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SOME REMARKS ON GLASS SEALS FROM THE TERRITORY OF POLAND FROM THE 17TH-19TH CENTURIES

Abstract: This paper presents information about modern glass seals obtained during archaeological excavations carried out on the territory of modern-day Poland after 1987. The author reviews finds and their characteristics and based on such collected data attempts to indicate their quantitative diversity, territorial range, and chronology. The paper also focuses on markings identified on glass seals divided by their types. These are individualised signs, monograms, symbols, descriptive signs, and numerical signs, mostly trademarks. This analysis aims to outline the state of research and indicate various research questions associated with the production and use of stamped glass vessels in Poland, which require further studies.

Keywords: glass seals, glass bottles, bottles with seals, glass finds, Poland, 17th-19th century

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Introduction

Glass bottles with stamps (seals) made of the same material¹ and glass seals attached to parts of bodies of glass vessels, are one of the most interesting archaeological artefacts. They stand out among the mass finds classified as glass cullet obtained during excavations on sites dated to the modern period, particularly in the large volume of a rather uniform bottle glass, since they are artefacts recorded usually in small numbers. The seals themselves, although small and often of a rather modest appearance, are characterised by considerable stylistic diversity, and in light of Polish publications released to date, similar specimens are usually registered on a rather

limited territory. Furthermore, inscriptions and pictograms placed on the seals may have different meanings or are difficult to explain and remain a mystery. However, the artistic qualities of the seals are of secondary importance, being subordinated to their primary function – utilitarian, as stamps were predominantly carriers of information about production and commerce, regarding workshops, manufacturers, and purchasers of these products, potential outlets, the capacity of the vessels and the amount of liquid stored in them. Markings on bottles also conformed to officially imposed requirements or advertised the goods labelled with them (both the vessel and its contents). Such products were used for storing, transporting, and serving mostly alcoholic beverages, mainly wine, beer, vodka, gin, and spirits, as well as mineral water.

The use of such markings on modern glass vessels from the territory of Poland may be seen as the consequence of the relationships and economic and cultural influences between various countries on the European continent at that time. This was the result of reproducing practices already tested and widespread abroad, which were also applied to local glass manufacturing and gained a good reputation among the local consumers.

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¹ In Polish archaeological literature, both terms are commonly used. In this paper, I also use them interchangeably. However, both expressions are ambiguous and imprecise in relation to the analysed artefacts (this problem was already signalled by Andrzej Gołębiewski – Gołębiewski 1997, 184, footnote 1). In terms of the semantics (as an ownership and identification marking) and the manufacturing technique, it would be more appropriate to use the term seal.

This was also the consequence of general tendencies towards the standardisation of glass packaging and the implementation of the imposed fiscal restrictions.

The custom of labelling glass containers in the form of stamps impressed in glass has western origins dating to around the mid-17th century. It subsequently became widespread and was used across the continent as well as in North America. It was most commonly used in the 18th century and in the first half of the 19th century.²

Such finds also spark interest among Polish archaeologists, leading to papers and monographs dedicated to the problem of stamped glass bottles and glass vessels. Based on the review of the Polish literature published since 1987, we can see a gradual increase in the number of such studies, particularly during the last few years.³ Despite the fact that the discussion on this type of artefacts was already included in many publications, this research problem is still far from being investigated thoroughly.

In this paper, I tried to collate the most important information about the above-mentioned finds published since that time, in order to bring them closer to readers and characterise them, as well as summarise the associated research problems and the current state of research at a national level. This discussion is of a preliminary nature. Its objective is to present the multitude and diversity of issues related to this type of artefacts, including outlining potential directions of further studies on the production, use, and distribution of glass vessels with seals in the territory of modern Poland.

A review of Polish finds of glass seals and main research findings

In Polish archaeological literature, such artefacts were recorded among other finds already as early as in the 1970s,⁴ although it was Leszek Kajzer who first paid more attention to them in his paper on the import of beer from the British Isles and glass containers used for that purpose, including bottles of English provenance.⁵ The breakthrough came with a paper written by Andrzej Gołębiowski, which was published several

years later.⁶ It contained fundamental findings, which are still valid, concerning the formal analysis of glass seals, their classification, and comprehensive interpretation. From our current perspective, we may state, together with the progress of studies on this type of finds in other European countries,⁷ that both works became the impulse for other scholars to take up this research problem and set out a number of future research trends.

The result of the above-mentioned inspirations was the creation and publication in Poland during the last two decades of eight papers dedicated exclusively to glass seals and bottles.⁸ Those artefacts have also become a subject of a wider discussion in connection with descriptions of collections of glass artefacts that included such finds discovered in different parts of modern-day Poland.⁹ As a result, the subject of glass seals has been discussed relatively often in the context of publications on other types of modern glass vessels.¹⁰ However, researchers have concentrated mainly on the set of information discussing: the state of preservation and the appearance of finds, in particular of the symbols impressed on seals, their function and origin, and enumerating other sites with such finds. Among more recent publications, only a few authors have adopted a more comprehensive approach to studies on artefacts with glass seals.¹¹

To gain an approximate, comprehensive image concerning the current state of glass seals finds from the territory of contemporary Poland recorded after the year 1987 basic data are compiled in Table 1. That set of information includes selected artefacts, i.e. varying in terms of the location and the category of sites on which they were discovered, and simultaneously recorded in publications that made it possible to establish in the relevant assemblages of finds the proportion between artefacts with glass seals and other the remaining glass finds without any stamps or markings.¹²

⁶ Gołębiowski 1997.

⁷ This phenomenon is manifested through, among other things, several key works published at the end of the 20th century and the beginning of the 21st century, including: Friese and Friese 1992; van den Bossche 2001; Humbsch 2001; Humbsch 2002.

⁸ Woźny 2001; Siwiak 2003; Siwiak 2004; Krukowska 2007a; Siwiak 2007a; Siwiak 2007b; Siwiak 2009; Szczepanowska 2013.

⁹ E.g. Nawracki 1999, 91-93; Krukowska 2007b, 35-46; Antowska-Gorączniak 2012, 151, 194, Pl. 6; Rais-Kufel and Kufel 2013, 237-278; Wojciechowska 2015; Grabny 2016, 261-263; Wilgocka 2016, 227-228, 238-239, Figs. 5 and 6; Baturo 2017, 217-223, 235, Pl. 5; Baturo and Kasprzak 2018a; Baturo and Kasprzak 2018b.

¹⁰ See Bis 2020a.

¹¹ Woźny 2001; Siwiak 2003; Siwiak 2007a; Szczepanowska 2013; Baturo 2017.

¹² I have taken into consideration those publications, which in addition to the number of glass seals provided information about the total number of discovered bottles and their fragments or the total number of glass vessels.

² More information on this subject e.g. in Morgan 1976, 7-23; Polak 1981, 234-239, 261-264; Dumbrell 1983, 13-23; van den Bossche 2001; Veit and Huey 2014, 56-60; Jeffries and Major 2015, 132-133. Since there are numerous publications on this subject, I list here only several selected works. Research questions concerning the history of using glass bottles with seals have also been discussed many times in Polish archaeological publications. For this reason, in this paper, I decided to include only a short reference.

³ See Bis 2020a.

⁴ E.g. Cnotliwy et al. 1972, 216; Gajewska and Kruppé 1973, 629, footnote 20.

⁵ Kajzer 1981.

Table 1. Selected examples of glass seals (loose and with glass vessels) dated to the 17th-19th centuries from the territory of Poland (compiled by M. Bis, based on data contained in publications)

No.	Place of discovery	Number of glass vessels / Number of bottles	Number of seals, glass bottles or their fragments with seals	Types of signs on seals	Dating	Publication
1	Bąkowa Góra, manor house, Łódzkie Voivodeship	875 fragments of glass vessels / no data	8* seals	descriptive signs - with trademarks (FJL, TK); numerical (G1, G1/2, 1 KW); 3 without a stamp	18 th century	Głosek 1998
2	Białystok, palace (Pałac Góscinny, 2 Kilińskiego Street, site 2), Podlaskie Voivodeship	no data / 309 bottle* fragments (including: 2 squat bottles)	1 specimen (a piece of a squat bottle with a seal)	a descriptive sign - with a town (?) name, partly preserved (Do [...] to [...])?	2 nd half of the 18 th century	Pawlata 2010
3	Brześć Kujawski, priory (Dominicans), Kujawsko-Pomorskie Voivodeship	257 fragments of glass vessels / 45 bottles	3 bottles with seals	a descriptive sign - with the name of the glass workshop (Art. Huta Zo[...]); numerical signs (K1, K2)	2 nd half of the 18 th century–1820s-1830s	Andrzejewska 1996
4	Bydgoszcz, town (plot located at 33 Pod Blankami Street, site 556), Kujawsko-Pomorskie Voivodeship	no data / 121 bottle fragments (storage containers and pharmaceutical glass)	5 seals	a descriptive sign - with the name of the glass workshop (Glas Fab [T]hu[re]), symbols (star, eagle), monogram (K)	2 nd half of the 18 th century – 2 nd and 3 rd quarter of the 19 th century	Siwiak 2002
5	Bydgoszcz, town (Przedmieście Gdańskie, site 533), Kujawsko-Pomorskie Voivodeship	no data / 28 bottle fragments	18 seals	descriptive signs - with the name of the glass workshop (Glas Fabrik Clementienhof), the glass workshop and town (Baeren Walde)	turn of the 18 th century	Siwiak 2009
6	Chojnice, school (Jesuit College), Pomorskie Voivodeship	990 fragments of glass vessels / 741 bottle fragments	8 seals	descriptive signs - with the name of the town (London, Londn, Londen)	18 th -19 th century	Garas and Trzcinski 2010
7	Dubno, manor house, Podlaskie Voivodeship	1627 fragments of glass vessels / no data	2 seals	descriptive signs - with the name of the town (London) and unidentified, partly preserved (Crus [...] Hirs [...] Bo)	18 th century	Garas and Karwowska 2013
8	Elbląg, town (Old Town), Warmińsko-Mazurskie Voivodeship	no data / many thousands of bottle fragments	37 bottles with seals (and 11 fragments of necks with stamped reference numbers)	descriptive signs - with place names (including London in different spelling options); trademarks (FR), numerical (e.g. 1/2Q, 1/26, N ^o), symbols (crown?, a bunch of grapes), 8 seals without any imprints.	end of the 17 th -18 th century; 19 th century	Gołębiewski 1997

No.	Place of discovery	Number of glass vessels / Number of bottles	Number of seals, glass bottles or their fragments with seals	Types of signs on seals	Dating	Publication
9	Gdańsk, town (Market Hall, site 5), Pomorskie Voivodeship	313 fragments of glass vessels / 205 bottle fragments (including: 94 from square bottles, 108 from cylindrical, 3 from demijohns)	1 specimen (a piece of a rectangular bottle with a seal)	descriptive signs - with the name of the town (Londo)	end of the 17 th -18 th century	Krukowska 2007b
10	Gdańsk, town (Szafarnia-Angielska Grobla, site 100), Pomorskie Voivodeship	3940 fragments of glass artefacts / 2405 fragments of bottles and demijohns	8 specimens (including: 5 bottles with seals and three loose seals)	descriptive signs - with the name of the town (London, Londo, Dantzig); 1 seal without a sign	end of the 17 th - 18 th century	Szczepanowska 2013
11	Łowicz, town (New Town Hall), Łódzkie Voivodeship	1309 fragments of glass vessels / 240 bottle fragments	6 fragments of bottles with seals	a descriptive sign - with the name of the glass workshop (Huta Olichawska, Huta Olichawsky), monograms (S.F, H.R), numerical (K2), symbols (crown?), 1 illegible sign	c. 2 nd half of the 17 th - beginning of the 19 th century	Poturska 1999
12	Pomorzanki, village, Łódzkie Voivodeship	504 fragments of glass vessels / 262 bottle fragments	1 seal	trademark (?) - name of the manufacturer or the consumer (?), partly preserved (Zskow)	18 th -beginning of the 19 th century (?)	Słomska 2013
13	Poznań, town (Stawna/Żydowska Street), Wielkopolskie Voivodeship	203 fragments of glass vessels / 172 bottle fragments	5 seals	descriptive signs - with the name of the town (Ondo, Onde), trademarks (Ha [...] Glais; Hartwig), symbols (the Star of David, fish)	2 nd half of the 18 th -20 th century	Kufel 2018
14	Puck, town (town hall) Pomorskie Voivodeship	2644 fragments of glass vessels / 72 bottle fragments and 4 whole bottles (reconstructed)	3 seals	descriptive signs - with the name of the town (London, Lipusch), miscellaneous sign (Secken)	4 th quarter of the 18 th -1 st half of the 19 th century	Starski 2015
15	Sandomierz, town (Collegium Gostomianum), Świętokrzyskie Voivodeship	540 fragments of glass vessels / 204 bottles	1 seal	a descriptive sign or a trademark (HP)	17 th -18 th century	Rubnikowicz 1996, 447, Tab. V:14
16	Siedlęcin, tower castle, Dolnośląskie Voivodeship	2539 fragments of glass vessels / 29 storage bottles*	3 seals	a descriptive sign - with the name of the town and glass workshop (Kolzig; [C]rlstahl); numerical sign (K 7/4 Q)	year 1765; from 1754 to the 1890s	Grabny 2016
17	Stargard, town (quarter V), Zachodniopomorskie Voivodeship	186 fragments of glass vessels / 158 bottle fragments	3 seals	descriptive signs - with the name of the town and glass workshop (Marienwalde 1739; M. L / Bernsee / Glasshot[t]e); a trademark (?) (ICK)	end of the 17 th -mid-19 th century	Majewski 2012

