Studies in Post-Medieval Archaeology

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Material culture from the end of the 15th century and its reflection in archaeological, written and iconographic sources

Hmotná kultura od konce 15. století a její odraz v archeologických, písemných a ikonografických pramenech

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House of the armoury scribe at Prague Castle

Dům zbrojního písaře na Pražském hradě

Das Haus des Waffenschreibers auf der Prager Burg

Gabriela Blažková-Dubská

Im Rahmen der Rettungsgrabung auf dem Georgplatz auf der Prager Burg wurden 1987 verschüttete Kellerräume mit neuzeitlichen Funden entdeckt. Bei der Analyse der Befunde ist es gelungen, diese Keller dem Haus des Waffenschreibers zuzuweisen. Die vorliegende Studie stellt die erste komplette Veröffentlichung dieses neuzeitlichen Befundes dar, einschließlich Keramik, Kacheln, Glas, der Knochenfunde und Kleingegenstände, der etwa auf die zweite Hälfte des 16. und an den Anfang des 17. Jahrhunderts entfällt.

1. Introduction

The planned reconstruction of Jiřské náměstí (Jiřské Square) at Prague Castle in 1984-1989 included an archaeological rescue excavation. The fourth excavation season took place in 1987 in the eastern part of the square, headed by I. Boháčová, J. Frolík, and J. Žegklitz. A total area of 170 m^2 was excavated. The eastern side of the excavation area bordered the parallel facade of St. George's Basilica, and one-third of the western side was directly connected with an excavation from 1984. The archaeological excavation uncovered numerous features from the Early Mediaeval through to the Early Modern periods.

Note 1:
For a detailed description of the archaeological situation, see *Dubská 2001*; *Dubská 2002*.

The Early Modern archaeological situation was mentioned by authors of a preliminary publication on the excavation (*Boháčová – Frolík – Žegklitz 1989*). The Early Modern period was the subject of a dissertation that not only evaluated the field context but also elaborated its individual finds (*Dubská 2002*).

Fig. 1. View of the area of the archaeological rescue excavation on Jiřské Square at Prague Castle in 1987.
Obr. 1. Celkový pohled na plochu záchranného archeologického výzkumu Jiřského náměstí na Pražském hradě v roce 1987.

2. Field context[1)]

Within the excavated area two filled cellar spaces of unequal size were uncovered, bordered with mortared arenaceous marl walls, originally vaulted with a barrel vault (*fig. 1*). The larger cellar was 3.6 x 4.1 m in size and the smaller one was 3.8 x 1.5 m. Both cellars were initially connected through a doorway, the sill of which survived, along with the late Gothic door jamb. The top part of the arch stone of the entrance portal was not found. Only part of the arch's haunch remained preserved, found at the base of the fill. The original portal appears therefore to have been partially disassembled even

Fig. 2. A detailed view, from the north, of the late Gothic portal between the cellars. In the background is the entrance to the Noblewomen's Home.
Obr. 2. Detailní pohled od severu na pozdně gotický portál, umístěný mezi sklepy. V pozadí vstup do Ústavu šlechtičen.

before the cellars were filled. Looking southward, from the area of the large cellar towards the small one, there is clear evidence of rough-hewing of sandstone blocks of the two vertical columns of the portal (*fig. 2*). This gives rise to the speculation that it may have been set secondarily, and the fact that the portal is located between the cellars seems to support this.

2.1 The smaller cellar

Two vaulted-arch niches of dissimilar size were found in the north and east walls of the smaller cellar. In the case of the north wall, it was a 1.18 m long and 0.88 m high meticulously walled niche, which does not exceed the thickness of the wall (contexts 679, 682, 683, 688, 691A). The entire situation was subsequently covered by a fallen ceiling (layer 807). The niche in the east wall was substantially smaller, and it was unfortunately not possible to determine its dimensions from the documentation. We only know that it was filled in with secondary destruction debris (layers 679, 724, 742, 682, 688).

The bottom of the smaller cellar was partly lined and reinforced with stones, and the remainder of it was formed out of a layer of clay that, in the original documentation, was described as the floor surface (808A – *fig. 3, 4*). Roughly in the middle of the smaller cellar a rectangular depression in this layer was detected along with the remains of wood. Above the floor there were layers with a sand-mortar type composition (768, 782, 785), rich in arenaceous marl and stone. Layers 688, 749, 690, and 691A can be joined into a single formation,

