

LATE MEDIEVAL GLASS IN SILESIA

SUMMARY

Medieval glass-making in Silesia has been studied to a rather limited extent. No regular investigation of glass production sites was made, whereas the material evidence available for analysis originating from medieval pre-urban and urban sites investigated at i.e. Niemcza, Opole, Wrocław was published only in very general reports from excavations. Where the quantity of glass finds was more substantial, the material was examined in a number of publications, e.g. on vessels from Bardo and Gniewoszów (Frankce, 1993, pp. 339-366; 1994, pp. 95-112), Legnica (Firszt 1994, pp. 23-42), Nysa (Krawczyk, Romiński 1999, pp. 133-159), some finds from Głogów – (Czapla 1997, pp. 245) and Wrocław (Płonka, Wiśniewski 1990, pp. 423-434; Nowosielska 1998, pp. 241-261; Kaźmierczyk 1993). The as yet relatively modest number of analyses, on the one hand, and a steadily growing corpus of glass finds on the other, prompted the author to take up the subject of late medieval glass-making in Silesia in a four-years' study based on analysis of evidence of glass production and the complete set of late medieval glasswares recorded in the region.

The research method adopted in the present study had been developed by Maria Dekówna. In it material evidence is classified using a system based on technological and formal features. In harmony with the process of glass-making, first, investigation was made of the chemical properties of the glass material, its degree of transparency and colour, followed by an analysis of manufacturing technique and,

finally, of the form and ornamentation of the finished vessels. All throughout, reference was made to the chronology of the finds (Dekówna 1980, pp. 32-34).

The geographical range of our study is the province of Silesia, within its earliest (medieval) political borders. At that time, state borders largely followed the natural boundaries of the land, such as rivers and mountain ranges. For this reason, research was extended also to the area of the Kłodzko Basin, Krosno Odrzańskie and Zielona Góra even though they no longer are a part of Silesia.

Chronologically, the study is concerned with the period starting from the second half of the 13th until the 15/16th century. The lower boundary is defined by the earliest finds of late medieval glass vessels as well as the most likely time of emergence of glass-making in Silesia. The discussion is preceded by a brief account of early medieval glass-making in the region given to present the background on which late medieval production developed. The upper chronological boundary is determined by the horizon of glasswares still considered as late medieval and coincides as well with the period of an evident standstill in glass production, caused by Hussite wars which brought considerable devastation and depopulation to regions actively involved in glass production.

The study is divided into two sections – Part One, containing an account of the development of the glass industry in Silesia, and Part Two, presenting the analysis of the late medieval Silesian glassware.

PART ONE – ORIGINS OF GLASS-MAKING IN SILESIA

The first glasshouses are known from pre-urban sites such as Obiszów (Pokora, Rzeźnik 1998, pp. 321-333), Niemcza Śląska (Kaźmierczyk 1968, pp. 240-242), Ostrówek (now a district of Opole) (Hołubowicz 1953, pp. 19-53; 1956; 1957, pp. 204-224; 1960, pp. 54-66; 1962, pp. 270-295), Nowy Targ (Kaźmierczyk 1970) and Ostrów Tumski (Cathedral Island) in Wrocław (Kaźmierczyk, Kramarek, Laso-

ta, report 1974-1979; Ostrowska 1959a, pp. 144-158; 1959b, pp. 91; 1961, pp. 69-69). Evidence on the first primitive glass-making activity is quite modest, represented by production waste such as vitreous slag and failed glass items; half-finished glass items; raw material, in the form of lumps of melted glass and quartz; fragments of production vessels retaining traces of a glassy substance; finally, finished pieces,

represented during the early medieval period chiefly by jewellery – beads – and later, also by glass rings and bracelets, the latter much less frequent. Glass production at Ostrówek-Opole is documented by finds of glazed ceramic vessels, produced from comparable raw material as unglazed ceramic vessels discovered at the site, fired using a similar technique and bearing the same potter's mark. The few finds of glass production are represented by the remains of two hearths and a furnace from Cathedral Island, Wrocław, which the investigators connect to glass-making. However this interpretation lacks support from direct evidence, such as vitreous slag or glass material.

