FM 36" together with a Totalstation with GPS. In the following years, devices of the same or higher class were used (Georadar, 8-channel gradiometer measuring trolley, 5-channel gradiometer configured as a measuring carriage with odometer). This allowed relatively quickly to identify areas of interest for further investigation, such as "a row of rooms with a portico in front that leads through a clearly recognizable enclosing wall to an already known *horreum* west of the palace". The results of these studies were verified with the help of small sondages. In addition to the architectural remains, a grave was also examined, which turned out to be untouched. Many bronze coins from the late 3rd century and late fourth centuries have been found, some of them were minted between year 364 and 378 (Petković 2007: 266–267).

As a result of research carried out in 2007, especially in the area of circular structures to the north of the palace, it was hypothesized that the structure was damaged as a result of a natural disaster. As a consequence, in 2008, geographers from the Free University of Berlin were included in the research work. They conducted geomorphological studies, landscape analyses and test boreholes. By using a GPS device, the integration of the local surveying network into the world coordinate system was completed in year 2009.

The identified and partially archaeologically unearthed structures both inside and outside the palace are shown on the plan published on page 14 (*Gamzigrad*: fig. 1), in which they are superimposed on the existing, earlier plan of the palace. Most of the work was carried out outside the palace complex. Summing up: in the years 2004–2012, research was carried out in an area of about 5 km^2 (mainly outside the palace itself) and about 50 new architectural structures of various types were located. Most of them were concentrated in an area of about 250 x 300 m. As a result of the research, it can be concluded that the palace complex with the surrounding inhabited area covered almost twice as much territory than previously assumed.

A number of surveys were carried out in selected places, which provided a lot of new information on these structures. Most of them were destroyed before Emperor Galerius started building his palace.

The next sections of the volume have a rather technical character with many illustrations. Nevertheless, it provides important information and analyses of the topography

of the territory surrounding the palace itself. The first of them is a "GIS based topographical analysis in the surrounding of *Felix Romuliana*, Serbia"(by Janos Toth and Brigitta Schuett, pp. 17–26). The nature of this area (there are only two villages in the vicinity) has created the rare opportunity to conduct comprehensive topographic surveys over a large area. As a result of topographic research and geomorphological analysis, it was possible to partially reconstruct the process of dislocation of the soil in the area and therefore reconstruct its topography at the period when the palace functioned (pp. 19–20, fig. 7). The research covered an area of 193.75 km^2 (p. 20, fig. 4), which allowed inclusion in the analysis of the surrounding Roman fortifications at Kostol-Zajćev and Savinac, forming a chain of fortifications around *Felix Romuliana*. In the conclusion of the chapter, the authors point out that the location of the palace is "unique in its surrounding area". And at the very end explains that "The outstanding character of the site is based on the complexity of favourable features such as the type of bedrock, relief and topography".

The next chapter, "*Felix Romuliana*-Gamzigrad. Geophyzikalische Erkundung des Innenbereichs zu archäologischen Zwecken" (by Tim Schüler and Mark Opelt, pp. 27–42) provides information about geophysical research of the palace area itself. The tests were carried out using high-quality equipment (SYSCAL Pro SWITCH 48) using mainly ERT and magnetic survey techniques. This chapter contains detailed, richly illustrated information on the results of the research, which reached up to 14 m below the surface of the terrain. Together with the control survey, they also made it possible to trace the location of geological layers and locate anomalies as well as provided comparative material for research conducted outside the palace.

The part "Landscape History research in the Surroundings of the Archaeological Site *Felix Romuliana*" (by Jana Škundrić-Rummel, pp. 43–58,) is devoted to the study of the hinterland of the castle itself. The work was mainly based on archaeological research supported by geomorphological research. The author points out that "our data show that the history of the site and its surroundings is significantly more diverse than previously thought and directly reflect the way in which the economic and social landscape was transformed in both spatial and chronological terms" (p. 43). The main transformation in question seems to be a significant depopulation of the hinterland in the period of Tetrarchy in contrast to the actual site of the palace complex itself. In the final part of the chapter are interesting comments about the connections between centre and periphery (palace and hinterland). However, the author pointed out that it was maybe too short a period "for the development of any hierarchies on a local level" (*Gamzigrad:* 55). The first settlements in the area appeared in the Neolithic period. In that context, the settlement activity in the area under the Roman Empire marks, as is described, a "clear hiatus". Also very interesting are the final remarks on a theoretical level about artificial and sudden (in the term of historical processes) building of the palace centre and its "area of influence" on the hinterland.