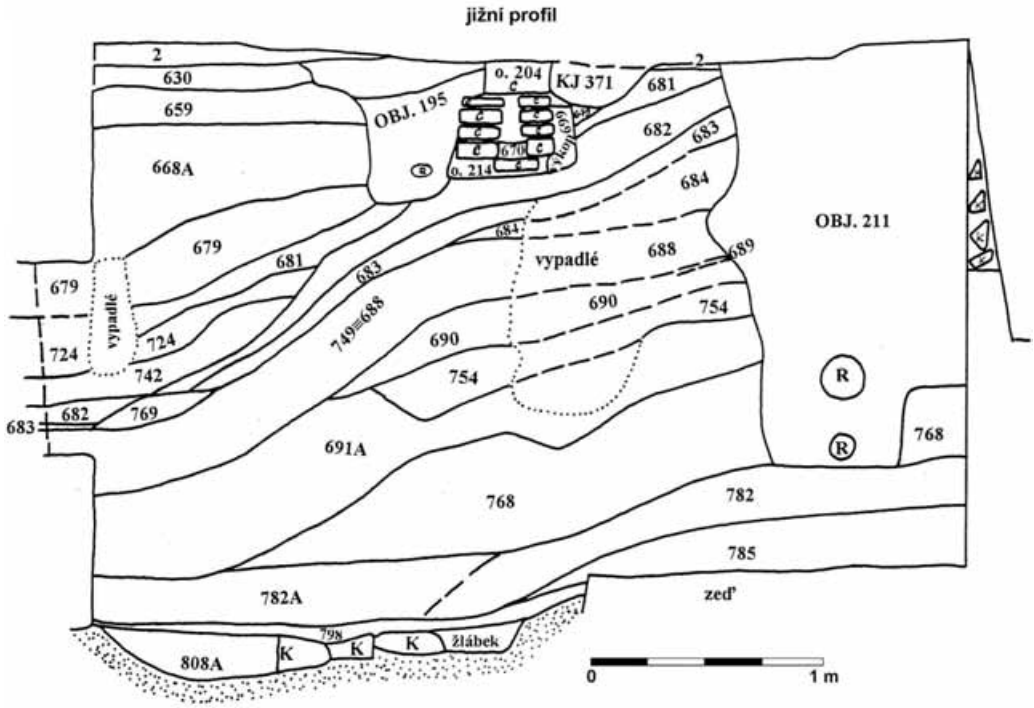
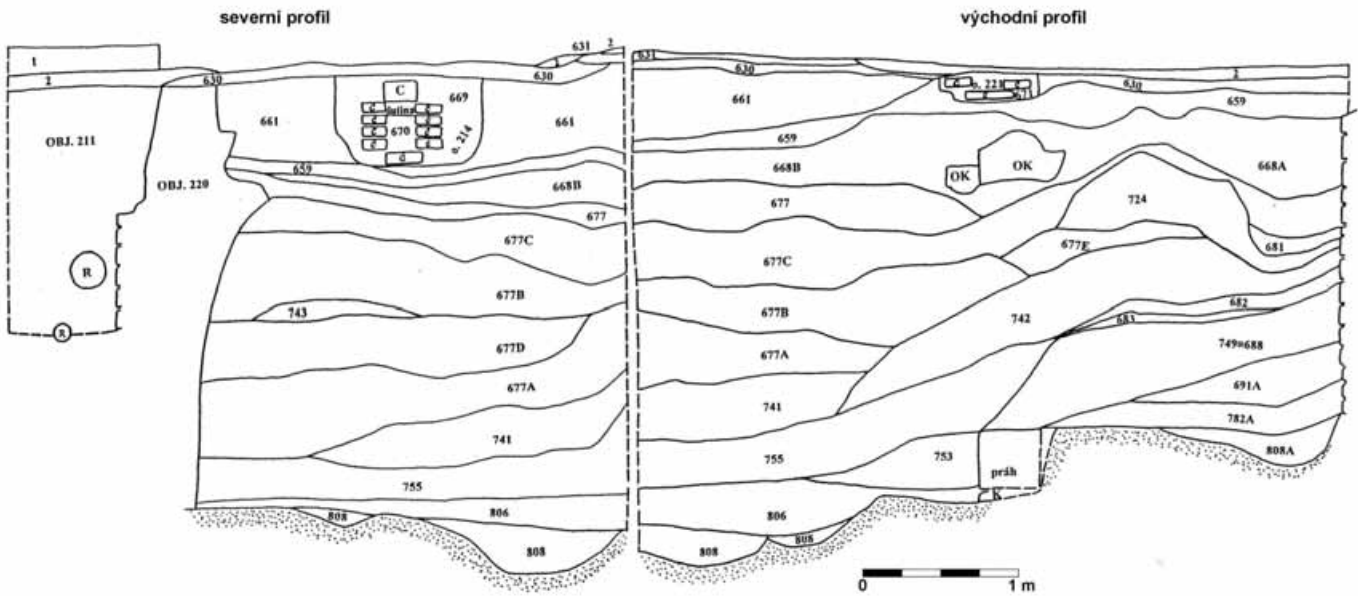


Fig. 3. The southern section through the fill of the small cellar.
Obr. 3. Jižní profil zásypu menšího sklepa.


severní profil
východní profil
OBJ. 211
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1 m

Fig. 4. The northern and eastern sections through the fill of the cellars.
Obr. 4. Severní a východní profil zásypů sklepů.

finds from which were in several cases stored under a joint inventory number. We can therefore assume that these are layers that, at first glance, are hard to distinguish between and which could only be clearly separated during subsequent documentation of the section. It is also necessary to mention layer 754, comprised of a clay fired dark brown to black, with an irregular course, wedged between layers 690 and 691A, with a considerably crushed content. This layer contained most of the tile finds[2)], which may be the source of its dark colouring. The layers richest in finds were nos. 683 and 682. The course of these layers was very slanted, gradually ending off in the area where the door once stood between the two cellars. Both layers were on average 0.24 m thick. Together they contained more than 75% of the ceramic fragments found. They can therefore be considered to have been layers of dumped rubbish. These were followed by three, not very thick, sandy layers (681, 680, 679). The first horizontally laid layer (659) can be regarded as a levelling layer. Layer 668A (sandy with stones) is the first to cover the door jamb, and it enters the area of the larger cellar as layer 668B. The course of layers 679, 680 and 681 was disturbed by more recent interference in the form of an older Baroque water main – feature no. 214 – and the existing water main – feature no. 195 (*Dubská 2001*, 8).