The only glass-making site investigated comprehensively by excavation – Cicha Dolina near Piechowice – yielded the remains of four glass-making furnaces. Three of these features have been interpreted as production furnaces, basing on the presence of numerous globules of melted glass; the fourth appears to be an annealing furnace, as suggested by finds of fragmented glasswares and a smaller quantity of glass globules discovered nearby. Other evidence on glass-making included production tools, production waste and fragments of finished products. In 1990s the site at Cicha Dolina was revisited, its chronology determined as late 13th – mid-14th c. It is thought at present that the furnace to be worked also in the 15th c. (Gluziński 1965, pp. 9-21; 1966, pp. 245-248; Grabowski 1998b, p. 23; 2000, pp. 259-161; Firszt, Paczos 2000, pp. 222-223). Surface surveys – the only type of archaeological investigation conducted in the Kłodzko Basin – were largely unsuccessful. They only confirmed the existence of a glass-making site at Poniaków. Even so, excavations made in the region by geologists and petrographers helped identify other glass metallurgy sites. Młynowiec produced evidence on glass-making in the form of quartzite fragments of substantial compactness, possibly resulting from high temperatures; other evidence included vitreous slag, fragments of quartzite and a fragment of a crucible. All of these finds have been associated with glass production (Zagożdżon 2000, pp. 117-122).

With the archaeological record so slim, a map was made of areas potentially best suited for glass production during the late medieval period in Silesia. Late medieval glasshouses appear to have been located at different location than glassworks from the preceding period – at a greater distance from settlements, close to sources of raw material and fuel. The map shows the location of quartz and limestone deposits, also areas of woodland, beech wood in particular which provided fuel valued highly by glass-makers, and place names associated with glass-making industry: Polish – Szklary and Szklarki, German –

Glashütte, Gläsen, Gläserndorf, Gläsersdorf. A comparison was made of historical records and evidence from archaeology. The first written historical sources connected directly or indirectly with the industry date from the early 14th c. They relate to three geographic regions: in northern Silesia – the lowland around Przemków and Lubin; in the south, the Izerskie and the Karkonosze Mountains; the Kłodzko Basin (Czihak 1891, pp. 7-8; Klante 1935, pp. 111-131; Zödler 1996; Zrůbek 1998, pp. 72-88; Gluziński 1987, pp. 63-69). The only archaeological evidence available comes from investigation of the site at Cicha Dolina. A number of other locations, discovered by fieldwalking at Poniaków, Bystrzyca Kłodzka commune and Młynowiec near Stronie Śląskie, still need to be verified.

Upon examination, the location of mineral resources, placenames connected with glass-making and archaeological evidence, visibly concentrate in the southern region of the Kłodzko Basin. Places associated with glass production are situated between two areas known to harbour quartz and quartz schist deposits. Quartzite beds most likely to have been exploited are those found in the region of Lesice – Niemojów, found in the neighbourhood of Poniaków and Międzylesie, and the Międzylesie – Niemojów deposit lying between Międzylesie and Szklary. Other probable deposits include beds of quartzite and quartz reefs near Ołdrzychowice Kłodzkie, as well as beds of quartz schist in the region of Stronie Śląskie – Kletno, to the south and the east of which lies the area with the concentration of placenames associated with glass production. In the region of the Karkonosze Mountains two sites potentially associated with the industry, lying at a comfortable distance to the south-west of quartz reefs, are Szklarska Poręba and Cicha Dolina. It is remarkable that the area of sandy deposits, potentially useful in glass production, yielded no evidence on this industry. This would confirm a thesis that the glassmakers of the late Middle Ages were not familiar with the location of this resource.

Origins of glass production are connected undoubtedly with the economic revival of the mid-13th c. Judging from the political and economic relations maintained by Silesia with its neighbours we may suppose that the first glassmakers came from Bohemia, where the emergence of the first glassworks is connected with the colonisation campaign of the 13th century. The process was especially dynamic during the second half of that century when the first glassworks were probably being established. There is evidence of glassware from the second half of the 13th c., recognised as a native product and of glassworks, their age, determined on the basis of pottery

finds, to late 13th and 13/14th c. The beginnings of glass production in Bohemia have been traced to impact from the west of Europe, which in its, had been receiving impulses from the south, i.e. Italy. As such Bohemian glass-making belongs to the stylistic Central European trend of glass-making. While it is evident that Bohemian and Silesian glass industries were connected, the nature of this relationship is less clear. It is difficult to establish so far whether glassworks in Silesia originated as a result of the same colonisation campaign as in Bohemia or whether they developed independently, as a result of separate campaigns undertaken by Silesian and Bohemian overlords of obscure identity. The above questions might be resolved by carrying out a regular investigation of Silesian glass-making sites. Like in Bohemia, glasswares started to be produced locally in Silesia during the latter half of the 13th c. It is interesting that in the light of the earliest written records, glass production in Silesia developed in a region which was not under Bohemian influence.