The chapter "Prehistory of North-eastern Serbia using examples from *Felix Romuliana* and its surroundings" (by Alexandar Kapuran, pp. 59–82) complements the previous chapter in a very good manner. The author deals with the human activity in the area since the Neolithic period, which gives a broader perspective for historical processes before the Late Roman Period and allows the comparison of changes in the settlement process in the long perspective. It shows the development of human settlements in that region connecting basins of the Morava and Nišava rivers with the Carpathian and Lower Danube regions. The chapter is illustrated with many plates with illustration of the mainly ceramic material finds in the area.

The section "Die Ergebnisse archäologischer Sonderausgrabungen auf geomagnetisch prospektierten Flächennördlich (ca 6 ha) und südlich des Palastes *Felix Romuliana*" (Gerda von Bülow with contribution of Miloje Vasič, pp. 83–116) shows the results of archaeological survey of the two areas north and south of the palace. To the north there was a line of geomagnetically identified and partly excavated two rows of rooms as well as a huge (106 m long and 22 m across) aisled construction, an oval (most likely columnar) construction 30 x 36 m diameter with an eight-sided structure in the middle. The text presents several hypothetical interpretations of the structures. There were also found signs of other, but heavily damaged, structures.

To the south were identified two architectural structures discovered during the geomagnetic survey. The results show that the constructions are very similar to the earlier unearthed remains north of the palace. However, the poor preservation of the remains suggests that maybe this space was subject to more intensive changes than in the "Northern Area". The detailed description of these results is illustrated with many instructive figures. The author points out in the chapter's summary that the unearthed remains could be primarily part of a much more extensive architectural complex however of more residential purpose than the more official and monumental structures in the "Northern Area". It is, however, still not clear when both the "southern" structures were built during existence of palace or before. Additionally, traces of earlier constructions were also found, which were dated to the late 3rd century, and which were destroyed most probably by a natural disaster.

The part "*Felix Romuliana.* Die Gefäßkeramik aus der Grabungen *extra muros* 2006–2008" (Sven Conrad, pp. 117–170) is the chapter that is the longest and richest in illustrations. It presents in very solid manner a general view of the research on the ceramic material from *Felix Romuliana* before the German-Serbian expedition started its activity, the stratigraphical situation in the German-Serbian trenches and the typological background of the ceramic fragments found during the excavations. The latter is the most essential part of the chapter. This is followed by a section that presents a statistical summary of the material and further systematization of the ceramic vessels identified during the excavations. Here can be found also a very solid and typical presentation of the ceramic material, which as almost always, is crucial

for site chronology. The chapter ends with a summary that presents brief information about the general chronology of the finds (second half of the 3rd century AD to the first quarter of the 4th century [basilica] and from the 4th to the 6th century AD with some medieval material from the 10th–14th centuries on other sites) and new forms of vessels found in *Felix Romuliana* as well as about the imported pottery. The assemblage is predominately composed of fragments of local pottery with very few imports. In the typology, so called "kitchen ware" predominates, with very few transport amphorae. However, the author points out that the presented material from the extramural areas may not be representative for the whole *Felix Romuliana* complex. After the text, there are several very useful tables with the material divided both chronologically and typologically. The last part of the chapter is a catalogue of the finds (136 items).

The chapter "The results of Archaeological Research in the South Tower of the West Gate of Later Fortification of 'Felix Romuliana' (Tower 19)" (Sofija Petković, pp. 171–204) is concentrated around the excavations at the Tower 19. After a detailed presentation of this work, the author concluded that the chronologically identified activity could be divided into two main phases – the first from the last quarter of the 4th century AD until the mid – last quarter of the 5th century, and the second dating from the end of the 5th century to the beginning of the 7th century AD with many architectural sub-phases during both phases. The author give us in the introductory part of the paper a presentation of a more general chronology of the site naming six archaeological horizons identified at the place: 1 prehistoric (early Neolithic to the Iron Age), 2. Roman settlement and fortification (2nd–3rd centuries AD), 3. Imperial palace (3/4th centuries), 4. Late Roman fortification and necropolis (end of the 4th – middle of the 5th century), early Byzantine fortification (end of the 5th – beginning of the 7th century) and 6. Medieval settlement and necropolis (end of the 9th – end of the 11th century). She also briefly describes the identified architectural activities in these periods and gives basic literature of the earlier, pre-German research. This part is very useful as it allows getting the "bigger picture" of the site in its chronological changes. The text is very well illustrated and as an Appendix has a catalogue of small finds from the Tower 19 (38 items).