In the area of the smaller cellar a 2.40 metre deep well, revetted with stones, was discovered beneath layer 785. The deepest part of the well was composed of a muddy, grey, clayey layer with stones (812), just under 0.10 m thick. On top of this layer there settled a reddish-brown to brownish-red sand-clay layer with smaller stones (811) which, together with the preceding layer (812), filled part of the bottom of the well. On top of this layer, the thickest layer of the well fill, at 0.60 m, was identified, characterised as a light-grey, clayey layer with large stones and bricks, and in places mixed with the next adjacent layer 809. The following six layers, with a total thickness of 1 m, are described as brownish-red in colour and primarily clayey in character. Only minor differences were recorded in the presence of raw components. In the case of layer 802, the surface is firmly compacted.

Note 2:
Tiles were very often used to fill in larger spaces, e. g. Renaissance tiles from the vault fills of the so-called cave-chambers at Točník (*Hazlbauer 1989*, 9), the fill of the vault of the large hall at Křivoklát (*Durdík – Hazlbauer 1994*, 266), the vault fills in part of the forecastle in Kostelec nad Černými Lesy (*Durdík – Hazlbauer 1993*, 290), the vault fill on the grounds of Lobkowicz Palace at Prague Castle (*Durdík – Frolík – Chotěbor 1999*, 96). The main reason is considered to be the fact that if the tiles survived in large pieces, they represented a form of material that was relatively large in volume but also relatively light, which could be used to quickly fill in the necessary space and would sink very little. Fired ceramic material moreover contains no water and, unlike piles of earth, soaks up very little water from its surrounding environment (*Durdík – Hazlbauer 1993*, 311).

2.2 The larger cellar

The larger of the two cellars was deepened more pronouncedly into the original terrain. The first layer over the subsoil (808) was a light-grey to greyish-brown clay with stones. In the section it is reflected as a discontinuous layer, interrupted in places by the subsoil. It was also identified in the area of the smaller cellar as layer 808A. The floor layer of the larger scale was designated as layer 806, which abuts against the sill of the portal. Most of the cellar area was filled with more or less horizontally laid sandy to sand-clay layers, with mortar, bricks, and stones mixed in. Based on its character and on the fact that it is a layer containing few finds, it is possible to assume that, for the most part, this involves construction rubble (layers 677A-E – *fig. 4*).

2.3 Summary of the field context

The ability to learn about the entire archaeological situation of the cellars is limited substantially by the fact that during levelling work on Jiřské Square, which evidently took place soon after the building was demolished, the terrain in the surrounding area was lowered. It was thus not possible anywhere to determine a direct relationship between the cellars and their immediate surroundings. There were moreover recent interferences in the western and eastern walls of the cellars. According to the layout, the excavated cellars were probably part of a two-room, cellared, single-story building. Owing to the destruction of its above-surface parts due to recent disturbances, it was not possible to determine where the entrance to the building was located. The rectangular patterned depression in the ground with the remains of wood, which was detected in the smaller cellar, could possibly be interpreted as the foundation for a set of stairs, connecting the cellar to the residential floor of the building (*Boháčová – Frolík – Žegklitz 1989*, 199). The stone-lined well discovered in the eastern corner of the smaller cellar evidently served as a water cistern. Given the character of the find assemblage, it seems unlikely that it was used as a cesspit after it lost its original function.

3. Plans

The authors of the excavation identified the described cellars with the house of the armoury scribe (*Boháčová – Frolík – Žegklitz 1989*, 199). For this they drew on "Wohlmut's Plan" of Prague Castle[3)], dating to the period around 1569. The plan depicts the house of the highest scribe with an oblong dispositions, which is disturbed on the southeast corner by the construction of a slightly oblong tower (*thurm*), probably built in connection with the second Renaissance reconstruction after 1553[4)]. The shorter, southern wall of the tower directly connects to the at that time already stark house of the armoury scribe (*des zugschreiber losement*), with a markedly elongated layout (length to width ratio of 3 : 1). Immediately next to this building, southward towards the square, there is a building that is to be demolished (*dis hause sol [zum] weg kommen*). Between the houses of the armoury and the highest scribe there is a rectangular space of ground for "large pieces" (*der Blatz zum grose ge… hat auch der hautschreiber herre gehabt*), also referred to as a *městiště* – a land plot – belonging to the house of the highest scribe. This land plot stretched northward towards the narrow

Note 3:
The plan of St. George's Convent and its immediate surroundings, Central State Archives, signature no. ČDKM – IV- P, carton 191, copy in the Archives of Prague Castle. The German markings for particular buildings are taken from Wohlmut's Plan.

Note 4:
In that year, the highest scribe, Wolf of Vřesovice was granted 1000 groschen to build a house, which would belong to the office of the highest scribe (*Sněmy české 1880*, 656).