The earliest reference, dating from 1305, concerns the location Szklary, in the region of Żąbkowice Śląskie, Otmuchów and Grodków. The rise of this glassworks may be connected with colonisation campaign carried out in this area during the 13th c. by Silesian church officials. From the same period we have a reference to another location by the same name, found in northern Silesia, in the region of Lubin and Przemków. At the present stage of investigation it appears that – with justification – Silesian lords may be considered to have encouraged the development of glass-making in their region. On the other hand, other glass-making centres, recorded in the latter half of the 14th and in 15th c. were probably connected with the activity of Bohemian lords. This is supported by the fact that during this period Silesia was under Bohemian and by a reference made in 1376 to a glass master who arrived in the region from Bohemia. The close links of Silesian and Bohemian glass industry are also evidenced by the striking similarity of glassware dating from this period.

PART TWO – THE MATERIAL

This section contains a discussion of late medieval glass finds registered in Silesia, their analysis and comparison with other Central European glassware. The material originates from excavations conducted at urban and castle sites in Silesia: Bardo, Głogów, Gniewosów, Jawor, Jelenia Góra, Legnica, Lwówek Śląski, Nysa, Środa Śląska and Wrocław. As already said, they have been published only to a small extent.

Analysis distinguished 24 vessel forms used in Silesia in the late Middle Ages. A group characterised by greatest diversity ornamentation variants and vessel morphology are beakers with prunts. Another such group are vessels decorated with threads or glass ribbons. Bottles were represented by all their types used in that period. Vessels were made in two basic techniques – the so-called “free-hand” technique and by blowing into the mould. Out of a total of 906 late medieval glass vessels only a handful survived in intact condition or are slightly damaged, the rest were substantially fragmented. The best represented vessel form is the flute beaker. Of 532 of these specimens which were identified, 222 could be classified to a specific type. In earlier studies flute beakers were considered as a typical product of Bohemian glassworks, referred to in literature, German, in particular, as “tall beakers of Bohemian type”. However, according to our analysis, flute beakers may have originated also in glassworks outside Bohemia, which formed a concentration in, broadly speaking, the Sudety Mountains area. It is possible to distinguish flute beakers produced north of the

Sudety from those produced the south of this mountain range. Conical beakers were the most frequent form in the group of analysed Silesian glasswares (168 items) but in Bohemia club beakers were visible the more popular form. This may be a reflection of a difference in local consumer demand. Another visible difference is shown by ornamentation. In Bohemian flute beakers glass threads fused between the rim and the vessel body or, alternately, all over the vessel body, are ornamented additionally by hatching, a form of decoration noted in the analysed set of Silesian glassware only at Gniewosów, where this ornament occurred on separated part of beaker rather than on flute beakers. Another form of ornamentation not seen in the material from Silesia are beakers ornamented with long applied ribs additionally decorated with fused on globules of blue glass. All these differences, while minor, indicate regional differences in production.

One form of glassware distinguished during analysis was probably produced only in Silesian glassworks: beakers with large oval prunts with a more or less separated head. Twenty two of them were registered – the largest set of these form known so far. Outside Silesia, such beakers are known only from Międzyrzecz Wielkopolski in central-western Poland, and Most in north-western Bohemia (Olczak 1957, p. 230; 1960, p. 130; 1962, p. 176; Černá 1994, p. 46; 1997, pp. 331-344). Another interesting group characteristic for Silesian glass-making are beakers with framing forms decorated with glass threads

welded onto the vessel body at specific areas. In Silesian beakers this type of ornamentation is more elaborate than in glass goblets and bottles from other areas of Europe, the threads have a more ornate arrangement of zigzags, garlands and festoons. Glass threads are either fashioned from the same glass material as the vessel body or in blue coloured glass. Four beakers of the described type were registered in the material from Silesia. They may represent a regional variant of this type of decoration. Probably, also beakers with large flat prunts with a weakly separated head and forms with applied ribs which back strongly rise upwards appear to have been a local product, not recorded outside Silesian urban sites.