No.	Place of discovery	Number of glass vessels / Number of bottles	Number of seals, glass bottles or their fragments with seals	Types of signs on seals	Dating	Publication
18	Stargard, church (of the Augustinians), Zachodniopomorskie Voivodeship	no data / 2589 bottle fragments*	33 (?) seals (including: 28 identified loose finds and 5 (?) unidentified)	descriptive signs - with the name of the town and glass workshop (e.g. Piep Stock, Marienwalde, Cantreck), a trademark (Bergemann Erben), with unclear words (Minch), numerical (No 3; 1)	17 th -19 th century	Wilgocka 2016
19	Średnia Huta, glass workshop, Kujawsko-Pomorskie Voivodeship	1083 fragments of glass vessels* / 241 bottle fragments	3 seals	descriptive signs - with the name of the town (Londo)	18 th century	Rubnikowicz 1989a
20	Szczecin, castle (Castle of the Dukes of Pomerania), Zachodniopomorskie Voivodeship	no data / 68 bottle fragments*	9 seals	descriptive signs - with the name of the town and glass workshop (Annenwalde, Marienwalde)	18 th -19 th century (after 1637)	Cnotliwy 2014
21	Toruń, castle, Kujawsko-Pomorskie Voivodeship	226 fragments of glass vessels / 61 bottle fragments	7 seals	descriptive signs - with place names (London), with a monogram (R), with an unclear sign (KWD/Y); 2 without a stamp	18 th century	Nawracki 1999
22	Warsaw, town (Plac Zamkowy), Mazowieckie Voivodeship	no data / over 17,000 bottle fragments	59 seals (including: 4 on whole bottles and 15 on bottles preserved in fragments)	descriptive signs - with names of glass workshops (e.g. Piekarska, Stanislawowa, Jezewicka, Blendow, Lochow); with unclear initials (e.g. HP; WD HW; FK); numerical signs - identifying measures (3 Quart, KIII); 7 without a stamp	2 nd half of the 18 th -19 th century	Baturo 2017
23	Warsaw, town (town hall), Mazowieckie Voivodeship	948 glass vessels / no data	2 seals	descriptive signs - with the name of the town (Dantzig, Londen)	4 th quarter of the 18 th -1 st quarter of the 19 th century	Blusiewicz 2013
24	Wrocław, town (Ostrów Tumski), Dolnośląskie Voivodeship	2265 fragments of glass vessels / 33 (?) bottle fragments	5 seals	a descriptive sign - with the name of the town and glass workshop (Corin), monograms (H E; K R Q; K), shape (triangle)	Modern Period	Siemianowska 2015

* calculations made by the author based on data included in the publication

Observations made on the basis of the current state of research

Based on the collated data it is possible to state unequivocally that vessels with such seals and such loose finds are relatively rare. The total number of artefacts listed in Table 1, covering 24 regions of archaeological excavations, was over 220 specimens. Other sites (around 60 in total), where archaeologists discovered glass seals (overall at least 330) and which were mentioned in publications from that time include: Bierzwnik,¹³ Biskupice,¹⁴ Breń,¹⁵ Chełmno,¹⁶ Darłowo,¹⁷ Fordon,¹⁸ Gdańsk,¹⁹ Gdańsk – Wisłoujście,²⁰ Gniewkowo,²¹ Inowrocław,²² Jeleń,²³ Karczyn,²⁴ Koszalin,²⁵ Krosno Odrzańskie,²⁶ Łabiszyn,²⁷ Łomża,²⁸ Łódź,²⁹ Myślibórz,³⁰ Pakość,³¹ Poznań,³² Poznań – Ostrów Tumski,³³ Przeborowo,³⁴ Radom,³⁵ Radoszyce,³⁶ Słaboszewo,³⁷ Stargard,³⁸

¹³ Glass workshop, total number of glass seals – 81 (Markiewicz 1999, 180, no figures), including: 46 seals (Stolpiak and Świercz 1997, 42-45, no figures) and 13 seals (Stolpiak and Świercz 1998, 39-41, no figures).

¹⁴ Church, 1 seal (Ruszkowska 2007, 148, Fig. 3:6; 149-150).

¹⁵ Glass workshop, 1 seal (Mucha 1994, 68, 79, Fig. 10:2).

¹⁶ Near monastery, 3 seals (Olczak 1991, 78-79, Fig. 5).

¹⁷ Old Town, 3 seals (Kuczkowski 2016, 161-162, nos. 1.1-1.3).

¹⁸ Town, 20 seals, including: 17 seals (Woźny 2001, 248-251) and 3 seals (Siwiak 2003, 60-61).

¹⁹ Town, 8 items, including: 3 seals (Krukowska 2007a, 434-435) and 5 seals (Zespół Przedbramia, Krukowska 2016, 212-215, Fig. 4).

²⁰ Fortress, 3 seals (Szczepanowska 2015, 307-310, Fig. 108:19).

²¹ Village, 5 seals (Sulkowska-Tuszyńska 2018, 123-124; 195, Figs. 92-93).

²² Old Town, 36 seals (Siwiak 2007b, 77).

²³ Settlement (?), 1 seal (Siwiak 2004, 157-158, Fig. 1:a).

²⁴ Settlement, 1 seal (Siwiak 2007b, 78-79, Fig. 1:4).

²⁵ Old Town, 3 items, including: 2 seals and 1 bottle with seal (Borkowski and Kuczkowski 2011, 45, Fig. 34:l-l; 97, Fig. 107).

²⁶ Castle, 1 seal (Dziedzic and Kałagate 2002, 77 and 162, Pl. IX:1).

²⁷ Castle, 5 seals (Siwiak 2007a).

²⁸ Town, at least 3 seals, including: undefined number of seals and 1 published (Jurzysta 2014, 103), as well as 1 seal (Bienia 2014, 151).

²⁹ Town, 1 seal (Dziubek et al. 2002-2003, 368, 380, Fig. 6:5).

³⁰ Town, 1 seal (Szymczyk 2016, 551).

³¹ Monastery, 1 seal (Siwiak 2007b, 78-79, Fig. 1:2-3).

³² Town, undefined number of seals, 1 published (Wawrzyniak 2000, 74, Fig. 17).

³³ Town, 5 seals and one mark left by the seal on a fragment of a glass bottle (Antowska-Gorączniak 2012, 151, 194, Pl. 6:1-5).

³⁴ Glass workshop, 2 seals (Mucha 1997, 118 and 114, Fig. 3).

³⁵ Castle, 1 seal (Lechowicz 2012, 124, [Fig.] 108).

³⁶ Castle, 1 seal (Kajzer 1988, 143).

³⁷ Settlement, 1 seal (Siwiak 2007b, 79).

³⁸ Stargard, Old Town, total number: 86 seals, including: 2 seals (Burdziej et al. 2013, 348); 6 seals (Burdziej et al. 2013, 350, 374, Fig. 28:3-7, 10); 1 seal (Burdziej et al. 2013, 352, 379, Fig. 32);

Strzelno Klasztorne,³⁹ Toruń,⁴⁰ Trzemeszno,⁴¹ Warsaw,⁴² Warsaw – Royal Castle,⁴³ Warsaw – Wilanów,⁴⁴ Witów,⁴⁵ and Wrocław.⁴⁶

The total number of all finds mentioned in the collected publications would be at least 550. These numbers are only of an informative nature, as in several cases (Łomża,⁴⁷ Poznań,⁴⁸ and Trzemeszno)⁴⁹ the number of glass seals obtained from excavations was not specified in detail. No doubt, at a national level the number of the discovered seals is much higher, but those finds have not been mentioned in published research results.⁵⁰

Usually, on one site there were several to around a dozen of such finds. Greater numbers (several dozen specimens) were obtained only in a few cases, during archaeological excavations covering large areas – the Old Town in Elbląg (37 specimens), the area of the Augustinian church in Stargard (33?), and Plac Zamkowy (Royal Palace square) in Warsaw (59), as well as finds from the Old Town in Stargard (86 in total),⁵¹

49 seals (Burdziej et al. 2013, 353-354, 384, Fig. 39); 3 seals (Burdziej et al. 2013, 360, Fig. 69:4); 2 seals (Burdziej et al. 2014, 281, 291, Fig. 17:1-2); 11 seals (8 seals published, Burdziej et al. 2014, 378, 380, Fig. 11:1-8 and information about 11 seals, Szeremeta 2018, 390, 392, Fig. 5:1-8); 10 seals (Burdziej et al. 2014, 382, 389, Fig. 19:6-12); 1 seal (Bucka et al. 2015, 488, 491, Fig. 17:3); Old Town Market, 1 seal (Majewski 2017, 103-104, 106, Fig. 1:7). Stargard, town, total number: 13 seals, including: 5 seals (Kwiatkowski 2010, 103-104; 108, [Fig.] 8); 1 seal (Burdziej et al. 2013, 348-349); 5 seals (Burdziej et al. 2013, 349); 1 seal (Burdziej et al. 2013, 352, 379, Fig. 33); 1 seal (Bucka et al. 2017, 224).

³⁹ Settlement (?), 1 seal (Siwiak 2004, 157-158, Fig. 1:a).

⁴⁰ Old Town, 2 seals, including: 1 fragment of a glass bottle with a glass seal (Rubnikowicz 1989b, 76-77, Pl. II:1) and 1 seal (Siwiak 2007b, 80, footnote 20).

⁴¹ Monastery, several fragments of glass bottles with seals (Wiewióra 2000, 201-202, Fig. 90:5-6).

⁴² Ogród Krasieńskich, 2 seals (Meyza 2014, 34, 37, Pl. III: 1-2); town, 7 round seals (Lipiec 2017, 172-173, Fig. 5); Plac Zamkowy, 3 glass bottles with glass seals (Kozłowska 1994, 38, nos. 101-102; 39, no. 104).

⁴³ 2 glass bottles with glass seals (Kozłowska 1994, 36, no. 95; 41, no. 110).

⁴⁴ 1 seal without imprint (Andrzejewska et al. 2002-2003, 300).

⁴⁵ Monastery, 1 seal (Andrzejewski and Kajzer 2001, 334).

⁴⁶ Old Town, 1 fragment of a glass bottle with a glass seal (Nowosielska 1998, 250-251).

⁴⁷ Jurzysta 2014, 103.

⁴⁸ Wawrzyniak 2000, 74.

⁴⁹ Wiewióra 2000, 201-202.

⁵⁰ This is indicated by, among other things, information concerning finds from Bydgoszcz. Wojciech Siwiak in his work from 2009 stated that the total number of glass seals obtained to date from the area of the town was approximately 200 (Siwiak 2009, unpaginated), whereas publications contain descriptions of only 43 specimens from modern-day Bydgoszcz (including: 23 items, Siwiak 2002; Siwiak 2009; and separately listed 20 items from Fordon, Woźny 2001; Siwiak 2003).