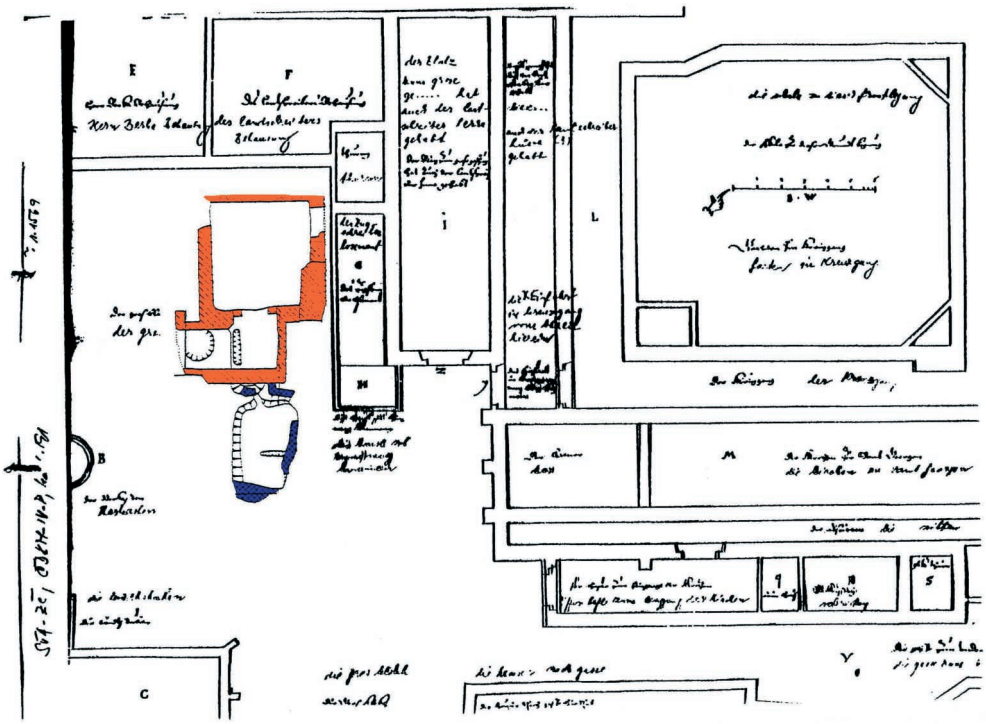


Fig. 5. A comparison of the archaeological field context with a section of Wohlmut's Plan of Prague Castle. The remains of the masonry that was probably part of the house of the armoury scribe are marked in red, and blue indicates the remains of the building that is marked for demolition (adapted according to *Boháčová – Frolík – Žegklitz 1989*).
Obr. 5. Porovnání zjištěné archeologické situace a výřezu Wohlmutova plánu Pražského hradu. Červeně jsou znázorněny zbytky zdiva, které pravděpodobně náležely domu zbrojního písaře, modře pozůstatky domu, který má být zbořen (upraveno dle *Boháčová – Frolík – Žegklitz 1989*).

street by the inner walls and southward as far as the entrance into the cloister of St. George's Convent (*fig. 5*).

A very similar depiction is of the situation on the northwest corner of Jiřské Square in the plan of the grounds of Prague Castle created by an unknown author, contained in the collection of the Uffizi Gallery[5)] and dated at earliest to 1614. This plan emerged from copies of earlier drawings. As in Wohlmut's Plan, it is possible to identify in it the house of the highest scribe and its adjacent tower. At the site where Wohlmut identifies the house of the armoury scribe, it is clear that the individual buildings differ in sizes and proportions, but agree in number.

However, in both cases it is necessary to realise that, while the author has attempted to capture the layout of the built-up area on the square, it is done without a more accurate orientation, thus rather schematic in character. It can therefore be assumed that it was important for the authors to capture the relative position of the buildings without paying attention to accurate measurements. At the same time, it must also be remembered that plans often depict an earlier status, and thus buildings from various, not too temporarily remote periods can appear in the plans as contemporary.

Note 5:
Paper, 329 x 410 mm in format, watermark from 1613-1654 of the paper mill in Benešov nad Ploučnicí, a drawing created in several stages using different techniques. In the first stage, the building plans in the mediaeval radius are drawn on a blank map of squares; fortifications in black Chinese ink and in hard pencil in the left part of the sheet; in the second stage, a sketch of the fortification bastions is done in soft pencil; in the third stage, a signed grid is applied in the central part. In the upper part of the plan, a single inscription is found: "*Scala di pessi 20 di…*"; the scale of the plan is believed to have been 1: 1750. The photocopy of the plan is deposited in the Archives of Prague Castle.