The subsection "Coins from Tower 19 in *Felix Romuliana*" (Miloje Vasič, pp. 205–212) starts two chapters with publications of the two kinds of finds from the Tower 19 excavations crucial for dating: coins and pottery. It is very solid numismatological publication with proper tables and graphs. In general, the author presents 79 bronze coins dated from 239 (Viminacium) until 423 AD (and one coin of Justin I). However, the author concludes that the "real circulation had begun during the reign of Valentinian I, probably after 367 AD". He also correlates archaeological layers with the coin finds which is an important contribution to building a chronology of the site. Another chapter, "The Pottery from Tower 19" (Sven Conrad and Ana

Premk, pp. 213–244) with many illustrations and tables present results of research on the pottery finds. Here is a detailed description of types of the identified vessels with their dating. In general, "they cover a stratified chronological spectrum from the second half of the 4th to the 6th century. Most of the finds can be attributed to table vessels and kitchen ware". This chapter gives solid confirmation, based on the material evidence, of the conclusions presented in earlier chapters.

The section "Die Villa *extra muros* nördlich von *Felix Romuliana*. Ergebnisse der Grabungen 2010–2012" (Gerda von Bülow with contribution of Miloje Vlasić, pp. 245–286) presents results of excavations north of the palace. The text in which the course of archaeological works is discussed in detail is well illustrated with plans and photos. After that part, the authors present their own interpretation of the architectural remains. First of all, they are dealing here with a quadrangular structure with dimensions of 22.5 m (north-south) and 32.75 (east-west), in which seven separate rooms were identified. The main entrance led to the courtyard surrounded by a colonnade, from which it was possible to enter other rooms. This type of building was described in a 1970 publication (Vasič1 970: 56–59) as a "closed four-sided villa" with a strong influence of the local (Dalmatian) architectural tradition (interior corridor). This type of building was especially popular in Pannonia from the second half of the 3rd century (Thomas 1964: 363–365, fig. 177). The authors of the chapter accepted this identification adding that the "villa" was destroyed by an earthquake or similar natural disaster. The northern and western parts of the complex were then restored but more as a workshop place or other outbuilding, but several parts were also used as the site of burials. Dating from coins (43 coins found) starts with Gallienus (245–268 AD) and ends with Gratian (375 AD) as well as with Arcadius (395–408 AD) in graves and there is proposed the following sequence: the first phase (villa): end of 3rd / beginning of 4th century AD with destruction in the second quarter of the 4th century AD; second phase: rebuilding (four workshops and graves) latest in 3rd quarter of 4th century AD. The activity in this area ends at the beginning of the 5th century AD.

The chapter "Fifth century burial in front of the Northern Gate of *Felix Romuliana* – anthropological analysis" (by Dragana Vulović, Nataśa Milandović-Rudmilović and Stefan Pop-Lazić, pp. 287–304) describes (with many photos) an isolated grave explored in 2014 in the vicinity of Tower 8. Thanks to the coins found in the grave (of Marcianus, Theodosius II and Aelia Pulcheria) it is possible to date this burial quite precisely to the 460 sor a little later. Anthropological analysis allows us to conclude that deceased was a male dead at the age of 35. Several skeletal anomalies allowed the researchers to identify some of the diseases that plagued the deceased during his lifetime and to conclude that he was horseman and archer. In turn, the equipment of the grave and its location allows the conclusion that he was respected member of the local community but "buried with haste most probably due to the imminent danger from the enemy or urgent evacuation".