⁵¹ See footnote 38.

from the Old Town in Inowrocław (36 items),⁵² and the Cistercian monastery in Bierzwnik (Marienwalde) (81),⁵³ the location of a post-medieval glass workshop.⁵⁴

The percentage of glass seals and glass vessels with seals compared to the total number of discovered storage bottles usually ranged between 1-4%, sometimes below 1%, and only in rare cases was as high as 10% (for the assemblage of finds from the castle in Toruń). The percentage of signed vessels compared to the total number of glass fragments discovered at individual sites was even lower – 0.1-0.6%.⁵⁵ Although these values give us only approximate information due to the selective nature of the compilation created for this paper, they still provide us with some notion of the scale of the phenomenon consisting in the use and presence of glass seals on the territory of Poland in the modern period. That low percentage may be the result of a number of factors. However, in this context, assumptions concerning the signing of only specific batches, series of products made to special (also individual) orders, seem to be fully justified.

The dating of the finds included in the discussed compilation generally falls to the period between the end of the 17th century to the second half of the 19th century, rarely exceeding either of these thresholds (the earliest dates being those concerning finds from the excavations at the site of the town hall in Łowicz – from around the second half of the 17th century and the tower castle in Siedlęcín as well as the Old Town in Elbląg the latest – until the 1890s). This conforms with the conclusions regarding the production and use of similar signs in western European countries.⁵⁶

Vessels with seals are usually standard products, of average quality, most common on the market, and do not differ from unsigned specimens.⁵⁷ They are made

⁵² Siwiak 2007b, 77, footnote 6.

⁵³ For brief information on these finds see Markiewicz 1999, 180; see also Stolpiak and Świercz 1997, 42-45; Stolpiak and Świercz 1998, 39-41.

⁵⁴ The latter three assemblages were not included in Table 1, due to insufficient information contained in publications about these finds.

⁵⁵ This remains in line with the findings made by Andrzej Gołębiowski, who in his work published 23 years ago (likewise based on the literature and archaeological finds available at that time) also estimated that the “percentage of bottles with impressed stamps in the preserved assemblages did not reach even 1%” (Gołębiowski 1997, 184).

⁵⁶ Among others, Morgan 1976; Dumbrell 1983.

⁵⁷ See Gołębiowski 1997, 185. At the beginning of the 19th century, the best and the most durable Polish bottles (appropriate for fizzy drinks and with a quality similar to that of English bottles) were believed to be vessels from Huta Sztabińska – glass workshop located in the village of Sztabin in Podlasie region (Włodarczyk 2017, 145, footnote 15). Currently there is only one artefact among

from green, greenish, or brown glass, with visible air bubbles. Since seals are usually found separately, with only small fragments of the bodies (upper parts of bottles), in most cases it was not possible to establish the specific shape and size of the vessel. They survived in Elbląg⁵⁸ and Warsaw.⁵⁹ They were attached to storage bottles with a round (cylindrical) or oval cross-section, as well as rectangular bottles (i.e. flasks),⁶⁰ in the place where the neck transforms into the body (on the shoulder) and where glass is thinner and more fragile, which possibly made those batches of glass products more prone to damage.

Due to the fragmentary preservation of the majority of vessels and the still small available source database, no correlations between the shape of the container and a specific type of markings were observed. In this respect, the only link is associated with finds with different versions of the name “London”, which – based on descriptions provided by authors or figures of finds – more often are rectangular vessels. Their shape was adjusted for transporting them in travel cases (*case bottles*). However, the search for more specific relationships between individual vessels and details of representations on the seals at this stage would be premature. Among Polish finds, we may only observe a greater proportion of cylindrical bottles than squat ones (representing the following types: *shaft and globe*, *onion bottles*, and *malet bottles*). This is linked to the chronology of Polish finds, as they are mainly vessels from the 18th and 19th centuries, which saw a gradual increase (and then the dominance) of such slenderer forms.⁶¹

Seals usually have small sizes, with diameters of around 3-4 cm and thickness below 3 mm. They are usually round (e.g. Figs. 1 and 2); only in few cases records showed a rectangular imprint, among finds from Warsaw (Fig. 7:b; another example see Fig. 2:c).⁶² This was the result of using a tool with an appropriate section. They also usually have a visible, convex rim made by the pressure created by the stamp being applied to the hot glass disc while attaching it to the

the published archaeological finds known from Łomża (Jurzysta 2014, 103; there is no figure depicting the seal).

⁵⁸ Gołębiowski 1997, 185.

⁵⁹ Kozłowska 1994, 36, 38-39, 41; Baturo 2017, 201-217.

⁶⁰ In the analysed archaeological materials I did not find any information about discoveries of bottles with glass seals that would have other shapes, for instance with triangular or octagonal bodies, which would also be manufactured around that time (such artefacts are mentioned in, e.g. Morgan 1976, 58-59, 68; Dumbrell 1983, 87-90, 141).

⁶¹ See e.g. Morgan 1976, 24-27; Dumbrell 1983, 100-119.

⁶² Baturo 2017, Pl. 5:4; Baturo and Kasprzak 2018b, 30, Figs. 1-2.

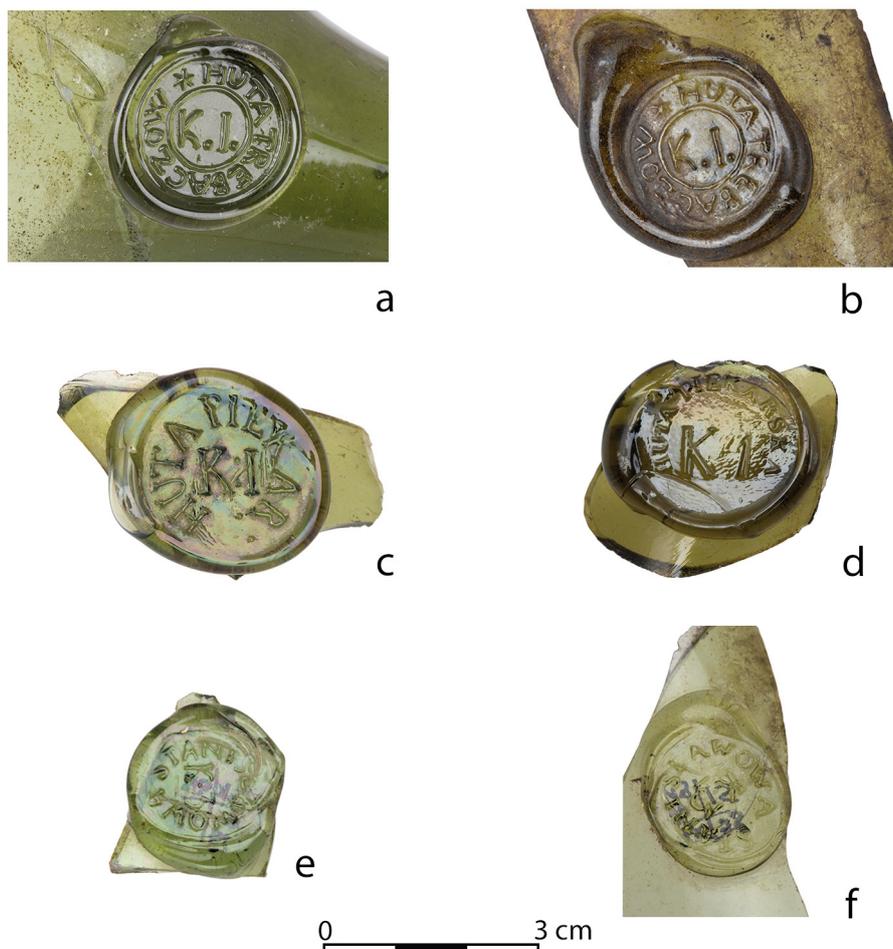


Fig. 1. Examples of glass seals from the end of the 18th – beginning of the 19th century. Unpublished Polish finds from the Tin-Roofed Palace in Warsaw: a-b – from Trębaczów glass workshop; c-d – from Piekarska glass workshop (in Piekary); e-f – from Stanisławów glass workshop. After Bis 2020b, Fig. 4. Photo M. Osiadacz.

surface of the bottle and constituting the excess of glass mass gathered around the imprint (other examples see Figs. 1 and 2:a-b, d).

Much less often the stamp is on the glass strip below the lip of the bottle (Fig. 3).⁶³ It is a separate and at the same time a simplified manner of signing glass containers, with a similar marketing as well as fiscal and inspection function. The signs were placed along a flattened circular glass tape (around 0.5-1 cm wide) under the rim of a bottle.⁶⁴ In exceptional cases, they

take the form of a quadrangular imprint.⁶⁵ Markings on glass tapes are schematic, limited to letters (including unrelated, not forming legible inscriptions) and combinations of letters and numerals referring to the serial numbers of products or beverages, capacity, etc.⁶⁶ (Fig. 3:a-d), without any pictograms. In a few cases they bear the name of a glass works (“H IEZEWIC:” or “H: IE[...]”, “H:LUTKOWSKA”, “H:SWYNC:”,⁶⁷ “H: WALOWI”)⁶⁸ (Fig. 3:e-f). Based on the collected material from Poland, it is possible to state that this method of counting post-medieval glass bottles was used much less often than the glass seals method.

⁶³ Polish researches call them signature discs (Gołębiewski 1997, 201) or signature strips (e.g. Baturo and Kasprzak 2019a).

⁶⁴ For this reason, it was not necessary to carry out additional technological actions consisting in the production of a glass disc. Such finds were recorded on several occasions: in Elbląg (11 finds, Gołębiewski 1997, 201), in Warsaw – the Old Town area (7 items, including: 2 specimens, Baturo and Kasprzak 2019b, 38; 3 specimens, Baturo and Kasprzak 2019c, 28-29; 2 specimen, Baturo and Kasprzak 2018c, 37) and the town (6 items, Lipiec 2017, 170-173, Fig. 1:c, 2:b; Fig. 3:a; Fig. 5:a, i-j, k), the monastery in Pakość (2 items, Siwiak 2007b, 78-79, Fig. 1:2-3) and the village

in Zajezerze (1 specimen, Siwiak 2004, 159). The total number of above mentioned items is 27.

⁶⁵ Lipiec 2017, 171, Fig. 6:a.

⁶⁶ See also Gołębiewski 1997, 200-201, Fig. 4:a-f.

⁶⁷ The same inscriptions are the imprints on round glass seals, see Baturo and Kasprzak 2018c, 37, Figs. 1-3; Baturo and Kasprzak 2019a, 26-17; Baturo and Kasprzak 2019c, 28-29, Figs. 1-4.

⁶⁸ Baturo and Kasprzak 2019b, 38, Figs. 1-2.

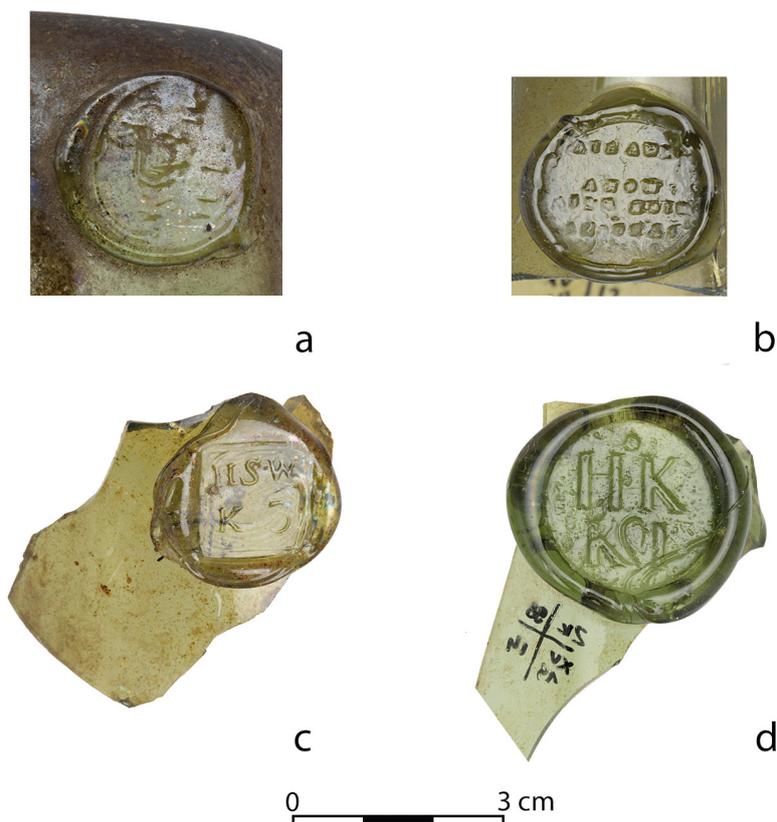


Fig. 2. Examples of glass seals from the end of the 18th – beginning of the 19th century. Unpublished Polish finds from the Tin-Roofed Palace in Warsaw: a-b – with illegible seals; c-d – with unidentified seals. After Bis 2020b, Fig. 6. Photo M. Osiadacz.