4. Finds

4.1 Ceramics

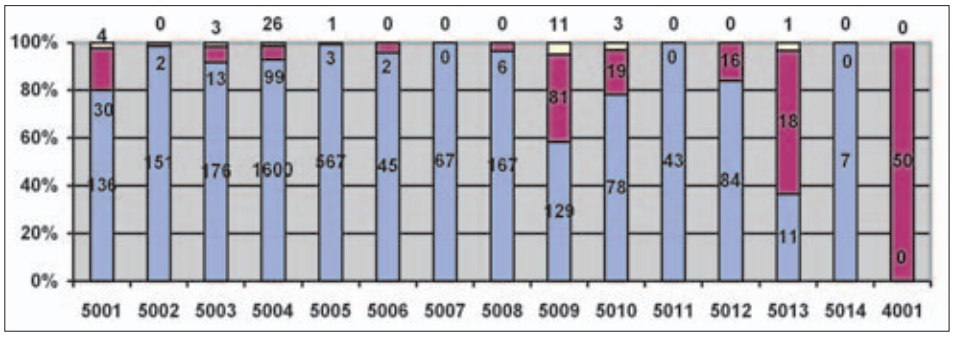
To evaluate the collection of ceramics processed, ceramics classes were used that were defined on the basis of the technological properties of the potsherds identified macroscopically. In each case the colour, composition, and thickness of the shard was studied, along with the technology of firing, the colouring and position of the glaze, and finally also the type of decoration. Altogether 14 ceramic classes were defined, belonging to Early Modern ceramics, and one class for mediaeval ceramics (*tab. 1*).

Tab. 1. Definition of ceramic classes. / ***Tab. 1.*** Definice keramických tříd.

	Colour	Non-plastic components	Fracture colour	Firing	Surface	Glaze	Decoration	Thickness of potsherd
5001	grey to light brown grey	up to 2 mm 5-10 % mica	grey to brown grey	reduction; medium hard, sandwich effect	unglazed	none	wheel-pressed decoration	3-5 mm
5002	grey to dark grey	up to 2 mm up to 5 %	grey	reduction; medium hard, smoked	double-sided smoothing	none	wheel-pressed decoration	2-3 mm
5003	light grey to grey	up to 1 mm up to 5 %	grey	reduction; hard; high quality	smoothed in zones	none	wheel-pressed decoration	3-4 mm
5004	light yellow cream to beige	up to 2 mm, 5-10 %	cream to beige	oxidation; medium hard	smoothed	inner; shades – ochre brown,yellow	grooving	2-4 mm
5005	brick to brown red	up to 1 mm up to 5 %	brick to brown red	oxidation; medium hard to hard	smoothed	inner; shades – brown	wheel-pressed decoration	3-5 mm
5006	light yellow cream to light beige	up to 2 mm, 5-10 %	cream to beige	oxidation; medium hard	glazed	inner; shades – ochre, brown, yellow outer; shades – yellow, green	painting; polychroming; marbling	2-4 mm
5007	brick to brown red	up to 2 mm up to 5 %	brick red	oxidation; hard	glazed	inner; shades – brown outer; various shades	painting; polychroming; marbling	3-4 mm
5008	light yellow to beige	up to 2 mm, 5-10 %	cream to beige	oxidation; medium hard	-	none	grooving	3-5 mm
5009	light to dark brick red	up to 2 mm, 5-10 %	light to brick red	oxidation; medium hard to hard	unsmoothed	none	wheel-pressed decoration	2-4 mm
5010	brick to brown red, dark grey	2-5 mm, 10-15 %	dark brick red; core - grey	oxidation; medium hard; sandwich effect	unsmoothed	none	embossed – finger-grooving	5-7 mm
5011	yellow cream to light ochre	up to 1 mm up to 5 %,	cream	oxidation; hard	smoothed	white engobe + various colours of glaze	painting	3-4 mm
5012	brick red	up to 2 mm up to 5 %	brick red	oxidation; very hard	glazed	inner – clear outer – white engobe + various colours of glaze	painting	3-5 mm
5013	grey	sintered	grey	oxidation; very hard	glazed	double-sided salt glaze; brown, grey	embossed, wheel-pressed decoration	1.5-3 mm
5014	light yellow cream	up to 1 mm up to 2 %,	light yellow cream	oxidation; very hard	glazed	double-sided – opaque cream	painting	6-7 mm
4001	grey	2-5 mm, 5-10 %, mica	grey	oxidation; medium hard; sandwich effect	unsmoothed	none	grooving	5-7 mm

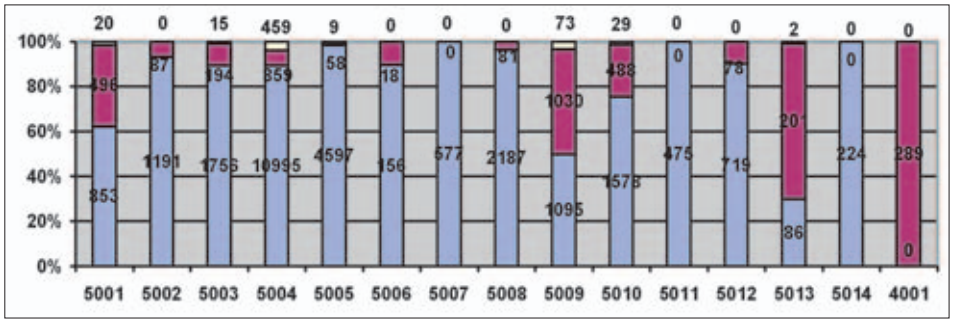
Based on the stratigraphic analysis mentioned above I believe that, with the exception of the layers that lay just above the subsoil (798, 806, 808, 808A), it is impossible to clearly link the unearthed artefacts to the period when the house was in use. The finds from the fill layers will therefore be regarded as secondarily relocated material. For the ensuing processing of individual finds, three sub-horizons were created – sub-horizon A, which encompasses a 2.50 m thick formation, filling the area of the two cellars (layers 681, 682, 683, 684, 688, 690, 691, 691A, 753, 754, 755, 768, 782, 782A, 785, 798); sub-horizon B – the fill of the well – feature no. 234 (layers 788, 794, 795, 796, 797, 800, 801, 802, 809, 810, 811); sub-horizon C – the floor layers of both cellars (layers 806, 808, 808A, 812). When evaluating the finds from all three sub-horizons no significant difference or dividing line was discovered that would suggest any chronological break between them.