Imports are represented by vessels produced from soda glass and by forms considered as typical for the output of glassworks found outside Silesia. It should be noted that identification of imported items was assisted to some extent by analyses of chemical composition, which unfortunately could be made only for some of the vessels. The analysed glasses were made of alkaline material: soda and potash glass. Soda glass, used in making the vessel finds from Silesia, belong to the group of glasswares which were produced using soda-rich plants as a source of this mineral. It should be noted that in some of these items maritime plants had been used, in other pieces – continental plants. Potash glass is represented also by two variants: potash-silica and potash-silica-lime glass. Soda glasses were commonly produced in the Mediterranean Basin and pre-Alpine Europe during antiquity and the Middle Ages. After AD 1000 there was a shift in the type of the glass material used in production. Potash glass appeared to the north of the Alps. This is connected with the spread of the glass-making industry, now cut off from its earlier sources of soda. And so, after AD 1000, potash glass became characteristic for Central Europe whereas soda glass continued to be produced on the Mediterranean as well as in southern Germany, Austria and Switzerland. It seems justified to suppose that in Poland in Silesia vessels made of colourless glass represent imports from southern areas beyond the Alpine ridge. For their part, forest glass, some of them no longer transparent at present and corroded, are products of local glassworks.

Beakers with prunts are recorded for the first time during the second half of the 13th c.; mould-blown beakers with ribs were also introduced at this time. Beakers with prunts are represented by beakers decorated with "type A" prunts and forms in which the prunts have the form of upward-facing projections. Mould-blown beakers with ribs are well represented (18 specimens). Similarly as beakers

with prunts, they appear in the second half of the 13th c. XIII and continue in evidence until the 15th c. Both types were produced in south Germany and Switzerland. A more rare variant are beakers with oblique ribs, a form known chiefly from southern Germany and Rhineland. A single specimen of this type is known from Silesia, discovered in the main square of Wrocław. Other imported forms are less frequent. *Krautstrunks*, regarded as one of the leading vessel forms turned out by late medieval German glass-makers, are recorded in Silesia during the 15th c., i.e., the same period that they were being used in Germany. Finds of classic *Krautstrunks*, made from light blue glass, are recorded only in Wrocław, Legnica and Głogów. Other probably imported forms of glassware include a beaker with vertical tapes, a beaker without ornament, a so-called *doppelkonische Flasche*, and a mould-blown bottle with ribs with welded on glass threads.

The following forms are considered by Czech scholars as products of Bohemian glasshouses: beakers with fused on ribs which have a large and flat head, mould-blown bottles with ribs – both forms discovered in number in the region also at glass-working sites. In Silesia, ten beakers of this type and nine bottles have been found. Taking into consideration the shared roots of Silesian and Bohemian glass-making, the two forms may be regarded as typical products of the Sudety Mountains glass industry. This view is supported by the striking similarity of technological features of Bohemian and Silesian finds. Alternately, the small number of these forms in Silesian material suggests they could have been imported from Bohemia. Further investigation of Silesian late medieval glass-making sites should help to resolve this issue.

Another interesting question is the structure and chronology of imported vessels: they were imported in number starting from the second half of the 13th up to the 14th c., gradually becoming less widespread during the 15th c. Initially, glassware made of soda glass of south provenance was more typical, the most common form being mould-blown beakers with prunts and with ribs. Imports dating from the 14th and the 15th c. are products of German and/or as mentioned earlier, Bohemian glassworks. The decrease in imported material may be due probably to the development of local Silesian glassworks.

Until mid-14th c. the form prevalent in the analysed material is the small beaker which is represented by several variants. Around 1350 the first flute beakers appear and gradually become the most popular form. Analysing the glass finds from Most E. Černá notes the same diversity, where during the latter half of the 14th c. flute shaped beakers are the most popular form (Černá, 1997, p. 331-344). Bottles, while rep-

resented by only a small number of finds, are nevertheless a highly varied group. This is probably due to the uses to which they were put during the Middle Ages. Some bottles served as decanters, others were used for storing liquids. Their number increases abruptly starting from the 16th c., from which time they form the best represented category of glass vessel finds.