Seals differ in terms of their types, i.e. signs placed on seals and their iconography. These include individual signs, trademarks, monograms, as well as symbols, descriptive signs, and numerical signs.⁶⁹ They have the form of positives – raised imprint on a concave background. They are usually made shoddily, without much care about details of the drawing and the shape of letters. In many cases they were impressed unevenly, thus only a part of the original stamp is visible. Most probably this was caused by the intensive use of presses for creating imprints. If glass mass stuck to the surface of presses, symbols and inscriptions on subsequent imprints would become blurred. Thus, the period of their suitability for use could be quite short.⁷⁰ However, the examples analysed here show that those tools must have been used despite their faults, causing impressed images to be increasingly illegible. Another

⁶⁹ Types of signs on seal identified by A. Gołębiewski based on finds from the Old Town in Elbląg (Gołębiewski 1997, 187). I use that classification while discussing signs on glass seals in this paper. Only in the case of signs containing names of glass workshops I allocate them to the group of descriptive signs and not trademarks, as in my opinion, the first term provides a better characteristic of inscriptions on the analysed artefacts.

⁷⁰ See Friese 1995, 20.

explanation of the above-mentioned defects could be impressing the stamp in still too molten glass, as well as insufficient skill on the part of craftsmen creating matrices that were necessary for making presses, the latter becoming worn out, or because of the haste or shoddiness of glasshouse workers.

According to the review of published finds from Poland, the dominating type are descriptive signs, i.e. with names of glass workshops and names of places in which they were located. They appear as full words or abbreviations, without diacritic signs or misspelled. They include, among other things, markings associated with glass workshops from the territory of Western Pomerania (Fig. 4), which – as indicated by the data presented here – are currently represented by the greatest number of identified and relatively well dated specimens, mainly from Bydgoszcz (as well as from Fordon, which currently is part of Bydgoszcz), Elbląg and Stargard. The following glass workshops have been identified:

“BAERENWALDE” (Bärenwalde – Mysia Dziura,⁷¹ Bincze⁷² or other, located near Chojnice and

⁷¹ Gołębiewski 1997, 192-193, Fig. 2:a-b, d, f.

⁷² Siwiak 2009, unpagged.

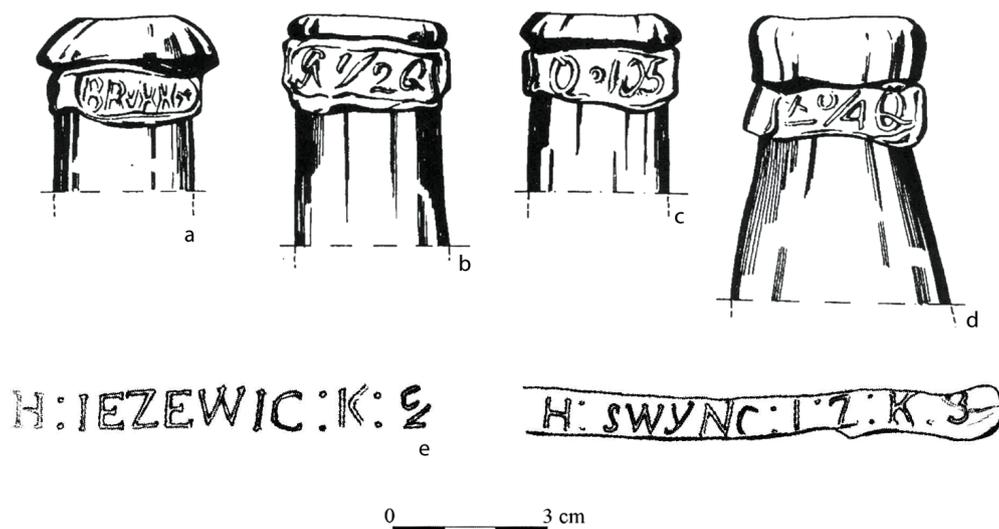


Fig. 3. Examples of signs on the glass strip below the lip of the bottle from the 17th-19th century discovered in Poland: a-d – finds from Elbląg. After Gołębiowski 1997, 200, Fig. 4:a-d; e-f – finds from Warsaw. After Lipiec 2017, 172, Fig. 5:j, k.

Kościerzyna)⁷³ (Fig. 4:a-c); “BATTROW” (probably Batorowo);⁷⁴ “BERNSEE” (Breń, 1660-1822/1824) (Fig. 4:y); “CANTRECK” (Łoźnica, 1806-1875) (Fig. 4:u-w); “FABRIQUE GRUNAU” (Gronowo) (Fig. 4:d-e); “LOTZEN” (Łośno, 1746-1785); as well as “MARIENWALDE” (Bierzwnik, 1607-1822/1824)⁷⁵ (Fig. 4:i-j, m-p). The remains of the latter glass workshop have been investigated by archaeologists. During excavation works carried out before 1999 archaeologists discovered in total 81 glass seals.⁷⁶ Those finds have not yet been fully published.

Other glass workshops that operated in that area and were identified on the basis of glass seals include: “MEHRENTHIN” (Mierzęcin?, 1797-1875) (Fig. 4:g); “PIEPSTOCK” (Podlipce, 1750 – after 1855) (Fig. 4:q-t); “PPOWO” (Chłopowo?);⁷⁷ furthermore “GLAS FABRIK CLEMENTIENHOF” and “[C]LEMENTIN” in

modern-day village of Klementynowo;⁷⁸ “GL[AS] FABRIK THURE” or “[GL]AS FA[BRIK] [THURMUHL]” (in Tur, from 1842 or 1845)⁷⁹ (Fig. 4:h), and Lipusz, with many spelling variations: “LIPPUSCH”,⁸⁰ “LIPUSCH”,⁸¹ “IPPUS” and “IPPUSCH”⁸² (Fig. 4:k-l). As indicated by the relevant inscriptions – “[ST]UTHOF”⁸³ (Fig. 4:x), another glass workshop that manufactured glass bottles with seals was located in the village of Stuthof (currently within the administrative area of Szczecin) and operated from 1821 until the mid-19th century.

Products of five more glass workshops were also registered: „HAMMERSCHE GLAS FABR.”⁸⁴ or “HAMMER Glas F” (Hammer[sche] Glas F[abrik]) (Rudnica, 1749-1855) (Fig. 4:f); as well as unspecified “GLAS MÜHL” – on seal found in Gniewkowo,⁸⁵ ANNENWALDE” (modern-day Germany, Brandenburg, 1755-1867) and “GRIMTZ” (Grimnitz, located near Potsdam), which are also known, e.g. from finds discovered in Szczecin,⁸⁶ whereas from Wrocław comes the seal

⁷³ Sulkowska-Tuszyńska 2018, 123, 195, Fig. 93:c.

⁷⁴ Sulkowska-Tuszyńska 2018, 123, 195, Fig. 92:a.

⁷⁵ Woźny 2001, 246, Fig. 1:5-6; 247, Fig. 2:1; 249-250; Siwiak 2007b, 77, footnote 6. Cnotliwy 2014, 278. The name of the glass works in Marienwald is known in different versions from the seals found in Stargard, e.g.: “KON PR MARIENWALDSCHER GLASFABRIQUE” (Burdziej et al. 2013, 349, 353). Other finds from Stargard, e.g.: Burdziej et al. 2013, 348-350; Bucka et al. 2015, 491, Fig. 17:3; Bucka et al. 2017, 224; Wilgocka 2016, 227; Szeremeta 2018, 390.

⁷⁶ Stolpiak and Świercz 1997, 42-45; Stolpiak and Świercz 1998, 39-41; Markiewicz 1999, 180.

⁷⁷ Gołębiowski 1997, 192-195; finds from Stargard, e.g.: Kwiatkowski 2010, 103, 108, Fig. 8; Burdziej et al. 2013, 354; Wilgocka 2016, 227-228, 238, Fig. 5; finds from Fordon: Woźny 2001, 250-251.

⁷⁸ Siwiak 2007a, unpagged, Fig. 7:1-2; Siwiak 2007b, 78-79, Fig. 1:2.

⁷⁹ Sulkowska-Tuszyńska 2018, 123, 195, Fig. 93:a; Siwiak 2004, 157-158, Fig. 1:a; Siwiak 2007b, 78-79, Fig. 1:3-4.

⁸⁰ Kuczkowski 2016, 162, no. 1.3; Woźny 2001, 247, Fig. 2:2.

⁸¹ Starski 2015, 160-163, Fig. 141:2.

⁸² Gołębiowski 1997, 194, 200, Fig. 4:g, h.

⁸³ Wilgocka 2016, 228, 239, Fig. 6:6-7.

⁸⁴ Woźny 2001, 247, Fig. 2:3; 251; Siwiak 2007a, unpagged; also on find from Myślubórz (Szymczyk 2016, 551) and probably on the item from Krosno Odrzańskie (Dziedzic and Kałagate 2002, 77, 162, Pl. IX:1).

⁸⁵ Sulkowska-Tuszyńska 2018, 123-124; 195, Fig. 93:b.

⁸⁶ Cnotliwy 2014, 277-278. The author incorrectly identified the latter seal as coming from the town of Krynica. Another item

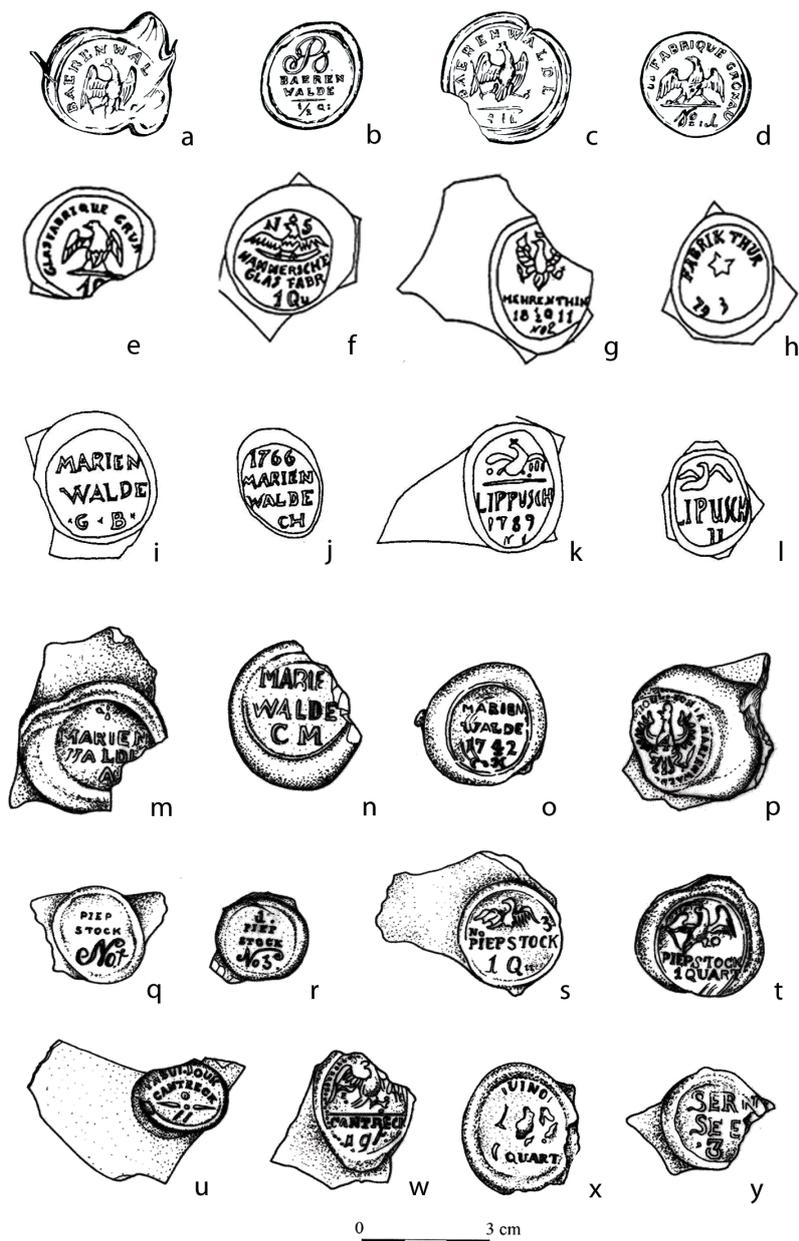


Fig. 4. Examples of glass seals with signs representing individual glass workshops in Western Pomerania from the 17th-19th century discovered in Poland : a-d – finds from Elbląg. After Gołębiewski 1997, 193, Fig. 2:a-d; e-l – finds from Fordon. After Woźny 2001, 246, Fig. 1:5-6, 8-9; 247, Fig. 2: 1-4; m-y – finds from Stargard. After Wilgocka 2016, 238, Fig. 5:1-2, 5-6, 9-10, 12, 14, 17-18; 239, Fig. 6:1, 6.