The analysis of finds produced several pieces of indirect evidence that sub-horizon A is genuinely made up of waste fill. Despite a relatively meticulous processing of the material, in the final phase only 17 vessels could be reconstructed, and the material was otherwise mainly in very fragmented condition. At the same time, it can be assumed that this fill was created within a very short time frame as, when the vessels were being reconstructed, it was possible to match pieces that were taken from various different layers (682, 683, 688-91).



Graph 1. An overview of the proportion of the various types of ceramic classes in the sub-horizons, by piece. Yellow – sub-horizon C; red – sub-horizon B; blue – sub-horizon A.
Graf 1. Přehled zastoupení jednotlivých keramických tříd v rámci subhorizontů podle kusů. Žlutá – subhorizont C; červená – subhorizont B; modrá – subhorizont A.

A total of 3261 ceramic fragments were taken from the fills of both cellars (sub-horizon A), 339 pieces were taken from the fill of the well (sub-horizon B), and 49 pieces from the floor horizons of both cellars (sub-horizon C). The most persuasive informational value statistically comes from finds that were taken from the cellar fill. These were primarily finds of a light firing ceramic with an inside glaze (ceramic class 5004 – 49 %). The second most numerous ceramic class of finds was a brick-red firing clay with an inside glaze (5005 – 17.5 %). The proportion of reduction fired (ceramic classes 5001-5003), light unglazed (ceramic class 5008), and thin-walled brick-red unglazed goods (ceramic class 5009) was around 5.0 %. Ceramics glazed on both sides (ceramic classes 5006, 5007), ceramic with light-coloured engobe (ceramic class 5011), and so-called Beroun-type ceramics (ceramic class 5012) can be regarded as the least distinctive admixture in terms of percentages (1.4-2.6 %), which however are of significance in chronological terms. Stoneware finds (ceramic class 5013), at just 11 pieces, made up only 0.3 %; 0.2 % of the total were majolica (ceramic class 5014). The proportion of individual ceramic classes in percentages was evaluated on the basis of the number of found fragments but also on the basis of weight (in grams). A comparison (*graphs 1, 2*) shows that the proportion in the presence of individual ceramic categories in the whole collection varies little.



Graph 2. An overview of the proportion of the various types of ceramic classes in the sub-horizons, by weight in grams. Yellow – sub-horizon C; red – sub-horizon B; blue – sub-horizon A.
Graf 2. Přehled zastoupení jednotlivých keramických tříd v rámci subhorizontů podle gramů. Žlutá – subhorizont C; červená – subhorizont B; modrá – subhorizont A.

The ceramics collection can be divided into basic four groups based on the technology used in their production. The first and largest group is finds of reduction fired or oxidation fired ceramics. The second group contains fragments of stoneware vessels. The third, technologically specific, group is a single find of a majolica albarello. The final, fourth, group is comprised

Note 6:
The name of the group derives from the location of the workshops that operated in Beroun from the mid-16th century until 1639. The production from these workshops represented valuable items in Czech households, and they were evidently used also for decorative purposes (*Winter 1895*, 114). Indirect evidence that these were valuable goods are the inventory lists of the personal estate of deceased, where alongside tin vessels, paintings, and other valuable items, also a type of ceramics described as "two white clay painted bowls" tends to be listed in the second half of the 16th century.

Note 7:
This corresponds with the conclusion that, based on an analysis of the collection from Strážnice, was put forth by J. Pajer. According to his findings, around 1550 late mediaeval decorative techniques were on the wane and new techniques gradually began to emerge (*Pajer 1983*, 73, tab. 1).

Note 8:
At present, there is no clear terminology that has been elaborated to describe the rims of ceramics from the Early Modern Age. When identifying individual types I drew on the following authors: *Krajíc 1997*, *1998*; *Nekuda 1975*, *1985*; *Nekuda – Reichertová 1968*; *Pajer 1982*, *1983*; *Zápotocký 1979*.