The section "Die Porphyrskulpturen aus dem Palas von Gamzigrad" (by Marianne Bergmann, pp. 305–352) is not only one of longest chapters but also one that will arouse the highest interest from reader. It is well illustrated. Porphyry stone was, from the times of Diocletian, reserved only for sculptures depicting emperors and the imperial family. In the introduction, the author presents the ideological background of the official, imperial art in this period of which most important basis was founded by Alföldi (1934: 3–9; 1935). The later literature of the subject is also presented through the latest works of Bergmann (2018). After this important introductory part, there then follows a catalogue of 19 identified fragments of sculptures. It is divided by iconologically defined types of sculptures. At first are presented fragments of "larger than life" sculptures of emperors (nos 1–3), the fragments of (most probably) Victoria statues, which could be part of the large figures of emperors (nos 4–8 and 10). The other fragments belonged to another five or six sculptures that were not exactly identified. The most interesting is relatively well-preserved head of an emperor with a crown. After the catalogue the author presents results of her research and interpretation. In this part she presents also photographic reconstructions of the head introducing presumed colours which is very instructive and her thoughts about possible colours of other fragments. All this with very accurate knowledge of the literature of this subject. In the next part of the paper, follows possible identifications of the head as well as its dating with developed arguments. These considerations are underpinned by a thorough analysis of the history of the development of the imperial portrait during the period of the Tetrarchy. Only after that follows a section devoted to a detailed consideration of whether the artefact presents a portrait of Galerius or Licinius with a final in-depth analysis of the crown, which plays a key role in the dating and identification of the portrait as well as additional historical context which finally gives the hypothesis that it is rather a portrait of Galerius and the sculpture could be dated to the years 308–311 AD. Then follows a very interesting section, where the author tries reconstructing original sculpture of Victoria based on fragments nos 11–16 also with the photographic documenting the final proposal of the reconstruction. In the next section, one may find also few words about the original Egyptian workshop of the sculptures and after that an analysis of the destruction of parts of the sculptures which, according to the author, not only had political but also religious reasons (involving the fight against pagan religion).

The chapter "Mosaics from Gamzigrad, with special overview of the *sectilia* pavement" (by Gordon Jeremić, pp. 353–371) is another exciting part of the volume dealing with Roman art. The mosaics presented in the chapter were found in the palace itself also during earlier Serbian excavations. As a result, the author provides a presentation summing up the mosaics from all over the site. The mosaics – geometric and figural – are of most interesting value not only for art historians but in a wider sense. They include pictorial designs featuring depictions of Dionysius, the *venatio* and

animals (including a leopard) as well as numerous fragments and larger parts with geometric patterns. From the numismatic finds, the author dates the mosaics to the years 309–311 AD. Further analysis, including comparison of mosaics in the palace of Galerius in Thessaloniki and in other places in the Mediterranean basin, that could allow a more precise determination of the "primary *officinae* that were making the mosaics" is reserved for another publication.

The chapter "Eine neu entdeckte marmorskuptur aus der Villa *extra muros* nördlich von *Felix Romuliana* – Teilstück einer mythologischen Jagdszene" (by Gerda von Bülow, pp. 372–394) deals with the fragments of a highly interesting sculpture found in the year 2010 by the German team in the north-western corner of the palace, in the multi-part building structure. The fragment represents a wild boar attacked by a hunting-dog and was part of a larger sculpture, the most likely form of which is reconstructed by the author on the basis of a careful analysis of analogies of both sculpture and paintings from the period. The entire scene depicted a rider hunting a wild boar with a javelin, however it is not possible to date this piece precisely but only widely between 2nd and 4th centuries AD. The general reconstruction proposal is also presented in drawing (fig. 26) together with an ideological interpretation of the sculpture however without decisive conclusion.

The final chapter "Zusammenschau" (by Gerda von Bülow, pp. 395–405), also translated into Serbian and English language versions, sums up the history and main results of the project, concentrating on the geophysical and archaeological activity in years 2004–2012. It is true that apart from archaeological research, it was the geophysical research and geophysical survey based on preliminary results that produced the most valuable data and substantially enriched our knowledge not only about palace itself, which had been investigated earlier, but most of all about the remaining parts of the entire complex, as well as about the more distant surroundings, including the topographic changes that have occurred since the Neolithic period.

It remains to be hoped that the next volumes will be equally interesting and will also include a synthetic summary of all previous research.

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