“CORIN”, which refers to the glass workshop located in Chorin, near Eberswalde (in Brandenburg).⁸⁷ Associating the newly discovered artefacts from that area with the functioning of individual workshops is facilitated by the already available publications of German researches concerning glass workshops and their trademarks.⁸⁸

related to the glass workshop in Annenwalde was found in Breń, Mucha 1994, 68, 79, Fig. 10:2.

⁸⁷ Siemianowska 2015, 224, Fig. 10:g. The author did not identify the manufacturer of that artefact.

⁸⁸ In particular Friese and Friese 1992; Humbsch 2001; Humbsch 2002; Humbsch 2006.

Markings associated with Mazovian glass workshops (Fig. 5:a-g) – several workshops located near Warsaw, which recently became the subject of research focusing on the recording of finds and their correlations with written records and cartographic sources. These workshops are characterised by the following signs discovered during excavations carried out in Warsaw: “BLENDOW” and „BLENDÓ” (a glass workshop that operated in Błędów, in the years 1801-1806/1807)⁸⁹ (Fig. 5:d-e); “H: JEZEWIC:” (Huta Jeżewicka – Jeżewice

⁸⁹ Kozłowska 1994, 38, no. 101; Baturo 2017, 221; Baturo and Kasprzak 2018b.

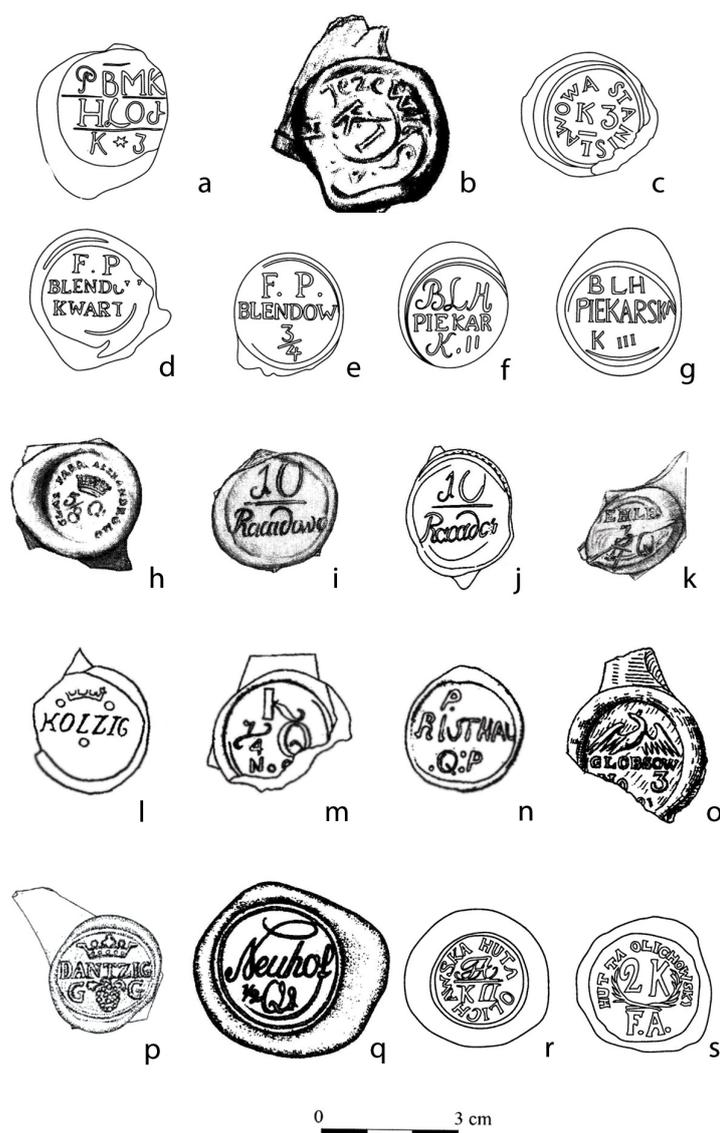


Fig. 5. Examples of glass seals with signs representing individual glass workshops in Mazovia (a-g), in Greater Poland (h-k, o), in Silesia (l-n), in Gdańsk Pomerania (p-q), and unidentified glass workshops (r-s) from the 17th-19th century discovered in Poland: a-g – finds from Warsaw. After Baturo 2017, 235, Pl. 5:5, 9, 17-20; Lipiec 2017, 172, Fig. 5:g; h-i, k – finds from Poznań. After Antowska-Gorączniak 2012, 194, Pl. 6:1, 3-4; j – find from Fordon. After Siwiak 2003, 60, Fig. 1:2; l-n – finds from Siedlęcin. After Grabny 2016, 271, Pl. 2:9-11; o – find from Przeborowo. After Mucha 1997, 114, Fig. 3:1; p-q – finds from Gdańsk. After Krukowska 2007a, 434, Fig. 4; Krukowska 2016, 213, Fig. 4:c; r-s – finds from Łowicz. After Poturalska 1999, 319, Fig. 1:2-3.

glass workshop, 1836-1840, previously Huta Tartak – Tartak glass workshop, 1835-1836)⁹⁰ (Fig. 5:b); and “H: WALOWI” (Huta Wałowska – Wałowska glass workshop, 1830-1839);⁹¹ as well as “HEINZ STRZIZE” (in Strzyżewskie Budy);⁹² “HLO” (in Łochów)⁹³ (Fig. 5:a); “PIEKARSKA”, also spelled “PIEKARY”

(in Piekary, c. 1803-1839)⁹⁴ (Fig. 5:f-g; other examples Fig. 1:c-d); and „STANISLAW”⁹⁵ or “STANISLAWOWA” (in Stanisławów, which operated in two stages: the first glass workshop – 1796-1801/1803; and the second glass workshop – 1805-1806?)⁹⁶ (Fig. 5:c; other examples Fig. 1:e-f).

Production was also confirmed in glass works located in Lutkówka (in the years 1838-1851/1852),

⁹⁰ Baturo and Kasprzak 2019c; other finds: Lipiec 2017, 172-173, Fig. 5:a, f-h, j.

⁹¹ Baturo and Kasprzak 2019b.

⁹² Baturo 2017, 220.

⁹³ Baturo 2017, 219.

⁹⁴ Baturo 2017, 221-222.

⁹⁵ Kozłowska 1994, 41, no. 110.

⁹⁶ Baturo 2017, 219; Baturo and Kasprzak 2018d.

Among the an unidentified Polish glass workshops, there is one hiding behind the name “HUTA OLICHAWSKA” and “HUTA OLICHAWSKY”¹¹⁰ (Fig. 5:r-s), which probably was located somewhere in central Poland, assuming that it operated near the place of the discovery (in Łowicz).¹¹¹

Glass workshops that operated in more distant locations – most probably in Charlottenburg (currently a part of Berlin), in Bad Pyrmont in Westphalia, and in the Netherlands, as indicated by artefacts from, respectively, Gdańsk, with the inscription “H. Faselow. Charlottenburg”;¹¹² from Stargard, with the signs “PYR[...]ONT W[...]TER”, „[...]RMONT WATI R” and “[...]RMONTER STAHLWASSE[...]”¹¹³ (Fig. 6:a-c), and from Elbląg signed “CON STANTIA WYN”¹¹⁴ (Fig. 6:e-f). Another bottle, with an inscription in the Cyrillic alphabet “[...] ЕНБЕР[...]Ъ”¹¹⁵, discovered in Łomża, most probably comes from the Russian Empire.

Other reordered specimens include symbols that most probably refer to the capacity of individual vessels, in the form of Arabic and Roman numerals and fractions (i.e. numerical signs) or letters – abbreviations or acronyms of units of capacity used in measuring liquid commodities. Producing bottles of a certain size and signing them appropriately was regulated and monitored by the state. For the Kingdom of Poland ordinances concerning the capacity of bottles were issued in the years 1819 and 1830,¹¹⁶ while for Prussia – in 1816.¹¹⁷ Primarily they

were supposed to prevent the manufacturing of non-standard bottles. Signs found on published specimens include, for instance: “3”, “III”, “¾”, “III K” or “K 3” (i.e. three half-pints; letter *K* – from the Polish word *kwarta* – quart)¹¹⁸ – on seals discovered in Warsaw¹¹⁹ (Figs. 5:a, e and 7:b-c, g; other examples see Fig. 1:e-f, 2:c); “¾” – on the artefact discovered in Toruń¹²⁰ (Fig. 7:h); “Q” (i.e. a quart from the Latin *quarta pars* – the fourth part)¹²¹ – on seals discovered in Bydgoszcz,¹²² “1 Qua[rt]” – on the item from Krosno Odrzańskie¹²³ and “K 4” – on finds from Warsaw;¹²⁴ “K 1” and “K 2” – on bottles discovered in Brześć Kujawski,¹²⁵ and in the variation “K II” and “2 K” recorded in the assemblage of glass from Łowicz;¹²⁶ (Fig. 5:r-s) or “1 Kw” – on find from Bąkowa Góra¹²⁷ (Fig. 7:j; other examples see Fig. 1:a-d). The last five signs are interpreted as units of measurement equal to one or two half-pints. There are also known artefacts with signs “G ½” and “G 1” found in Bąkowa Góra (Fig. 7:i, k), interpreted as the capacity of half a gallon and one gallon¹²⁸ – the measurement used in English-speaking countries. The capacity expressed in a unit used in the Russian Empire (since 1835), including in the Congress Poland (since 1849), equal to “1/20 ВЕДРО”¹²⁹ was impressed on a bottle discovered in Łomża.¹³⁰

The sign “IX” or “XIX” with raised dots in the circumference that filled the impression on the seal recorded in Łódź¹³¹ is perhaps a series number.

¹¹⁰ Poturska 1999, 318-319, Fig. 1:2-3.

¹¹¹ That manufacture was not recorded in the inventory of glass workshops operating in Poland in the second half of the 18th century and the first half of the 19th century compiled by Zofia Kamińska (see Kamińska 1974, 94-97, Map 5).

¹¹² Krukowska 2016, 213.

¹¹³ Wojciechowska 2015, 186-187, 199, Fig. 9:1-2. See also Kwiatkowski 2010, 103; 108, [Fig.] 8:5 (the author incorrectly deciphered the inscription on that seal).

¹¹⁴ Gołębiowski 1997, 196-197, Fig. 3:b-c. The author suggested that these bottles come from Constance, on the border of contemporary Germany and Switzerland. After Roy Morgan the bottles with this inscription are Dutch vessels bearing the name after Constance, wife of Governor van der Stell (Morgan 1976, 102).

¹¹⁵ The discussed chapter does not contain any description of the seal and it is not possible to decipher the full inscription in the circumscription (Bienia 2014, 151). Most probably it is the name of the glass workshop or the name of its owner.

¹¹⁶ They ordered using half-pint, pint, pint and a half, quart, three-quart bottles, etc. and indicating the “capacity of bottles with a glass stamp on the shoulder or the bottom” (Włodarczyk 2017, 145, footnote 15).

¹¹⁷ Siwiak 2007a, unpag. The unit of measurement that was introduced at that time – 1 *Berliner Quart* equalled to 1.145 litre, whereas ¾ *Berliner Quart* – approximately 0.86 litre. In Saxony (since 1836), Bavaria (since 1868), and Mecklenburg (since 1872), the capacity of bottles was given only in litres. The signing of ready-made bottles was previously regulated by Prussian decrees, e.g. from the years 1728, 1733, 1739 (see also Mucha 1997, 118).

¹¹⁸ According to Polish units of capacity used in measuring liquid commodities prior to the Partitions of Poland, which were still used in the 19th century, *kwarta* (*quart*) = 0.942 litre, and *kwatka* = 0.235 litre (Ihnatowicz 1967, 42, tab. 26).

¹¹⁹ Batur 2017, 218-222; other finds: Kozłowska 1994, 38, no. 102; Lipiec 2017, 142, Fig. 5:1; 198.

¹²⁰ Nawraci 1999, 92-93, Fig. 15:d.