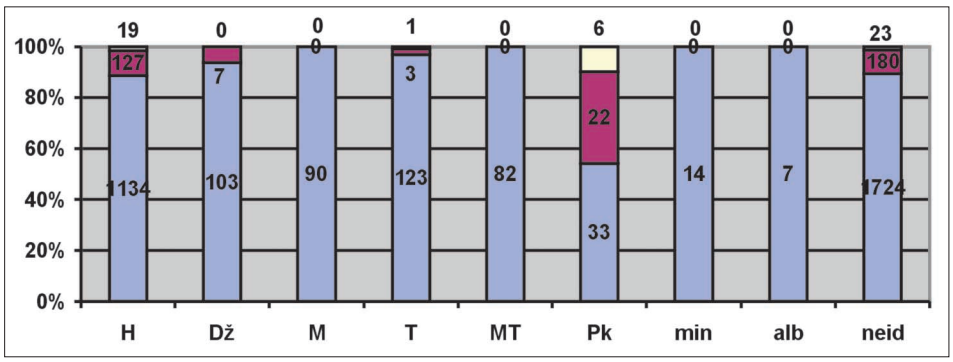
of several fragments of mediaeval ceramics. Both in the case of reduction fired and oxidation fired goods the clay was well prepared, and involves clay that is typical for shaping thin-walled vessels. The only exception to this feature is a brick-red firing clay, strengthened more noticeably with quartz sand (ceramic class 5010), intended for producing large and deep bowls. Beroun-type[6)] ceramics can be identified as a separate sub-group (ceramic class 5012).

The inside glaze on the tableware and kitchenware in this collection cannot be regarded as being a new trend in development and is rather a standard occurrence. Glaze is found exclusively on oxidation fired goods, on pots, tripods, and flanged bowls and deep bowls. Inner glaze adds to the technical quality of the goods, especially in terms of their permeability and the ease with which they can be cleaned. Vessels with an inner glazing are often found with the glaze extending over the rims, to the handle or the grip, and it is not uncommon even to find accidental drops where the glaze has run elsewhere. The colours used in lead glazes are based on the shades of ochre, brown, and green, which merge together or change on various parts of the vessels. In the case of double-sided glaze, one can count on the fact that the glazing has changed from its original functional position to the level of a decorative element. In the case of salt glaze, which is used on stoneware, brown is the predominant colour.

We can generally sum up that the collection at hand is one in which late mediaeval methods of decoration and motifs are on the wane, while Early Modern decorative techniques are already present in the form of painting by paintbrush, marbling, and the use of two-sided glazing[7)].

4.1.1 Kitchenware ceramics

The collection under study is predominated by finds of pots (*graph 3*). In all three sub-horizons a total of 74.3 % of the identifiable pieces were from pots, which is far more than for any other type of vessel. Pot-shaped vessels are found in sizes from cups to large vessels of a storage type. Among the items whose entire bodies could be reconstructed, a slender ovoid shape predominated, with the largest bulge around the upper third of the height of the vessel. The rims were on average around 14-25 cm in diameter, but one with a diameter of 47.2 cm was recorded. Among the rims[8)], the most common in the group of ceramics made of light firing



Graph 3. An overview of the fragments of particular ceramic shapes in the sub-horizons. Yellow – sub-horizon C; red – sub-horizon B; blue – sub-horizon A. H – pot; Dž – jug; M – deep bowl; T – tripod; TM – flanged bowl; Pk – lid; Ph – goblet; min – miniature and pharmaceutical vessels; alb – albarello; neid – unidentifiable potsherds.
Graf 3. Přehled zlomků jednotlivých keramických tvarů v rámci subhorizontů. Žlutá – subhorizont C; červená – subhorizont B; modrá – subhorizont A. H – hrnec; Dž – džbán(ek); M – hluboká mísa, pernice; T – trojnožka; TM – talířovitá mísa; Pk – poklička; Ph – pohár; min – miniatura, lékárenská nádobka; alb – albarello; neid – neidentifikovatelné střepy.

clay and with an inside glaze (ceramic class 5004) were oval-shaped rims. The second most common type of rim was slatted frill, or the suggestion of one, which can be considered characteristic mainly for the brick-red firing clay with an inside glaze (ceramic class 5005). In addition to these main shapes, there were also pots with folded over, horizontally levelled, upward-stretched, or S-shaped rims.

Based on the relatively numerous fragments of handles, it can be assumed that in most cases these were pots with handles. The strap handle was usually