A comparison made of late medieval glassware from Silesia and other areas of Poland has shown that vessels in the former region are both more plentiful and come in a richer variety of forms. Silesian, Bohemian and German glass-making belong to the same line of development of Central European industry. Influence of Bohemian glass-making on Silesian production cannot be refuted. The same type of raw glass, i.e. potash glass, was used in production, which is characteristic for Central European glass industry. At the same time, slight variation in tint is also noted. The vast majority of vessels discovered in urban sites in Silesia have a greenish tint, in contrast to Bohemian glassware which tends to be yellowish or yellow-green in colour. At the present stage of research it is difficult to resolve whether this is the result of intentional action i.e. a different recipe was used, or whether this is due to different composition of locally mined quartz used by Silesian and Bohemian glassmakers. A comparison of chemical analysis results obtained for Silesian and Bohemian glasswares is needed to determine this question. Vessel forms and proportions of Silesian and Bohemian glassware are visibly similar and apparently belong to the same stylistic trend, with some evidence of regional differences. Influence from German glass-making is evident and of twofold nature. First, the analysed set of glassware included imported German *Krautsrunks* and the so-called *doppelkonische Flasche*; secondly, German glass industry provided the first impulses for the development of both the Silesian and the Bohemian glass-making. Impact from south European glass-making is evidenced by 13th c. imports, represented by beakers made from soda glass, e.g., beakers with prunts.

The next issue is the role of glass vessels in the daily life of the medieval people. The users of glassware may be identified by comparing evidence from sites with a known social topography such as e.g. Wrocław (Goliński 1997) and Świdnica, but only the former produced finds of glassware. As could be expected, glass vessel finds clustered in the better-off districts of Wrocław, therefore we may assume that they were used by members of the town oligarchy and the upper middle classes. The conclusions made for Wrocław may be compared against findings from other Silesian towns with known finds of late medieval glassware. Everywhere glass vessels occurred in

the central area of the town, close to the medieval town square, i.e. areas inhabited by the upper ranks of the urban population.

The final issue addressed in connection with the function of late medieval glassware is what beverages they held. Iconographic sources (Wąsowicz 1967; Legenda... 1993, pp. 17-18; Karłowska-Kamzowa 1976, fig. 115; Ziomecka 1986, fig. 5) indicate that the vessels of interest were items of tableware. It is less easy to identify the beverages they held. Assuming that vessel size has a diagnostic value it would appear that the largest glass containers, such as flute-shaped beakers, were used for beer and smaller beakers, for wine. This view is supported by what we know of medieval drinking habits, when beer was the most common drink. According to estimates the average daily consumption of beer in Silesia was two litres. With only a handful of flute beakers intact, it was possible to estimate the approximate capacity of these vessels. In most cases it ranged from about a litre, i.e., a quart – unit of measurement used in the beer trade. Bottles were probably used both for drinking and storage. Their small number in the examined set suggests that they were less popular than beakers and were used for storage only to a limited extent. We may imagine that during the period of interest bottles were more likely to have been used as decanters rather than as containers in our understanding.

The study contains a review of the current state of research on medieval glass-making in Silesia and presents a possibly comprehensive source basis in the form of glass vessels, obtained in the course of a four year's study, complete with its classification against the background of Central European glasswares.

The review of Silesian vessel finds shows that they belong to a style generally widespread in Central European glass-making, represented in literature until recently by Bohemian and German wares. In their technology and style they do not diverge from vessels discovered in Bohemian towns. The resemblance is so pronounced that seems justifiable to depart from the definition of Bohemian and Silesian glasswares, in favour of a more general term such as "the Sudety glass industry". This does not mean however that glasses produced on either side of the Sudety are an entirely uniform group as they also show a number of differences, which may be described as regional.

In the course of work it became apparent that excavation work of glass-working sites is urgently needed. The results of such investigations could be helpful for gaining a better understanding e.g. of the origins of glass-making in Silesia or of the spread of individual vessel types across Central Europe.