¹²¹ *Quart* (*kwarta*) = 1.17 litre, is a Prussian unit of measuring liquids capacity used until 1816 (Ihnatowicz 1967, 46, Tab. 37). In the years 1817-1872 the official unit of measurement was the so-called *Berliner Quart* (Berlin quart) = 1.145 litre (Ihnatowicz 1967, 47, Tab. 39).

¹²² Siwiak 2002, 24, Fig. unnumbered, nos. 3-5; Siwiak 2003, 60.

¹²³ Dziedzic and Kałagate 2002, 77.

¹²⁴ Lipiec 2017, 172, Fig. 5:c-d; 199.

¹²⁵ Andrzejewska 1996, 129.

¹²⁶ Poturska 1999, 318-319, Fig. 1:3-4.

¹²⁷ Głosek 1998, 44; 74, Pl. XII:4.

¹²⁸ Głosek 1998, 44; 74, Pl. XII:1-2, 5. *Gallon* – is a unit of measurement which in England around 1835 was equal to 4.54 litres (Ihnatowicz 1967, 58, Tab. 58), whereas the the *wine gallon*, i.e. the old English unit of measurement equalled to 3.7852 litres (Ihnatowicz 1967, 79).

¹²⁹ *Wiedro* (*wiadro*, bucket) is a Russian unit of capacity used in measuring liquid commodities equal to 12.299 litres (Ihnatowicz 1967, 49, Tab. 43).

¹³⁰ Bienia 2014, 151.

¹³¹ Dziubek et al. 2002-2003, 368, 380, Fig. 6:5.

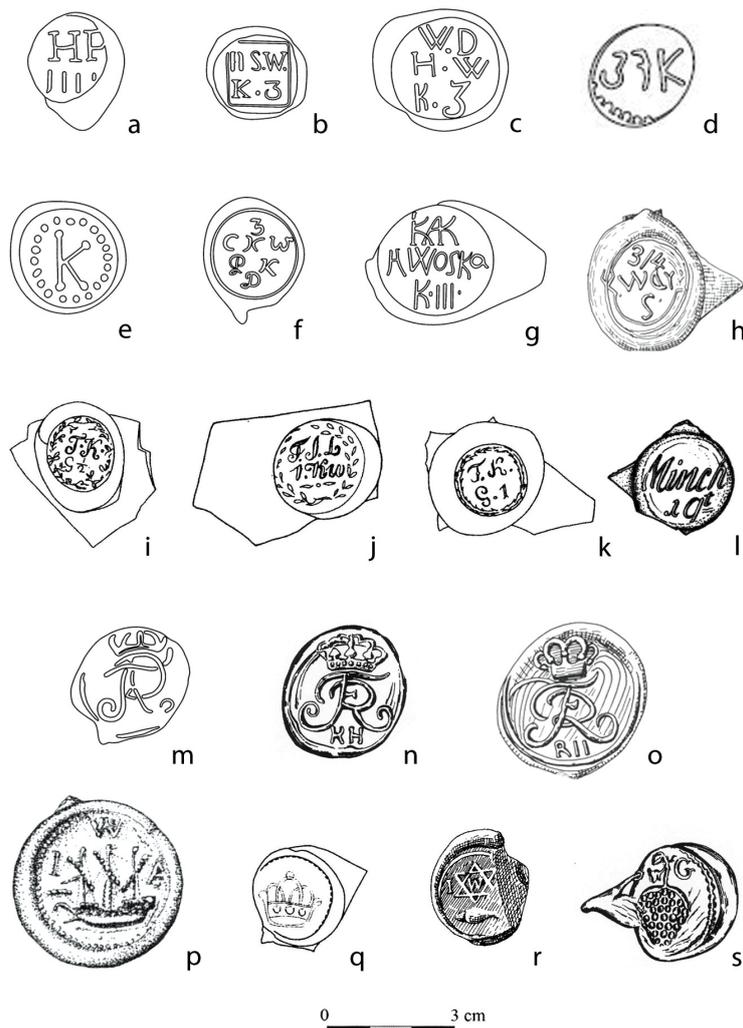


Fig. 7. Examples of glass seals with unidentified inscriptions and monograms (a- l), with monograms in the form of stylised letters “FR” (m-o), and with iconographic symbols (p-s) from the 17th-19th century discovered in Poland: a-g, m – finds from Warsaw. After Baturó 2017, 235, Pl. 5:3-4, 7-8, 10-11; 16, 24; h, o, r – finds from Toruń. After Nawracki 1999, 89, Fig. 12:b; 93, Fig. 15:d-e; i-k – finds from Bąkowa Góra. After Głosek 1998, 74, Pl. XII:2, 4-5; n, s – finds from Elbląg. After Gołębiowski 1997, 197, Fig. 3:a, g; p – find from Gdańsk. After Krukowska 2007a, 434, Fig. 6; q – find from Fordon. After Siviak 2003, 60, Fig. 1:1.

On the territory of contemporary Poland archaeologists also discovered seals with signatures in the form of signatures made from several letters put together, which now are incomprehensible, for instance: “AB” on seal from Chełmno;¹³² “IDB” – from Raciążek;¹³³ “CKW”, “F.K”, “PMBK”, “W.D H.W”HP S(?)AR”, “H.S.W”, “KAK H WOSK”, “WARSCH” – from Plac Zamkowy in Warsaw¹³⁴ (see Fig. 7:a-g; other examples see Fig. 2:c-d); “S.F”, “H R” – impressed on specimens from Łowicz;¹³⁵ “KWD(inverted)Y / S” – from

Toruń¹³⁶ (Fig. 7:h); “CFD”, “WPS”, “H”, “iG” – on artefacts from Elbląg;¹³⁷ as well as “H E”, “K R Q” – on finds from Ostrów Tumski in Wrocław;¹³⁸ “C W” and “G” on seals from Stargard,¹³⁹ “FW” – on one artefact from Szczecin,¹⁴⁰ “HP” – from Sandomierz,¹⁴¹ while “HAUBAQ” on a seal from Poznań.¹⁴² Perhaps they were monograms of the owners, tenants of glass

¹³² Olczak 1991, 78-79, Fig. 5:b.

¹³³ Kajzer 1981, 163-166.

¹³⁴ Baturó 2017, 219, 221-223.

¹³⁵ Poturalska 1999, 318-319, Fig. 1:1, 4.

¹³⁶ Nawracki 1999, 92-93, Fig.15:d.

¹³⁷ Gołębiowski 1997, 192.

¹³⁸ Siemianowska 2015, 224, Fig. 10:e, j.

¹³⁹ Wilgocka 2016, 228; 238, Fig. 5:16; 239, Fig. 6:4.

¹⁴⁰ Cnotliwy 2014, 279.

¹⁴¹ Rubnikowicz 1996, 447, Pl. V:14.

¹⁴² Kufel 2018, 181.

workshops or product distributors.¹⁴³ Their exact explanation seems to be possible through further studies on written records. The recurring letter H, which appears several times alongside other letters or words (W; R; E; AUBA), in some cases probably is an abbreviation of the word *huta* (glass workshop in Polish), whereas the remaining symbols next to that letter may refer to location, for instance, like in the case of the known sign “HLO” – from the glass workshop (*H[uta]*) in Łochów (*[LO]chow*) or “H:LUTKOWSKA” (*H[uta]* *Lutkowska*) near Warsaw. Most probably other markings, which have not yet been unidentified, played a similar role, although we still do not know if they are a part of an entire name or a monogram, for instance: “ZSKOW” on the specimen discovered in Pomorzanki,¹⁴⁴ or “MINCH” – an ambiguous sign on the artefact from Stargard¹⁴⁵ (Fig. 7:l).

Monograms in the form of stylised letters “FR” with a royal crown above them, presumably are initials of the Prussian king Frederick II the Great (reign: 1740-1786).¹⁴⁶ They were recorded, for instance, in Elbląg,¹⁴⁷ Toruń,¹⁴⁸ and Warsaw¹⁴⁹ (Fig. 7:m-o).

This group of seals is associated with another one, having a similar purpose, although artefacts from that category of finds are rarely recorded. These are stamps with individualised signs – i.e. inscriptions believed to be surnames or initials of individuals, companies, or manufacturers that ordered signed glass products (this category of finds will be hereinafter generally referred to as “trademarks”). Only a few such specimens have been identified, for instance, those discovered in Gdańsk: “I JO KEILER [...]” – a seal with the surname of a 19th-century merchant from Gdańsk, Johann Keiler, who owned a liqueur factory that operated in Gdańsk from 1814;¹⁵⁰ and “J.J. KEILER” (Fig. 6:g), “GTA”.¹⁵¹ In the group of finds from Stargard, there was a sign with the imprint: “BERGEMANN ERBEN”, i.e. the brewer from Szczecin named Bergemann

and his successor (Fig. 6:h)¹⁵². Initials “FI” (or “FJ”) found on another artefact probably refer to the glass merchant from the Duchy of Mecklenburg-Strelitz, who operated in the years 1840-1850.¹⁵³ The inscription “CGS / 177Z” was most probably made to the order of a Stargard distiller Speichert or the innkeeper Schiersmann, who around 1772 operated his inn near the Pyrzycka gate.¹⁵⁴ Whereas letters “FSH” were identified as an abbreviation referring to the name of a pharmacy – Fürstlich Sächsischen Hofapotheke. That sign was placed on a vessel manufactured by the glass workshop in Friedrichsthaler.¹⁵⁵ The product of the local alcohol distillery of vodkas and liqueurs, owned by the Kantorowicz Family (operated in the years 1823-1920), was indicated for the artefact from Poznań. In the latter case, however, the inscription was replaced with the Star of David motif.¹⁵⁶ The same factory was linked to another specimen, which was only partly preserved and came from the same site, bearing the inscription “HARTWIG”.¹⁵⁷ The name of a liqueur distillery, which functioned in Stargard in the years 1835-1945, and belonged to Ferdinand Johann Mampe,¹⁵⁸ is hidden behind the partially preserved inscription “SCH[UTZ d. WAARENBEZ.]”, preceded by: “[12.MA]I 1894 GESETZ z.”, on a seal found in Elbląg¹⁵⁹ (Fig. 6:d). It is an example of factory trademark used from that date. Furthermore, a trademark is probably the unidentified sign impressed on the surface of the bottle discovered in Dubno: “CRUS [...] HIRS [...] BO”.¹⁶⁰

Glass seals discovered on the territory of Poland and included in publications sometimes contain other elements, such as dates. Such dates, from the period from the beginning of the 18th century to the end of the 19th century. These dates are mainly noted on artefacts from the western part of modern-day Poland (see

¹⁴³ See Gołębiowski 1997, 187; Mucha 1997, 118.

¹⁴⁴ Słomska 2013, 142.

¹⁴⁵ Wilgocka 2016, 228; 238, Fig. 5:15.

¹⁴⁶ That sign resembles the monogram placed, for instance, on coins minted during the reign of that monarch, e.g. a pfennig from 1755, see Bucka et al. 2017, 224, 238, Fig. 28:1.

¹⁴⁷ Gołębiowski 1997, 198.

¹⁴⁸ Nawracki 1999, 92-93, Fig. 15:e.

¹⁴⁹ Batur 2017, 219.

¹⁵⁰ Szczepanowska 2015, 310; 302, Fig. 105:10; see also Morgan 1976, 104.

¹⁵¹ Krukowska 2016, 212-213. Their meanings were not further clarified by the author. Based on the artefact from the Wisłoujście fortress, the identification of the first sign and linking it to the operations of the Gdańsk merchant Keiler seems to be the correct explanation.

¹⁵² Wilgocka 2016, 228, 239, Fig. 6:5. Information on that subject can be found, for instance, in press advertisements from the years 1820 and 1823, Humbsch 1999.

¹⁵³ Wilgocka 2016, 228, 238, Fig. 5:16.

¹⁵⁴ Majewski 2017, 103-104.

¹⁵⁵ Kwiatkowski 2010, 103.

¹⁵⁶ Kufel 2018, 181.

¹⁵⁷ Kufel 2018, 182; see also Morgan 1976, 104.

¹⁵⁸ Paduch et al. 2009-2016, „Szklane pieczęcie firmy Mampe”, glass seal on the right.

¹⁵⁹ Gołębiowski 1997, 199-200, Fig. 4:i. The author suggested that was the name of a local entrepreneur – Ferdynand Schichau (1814-1896). He carried out wide ranging business operations, in particular the production of steam engines. He owned a factory of steam locomotive, a shipyard, and a ship company, see Dutkiewicz 2015.

¹⁶⁰ An undated specimen, which was not described in the publication, recorded in the form of a photograph, Garas and Karwowska 2013, 278, Fig. 9.

Fig. 4:g, j, k, o), for instance, dates: 1712, 1764, 1772 from Stargard, referring to the year of the production of bottles or – as in the first case – possibly the year of the establishment of the pharmacy, for which they were manufactured.¹⁶¹ The year 1764 impressed on the seals from the Lotzen (Łośno) glass workshop;¹⁶² 1758 and 1785 – appearing on seals from the Annenwalde glass workshop discovered in Szczecin;¹⁶³ 1744, 1749, 1750, 1754 and 1766 – on the bottles from the Marienwalde glass workshop;¹⁶⁴ and the year 1789 – on the specimens from Darłowo,¹⁶⁵ Fordon and probably from Łabiszyn, produced in the glass work in Lippusch,¹⁶⁶ as well as dates 1805 and 1811 – on the artefacts discovered in Stargard,¹⁶⁷ Elbląg¹⁶⁸ and Fordon,¹⁶⁹ from the Pipstock or Mehrenthin glass workshops. In the group of analysed finds the youngest date – 1894 is impressed on the above-mentioned specimen found in Elbląg (Fig. 6:d).¹⁷⁰

Images, geometric symbols, floral and zoomorphic representations, being iconographic symbols, and constituting the main motif on the seal, were recorded only in a few individual cases. For instance, these include a ship – a three-masted vessel with lowered (folded) sails, with diagonal rigging (also referred to as Latin), which was popular in the Mediterranean, on one find from Gdańsk (Fig. 7:p);¹⁷¹ a schematic crown, being the symbol of the monarchical power, on a seal from Fordon (Fig. 7:q);¹⁷² an isosceles triangle on the artefact from Ostrów Tumski in Wrocław;¹⁷³ the Star of David on the artefact from Poznań,¹⁷⁴ also with an inscribed letter “W” and a fish facing left underneath it, on the specimen discovered in Toruń (Fig. 7:r).¹⁷⁵ The hexagram and the fish are common symbols characteristic for Judaism, which were placed, e.g. on Jewish ritual vessels.¹⁷⁶ It is assumed that

they were impressed on glass products by Jewish manufacturers and/or intended for Jewish customers. However, it is also possible that simultaneously this also served as a confirmation that the liquid stored in such a container was kosher.¹⁷⁷

Other pictograms include a bunch of grapes on the seal from Elbląg (Fig. 7:s)¹⁷⁸ – a symbol of abundance, a popular motif used at that time for decoration of numerous goods (e.g. modern stove tiles); and the representation of an eagle with spread wings – the emblem of the Kingdom of Prussia, known for instance from seals discovered in Bydgoszcz¹⁷⁹ and Gniewkowo.¹⁸⁰ However, signs in the form of a six-pointed star, grapes, and the Prussian eagle are usually only graphic additions to inscriptions.¹⁸¹

Published glass seals from the territory of Poland sporadically have heraldic signs on them, in the form of standalone marks or grouped with inscriptions. We know only a few such signs, including several from Stargard, of which one remains unidentified,¹⁸² and three are coats of arms of the Principality of Waldeck and Pyrmont (2 specimens) and the Pyrmont region (1 specimen). The latter were accompanied by the name of spring water – Pyrmont Water and Pyrmont Stahlwasser (Fig. 6:a-b),¹⁸³ transported in bottles bearing the above-mentioned signs. At the same time, a glass seal discovered in Elbląg shows the view of the Mill Gate (*Mühlentor* in German) in Stargard, one of the four gates of that medieval town and important local monument (Fig. 6:d).¹⁸⁴

Among the recorded finds, a relatively high percentage and territorial range characterises vessels with seals bearing the name “London” (Fig. 8). According to the division created by A. Gołębiewski, they can also be classified as descriptive signs. They represent various forms – there are specimens with inscriptions in the full form (“LONDON”), as well as with abbreviations or misspelled, but always written in capital letters. Usually, the seal contains a crown above

¹⁶¹ Kwiatkowski 2010, 103-104. Another item from Stargard with date probably 1772, see Majewski 2017, 103-104.

¹⁶² Burdziej et al. 2014, 380, Fig. 11:4; Szeremeta 2018, 390, 392, Fig. 5:4.

¹⁶³ Cnotliwy 2014, 278.

¹⁶⁴ Stolpiak and Świercz 1997, 44-45; Woźny 2001, 246, Fig. 1:5; 249; Burdziej et al. 2013, 349; Burdziej et al. 2014, 389, Fig. 19:7; Bucka et al. 2015, 488, 491, Fig. 17:3; Bucka et al. 2017, 224, 238, Fig. 28:2.

¹⁶⁵ Kuczowski 2016, 162, no. 1.3.

¹⁶⁶ Siwiak 2007a, unpag.

¹⁶⁷ Burdziej et al. 2013, 354.

¹⁶⁸ Gołębiewski 1997, 195.

¹⁶⁹ Woźny 2001, 247, Fig. 2:2; 250-251.

¹⁷⁰ Gołębiewski 1997, 199-200, Fig. 4:i.

¹⁷¹ Krukowska 2007a, 434, Fig. 6.

¹⁷² Siwiak 2003, 60-61, Fig. 1:1.

¹⁷³ Siemianowska 2015, 224, Fig. 10:h; 228, Fig. 14:e.

¹⁷⁴ Kufel 2018, 181.

¹⁷⁵ Nawracki 1999, 88-89, Fig. 12:b.

¹⁷⁶ See Piątkowska and Żebrowski 2008-2020; Sieramska 2008-2020.

¹⁷⁷ Another seal that may be associated with Jewish symbols can be the artefact with the inscription in capital letters “ARIEL”, which is the only element placed on the seal attached to the bottle discovered in Stargard (Burdziej et al. 2013, 352, 379, Fig. 32). Ariel is a Hebrew man's name or a poetic name for Jerusalem (Żebrowski 2008-2020).

¹⁷⁸ Gołębiewski 1997, 197-198, Fig. 3:a.

¹⁷⁹ Siwiak 2007a, Fig. 7:4, 6, 8, 12.

¹⁸⁰ Sulowska-Tuszyńska 2018, 123; 195, Fig. 93:c.

¹⁸¹ See examples in Gołębiewski 1997.

¹⁸² Burdziej et al. 2013, 354, 384, Fig. 39. That coat of arms was not identified in the source publication. The author also was not able to identify it on the basis of the printed photograph.

¹⁸³ Wojciechowska 2015, 186-187, 199, Fig. 9:1-2. For more information on the form of such inscriptions see page 11.

¹⁸⁴ See Paduch et al. 2009-2016.

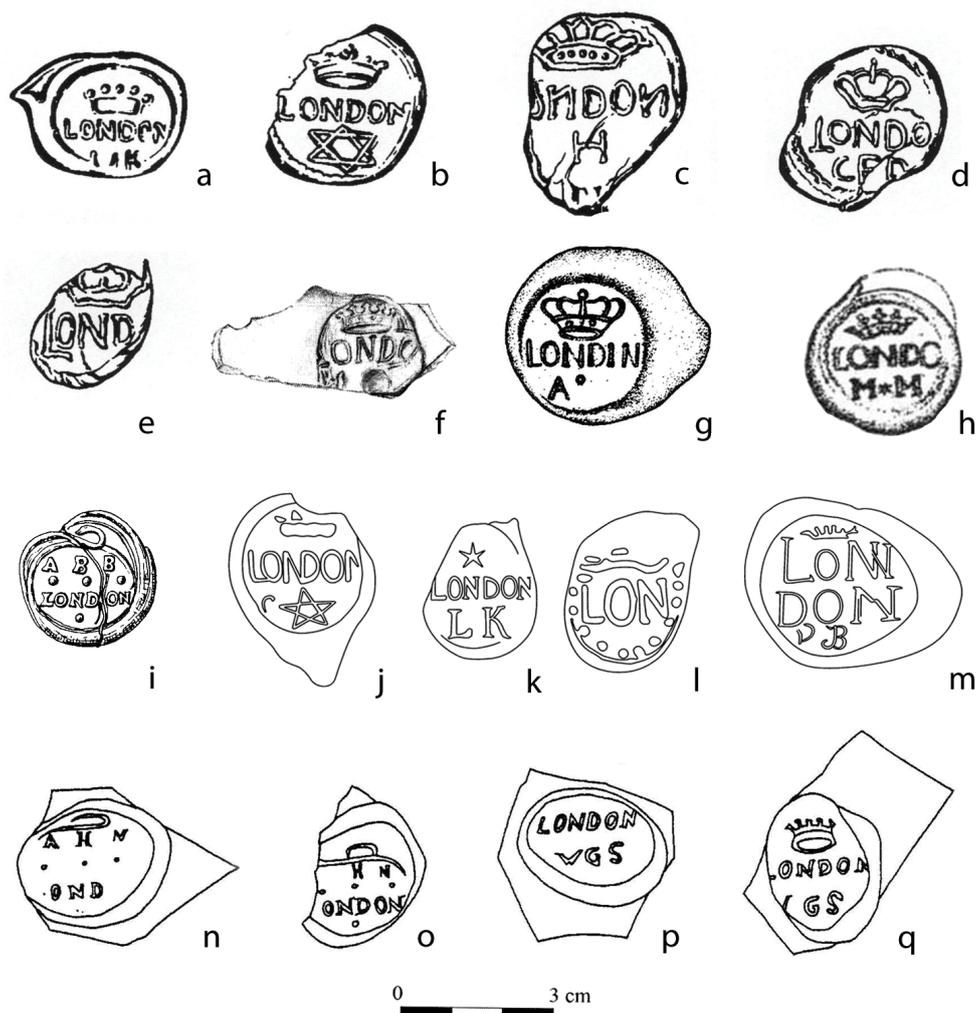


Fig. 8. Examples of glass seals with signs with the word “London” in different spelling variations from the 17th-19th century discovered in Poland: a-e – finds from Elbląg. After Gołębiowski 1997, 189, Fig. 1:a-b, e-f, h; f – find from Poznań. After Antowska-Gorączniak 2012, 194, Pl. 6:2; g-h – finds from Gdańsk. After Krukowska 2007a, 434, Fig. 5; Krukowska 2016, 213, Fig. 4:d; i – find from Toruń. After Nawracki 1999, 93, Fig. 15:a; j-m – finds from Warsaw. After Baturó 2017, 235, Pl. 5:12-13, 26-27; n-q – finds from Fordon. After Woźny 2001, 246, Fig. 1:1-4.

the text and a five-pointed star below it (Fig. 8:b, j), with various additional monograms (e.g. AC, AHB, AHN, CFD, DG, H, HN, IDB, iG, MM, PG, RG, WPS), although in the case of some sites archaeologists recorded also other forms. For instance, we know the following versions: “LONDON”, “[L]ONDEN”, “LON DON” on artefacts from Warsaw (Fig. 8:j-m);¹⁸⁵ “LONDEN”, “LOND”, “ONDO”, “ONDN” discovered in Elbląg (Fig. 8:a-e);¹⁸⁶ “LONDON”, “LONDN”, “LONDEN” on specimens from Chojnice;¹⁸⁷ “LONDIN” – in Gdańsk (Fig. 8:g);¹⁸⁸ “LONDON”, “ONDEN” on seals

discovered in Toruń (Fig. 8:i);¹⁸⁹ “ONDO”, “ONDE” – in Poznań (Fig. 8:f);¹⁹⁰ “OND” and “ONDON” – on seals from Fordon (Fig. 8:n-q).¹⁹¹ The name spelled as “LONDO” impressed on artefacts from excavations in Średnia Huta,¹⁹² Gdańsk (Fig. 8:h),¹⁹³ Poznań,¹⁹⁴ Radom,¹⁹⁵ and Witów,¹⁹⁶ as well as the item found in Chełmno.¹⁹⁷ The full mark “LONDON” is impressed

¹⁸⁹ Rubnikowicz 1989b, 77, Pl. II:1; Nawracki 1999, 92-93, Fig. 15:a-b.

¹⁹⁰ Kufel 2018, 181.

¹⁹¹ Woźny 2001, 246, Fig. 1:1, 3; 248.

¹⁹² Rubnikowicz 1989a, 52-53, Pl. I:7-8.

¹⁹³ Krukowska 2007b, 36-37, Fig. 1; Szczepanowska 2013, 285.

¹⁹⁴ Antowska-Gorączniak 2012, 151.

¹⁹⁵ Lechowicz 2012, 124, [Fig.] 108.

¹⁹⁶ Andrzejewski and Kajzer 2001, 334.

¹⁹⁷ Olczak 1991, 78-79, Fig. 5:a.

¹⁸⁵ Baturó 2017, 220-223; name „LONDEN” – also on the seal from Warsaw town hall, Blusiewicz 2013, 88-90, Pl. II:8.

¹⁸⁶ Gołębiowski 1997, 188-190, Fig. 1.

¹⁸⁷ Garas and Trzeciński 2010, 38.

¹⁸⁸ Krukowska 2016, 213, Fig. 4:d.

also on finds from Biskupice,¹⁹⁸ Dubno,¹⁹⁹ Fordon,²⁰⁰ Gdańsk,²⁰¹ Poznań,²⁰² Puck,²⁰³ and Radoszyce.²⁰⁴

The provenance and function of those bottles have been discussed many times in Polish publications. It is assumed that they were products imported from England together with their contents (mostly beer) or without it, or they were locally produced goods. The latter interpretation seems to be equally probable, as evidenced by the artefacts containing typos in the word London. In such cases, signs on the seals were supposed to increase the commercial value of the labelled goods;²⁰⁵ emphasizing the provenance of the foreign beverage imported in barrels and sold in bottles manufactured in the country of the importer. This option (Polish origin of the glass) was already confirmed as a result of physicochemical analysis of such finds from the area of the post-medieval glass workshop in Średnia Huta.²⁰⁶ We could also look at this practice from another point of view – possibly as an indented falsification of the country of origin of the vessel and the liquid it contained. How such products were distributed is also interesting. Currently, as indicated by the above-mentioned examples, we know at least a dozen or so towns and villages, in which such finds, have been recorded.²⁰⁷ Generally, they are located in different parts of Poland – from Radom to Puck, from Dubno to Poznań. A concentration of such finds can be observed in the central, longitudinal part of the country, from the south – Lesser Poland, through Mazovia and Kuyavia to the north – to Gdańsk Pomerania. Perhaps this phenomenon is associated with the ways of distribution (the Vistula route) or the cumulation of domestic production centres – both explanations are probable.

An interesting problem, which so far has been discussed only sporadically in Polish archaeological publications, is the use of glass bottles with seals for the

distribution of mineral water in the late modern period.²⁰⁸ Water from popular springs, which were believed to have healing properties, was distributed in branded containers since the end of the 17th century. In such cases, seals also confirmed the origin and the reputation of the beverage stored in the bottles. Four finds from Stargard give us the basis to state that glass containers with seals were used to import spring water from Bad Pyrmont in Lower Saxony²⁰⁹ and from Szczawno Zdrój in Silesia²¹⁰ (Fig. 6:a-c).

Archaeologists sometimes also record glass seals only in the form of blank discs attached to walls of glass vessels but without any imprints. Such finds, for instance, were discovered in Bąkowa Góra,²¹¹ in Elbląg;²¹² in Fordon;²¹³ in Gdańsk;²¹⁴ in Łabiszyn;²¹⁵ in Toruń;²¹⁶ and in Warsaw,²¹⁷ as well as in Wilanów.²¹⁸ Usually archaeologists record several such finds on a given site, but their percentage compared with the total number of glass seals is rather high, ranging between 13.5% and 37.5%. The exception is the latter find – a single specimen discovered at that archaeological site. We also know artefacts with illegible or fuzzy signs, recorded, for instance, in Trzemeszno (several specimens),²¹⁹ Warsaw (2 items)²²⁰ or Chełmno (1 item)²²¹ (other examples see Fig. 2:a-b). These are, however, atypical specimens, the genesis of which has no easy explanation. It is possible that

²⁰⁸ These matters were discussed by Iwona Wojciechowska in her paper on the consumption of mineral waters in modern Stargard (Wojciechowska 2015). For information on the potential of such studies and the possibility of identifying finds see, for instance, Brinkmann 2019; Brinkmann 2020.

²⁰⁹ Wojciechowska 2015, 186-187, 199, Fig. 9:1-2. Those are seals with coats of arms of the Principality of Waldeck and Pyrmont (2 specimens) and the Pyrmont region (1 specimen).

²¹⁰ Wojciechowska 2015, 187-188, 199, Fig. 9:3. It is one specimen with the inscription: "SALZBRUN" and "No 1". A similar find comes from, e.g. Stralsund (see Brinkmann 2020, 8).

²¹¹ 3 specimens for the total number of 8 finds, Głosek 1998, 44; 73, Pl. XI:11, 12; 108, Pl. XLIV:1, 2.

²¹² 8 specimens in the total number of 37 glass vessels discovered at that site, Gołębiowski 1997, 188.

²¹³ 1 find in the total number of 3 seals found at the site, Siwiak 2003, 60, Fig. 1:3.

²¹⁴ 1 find in the total number of 5 discovered vessels, Szczepanowska 2013, 285.

²¹⁵ 1 find in the total number of 5 finds, Siwiak 2007a, unpag.

²¹⁶ 2 items in the total number of 7 finds, Nawracki 1999, 88-89, Fig. 12:c; 92-93, Fig. 15:c.

²¹⁷ 7 items recorded by K. Baturo, in the total number of 59 seals from Plac Zamkowy (Baturo 2017, 217).

²¹⁸ The only find at that site, Andrzejewska et al. 2002-2003, 300.

²¹⁹ Wiewióra 2000, 201.

²²⁰ Baturo 2017, 217.

²²¹ Olczak 2001, 78-79.

¹⁹⁸ Ruszkowska 2007, 148, Fig. 3:6, 149-150.

¹⁹⁹ Garas and Karwowska 2013, 266.

²⁰⁰ Woźny 2001, 246, Fig. 1:2, 4; 248.

²⁰¹ Szczepanowska 2013, 285; Szczepanowska 2015, 304, Fig. 106:3; 310.

²⁰² Wawrzyniak 2000, 74, Fig. 17.

²⁰³ Starski 2015, 160-163, Fig. 141:1.

²⁰⁴ Kajzer 1988, 143.

²⁰⁵ See Gołębiowski 1997, 191. For other interpretations see e.g. Woźny 2001, 248-249; Szczepanowska 2013, 285-296; Baturo and Kasprzak 2018d, 34, footnote 1.

²⁰⁶ Rubnikowicz 1989a, 61-62.

²⁰⁷ In his work from 1981, Leszek Kajzer recorded in Poland only five sites with these types of finds: Frombork (currently Warmińsko-Mazurskie Voivodeship), Piotrków Trybunalski (currently Łódzkie Voivodeship), Raciążek (Kujawsko-Pomorskie Voivodeship), Ujazd (Świętokrzyskie Voivodeship), Zakrzew (Łódzkie Voivodeship), Kajzer 1981, 171, Fig. 7. Since that time that number has greatly increased.

they are examples of flawed seals, the result of an oversight or mistakes made during the production process, for instance as a result of a shoddy application of the glass disc and impressing the stamp in still too molten glass. Perhaps they are the evidence of abandoned orders placed for signed vessels, which despite the withdrawal of the specific commission were sold to another customer. We cannot rule out, however, that it was a deliberate action aimed at hiding the scale of production from the tax authorities, or at least understating it. Smooth surfaces of glass discs may also be a secondary effect, a result of removing (grinding down) the existing imprint.²²²

Conclusions

Based on the literature concerning this subject and archaeological sources, it is possible to state that finds from the territory of Poland correspond with the general tendencies in terms of the quality, form, and function of this type of artefacts described by foreign scholars, whereas their specific feature (as far as it was possible to establish on the basis of published materials) is the more slender shape of vessels with seals – a greater proportion of cylindrical bottles than squat ones (of the *shaft and globe*, *onion bottle* and *mallet bottle* types). This is associated with the chronology of Polish finds, which are primarily vessels from the 18th and 19th centuries, when the slenderer forms gradually became the most popular type of manufactured glass bottles. The square-bodied bottles kept in cases (*case bottles*) more often are containers with seals bearing the name “London”. This results from the fact that their large part constituted goods imported from England, and their domestic imitations repeated the form of the original bottles. Bottles with the name of the English capital city with the correct spelling or in a modified (also misspelled) are discovered relatively often in different parts of Poland. Their use may be seen as a deliberate marketing practice at that time. Placing a word or expression directly related to England on the seal suggested to the customers that the product was an original import from that country, even if it actually had a domestic or different provenance (for example Dutch).

Artefacts from the territory of contemporary Poland are characterised by a limited and schematic set of signs placed on the seals, and the quality of imprints is usually not very good. This is manifested through rare occurrence of dates (just on several specimens from Bierzwnik, Darłowo, Elbląg, Łomża, Pipstock, Stargard and Szczecin.), full surnames (two identified finds from Gdańsk associated with the merchant named

Johann Keiler and one with the owner of the Szczecin brewery Bergemann), and complete names of glass workshops (among other things, *Piekarska*, *Olichawska*, *Sztabska*, *Glas Fabrik Clementienhof*). The latter are usually identified based on place names written on seals – locations of the glasshouses (*Bernsee* – Breń, *Blendow* – Błędów, *Dantzig* – Gdańsk, *Lippusch* – Lipusz, *Lotzen* – Łośno, *Marienwalde* – Bierzwnik, *Racado[w]* – Racendów, etc.). Seals bearing only emblems: a ship, crown, triangle, the Star of David, a bunch of grapes, eagle, as well as coats of arms are rare. The majority of the discovered heraldic stamps are related with containers for spring water. Only some of the Polish finds can probably be considered as products made to order of definite breweries, liqueur factories or alcohol distilleries (with inscriptions “BERGEMANN ERBEN”, “CGS”, “HARTWIG”, “I JO KEILER”, “J.J. KEILER”, “GESETZ z. SCH[UTZ d. WAARENBEZ.]”).

The largest group comprises seals with inscriptions that are probably abbreviations or initials, which today are impossible to decipher, but – as we may assume – were usually trademarks.

This can be attributed to the still limited knowledge about manufacturers and buyers of modern bottles in Poland, primarily due to the insufficient recognition of written records. The exemptions are already published results on studies on glass workshops and finds of glass seals from western part of Poland as well as the recently carried out and disseminated research concerning such workshops and finds from Mazovia. For this reason, in the case of many artefacts from territory of Poland we are usually unable to establish the cause and circumstances associated with placing orders for vessels stamped with specific seals. Furthermore, there is no evidence of an occasional production of signed wares similar to those recorded abroad.²²³ Also because of the small number of finds, so far it has not been possible to undertake other analyses on their basis, including those concerning ownership aspects (changing leases of glass workshops or commercial counterparts). That problem will persist until we see progress in studies on various types of historical sources and issues concerning the history of Polish glass making and use of glass vessels, and in particular in relation to other regions of Poland – although the identification of people and places hidden behind enigmatic signs may still not be possible.

In my opinion, the greatest potential lies in the research into the range of products manufactured in the so-called forest glass works, namely main producers of storage bottles, and orders for glass containers that were placed with them. Furthermore, another very important

²²² See Gołębiowski 1997, 199; Mucha 1997, 118; Siwiak 2003, 61; Siwiak 2007a, unpag.

²²³ E.g. associated with private important occasions or events, see Morgan 1976, 11; Jeffries and Major 2015, 151.

research topic may be details of commercial correspondence from the 17th-19th centuries regarding the organisation and supply of manors, purchasing beverages and ways of storing them in such estates, and the functioning of breweries, wineries, distilleries, and inns, as well as merchants trading in alcoholic beverages or spring water. Studies concentrating on the history of individual glass workshops and enterprises associated with this sector of economy may also provide valuable data on this subject. Such information may give us a better idea about the scale of production of the analysed wares, conditions, and places in which purchases were made, their frequency, quantities, and costs.

Furthermore, glass seals, particularly identified seals with proven chronology, can be good sources for

archaeological dating, and thus help us with the analysis of stratigraphy and establishing the time of use of other finds from the same assemblages or deposits. Additionally, as demonstrated by the above-mentioned findings, they can be very good sources for studying selected aspects of the history of glassmaking in Poland, being the evidence of the functioning of individual glass workshops – particularly those less known – and the assortment of their products.

Without a doubt, Polish publications released to date provide valuable material for comparative studies, increasing our knowledge about types of marks that were used, their territorial diversification, and chronology, and observations compiled by me in this paper will hopefully become a starting point for further detailed analyses.

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