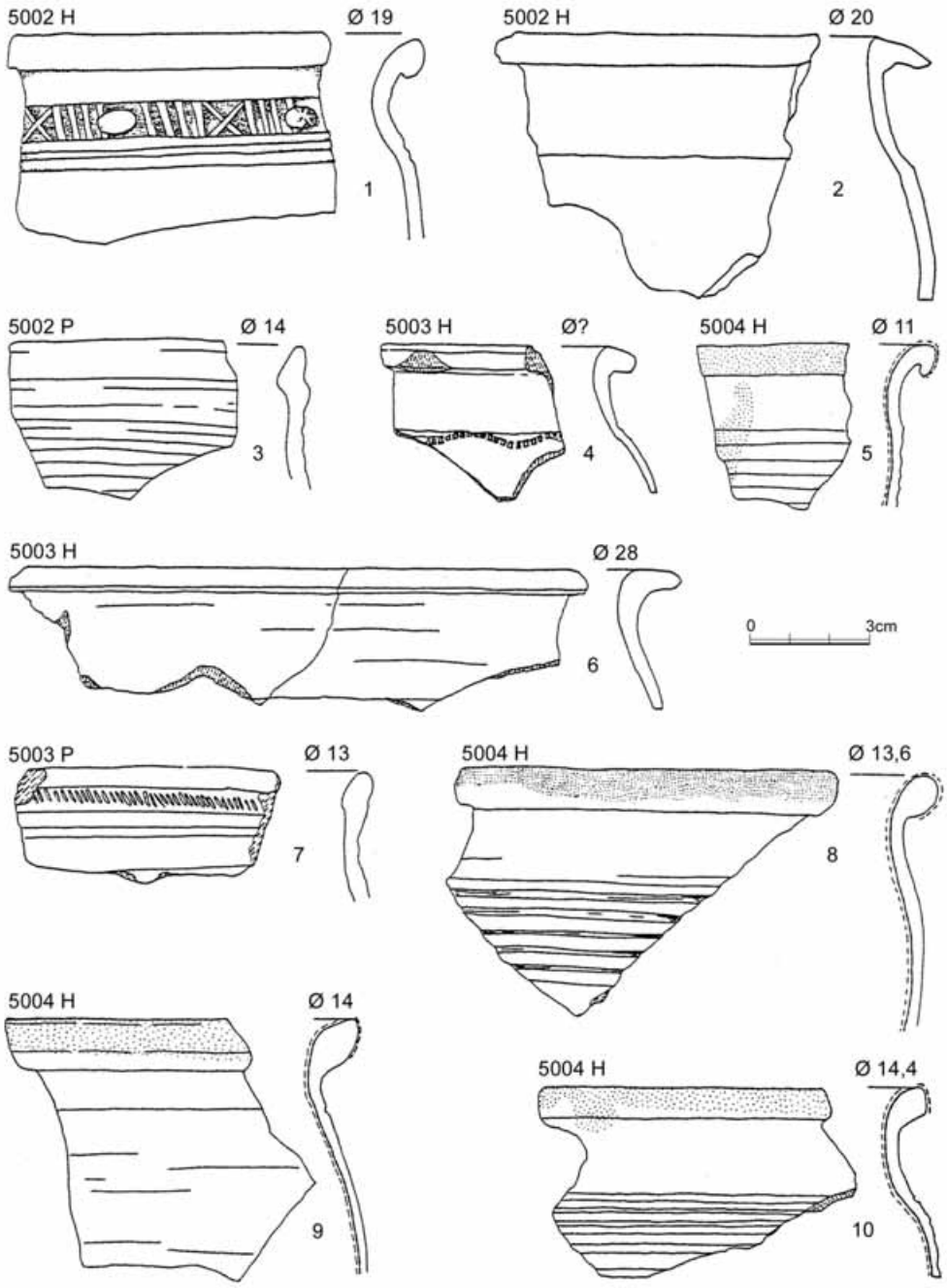


Fig. 6. Ceramic finds – sub-horizon A. A four-digit number (500X) indicates the ceramic class that the vessel belongs to. After the symbol Ø, the rim diameter of the vessel is cited. H – pot; P – goblet; T – tripod; M – bowl; Dž – jug; TM – flanged bowl; láhev – bottle; pekáč – oven pan; trojsrostlík – triple cup *(also applies to the following figures)*.
Obr. 6. Nálezy keramiky – subhorizont A. Čtyřmístné číslo (500X) označuje keramickou třídu, do níž střep nádoby patří. Za symbolem Ø je uveden průměr okraje nádoby. H – hrnec; P – pohár; T – trojnožka; M – mísa; Dž – džbán; TM – talířovitá mísa *(platí i pro následující obrázky)*.

attached to the rim and, at approximately the upper third of body, and it usually had an oblong or oval-shaped profile, sometimes with a grooved upper surface. The assortment of common pots also included a handle-less flowerpot (*fig. 17: 3*). The largest number represented were oxidation fired pots with a transparent inner glaze[9)] (ceramic class 5004 – 58,7 %). Reduction fired pots (ceramic classes 5001-5003) made up 14.2 % of all the ceramic finds[10)].

Overall, a wheel-pressed decoration was used on three types of ceramic material. The first is the reduction fired ceramic (ceramic classes 5001-5003 – *fig. 6: 1, 4*; *17: 6*), which is primarily found in the form of a band just below the neck; the same type of decoration is found with the unglazed brick-red firing clay (ceramic class 5009 – *fig. 9: 5; 17: 7; 18: 6*). In the case of brick-red firing clay, a surface decoration on a large part of the body was found, executed in different variations of a segmented wavy line (ceramic class 5005). In the case of oxidation fired pots, both glazed (ceramic classes 5004, 5005) and unglazed (ceramic classes 5008, 5009), a simple or multiple grooving is found[11)] (e. g. *fig. 6: 5, 8; 7: 1, 4, 6; 8: 2, 4; 16: 1*).

Note 9:
Cf. *Pajer 1982*, 63.

Note 10:
Cf. finds from a cesspit in Tábor from the house of the armoury girdler, house no. 220, layers 3 and 4, dated to the period between the second half of the 16th century to the start of the 17th century, where reduction fired work made up 92.2 % of the total number of finds (*Krajíc 1998*, 175 tab.). From the same geographical area come finds from a well in Soběslav, which are dated to the period between the second half of the 15th century and the first half of the 16th century. This is an earlier period, but even in this case reduction fired ceramics predominate among the finds and make up 90.0 % of them (*Krajíc 1990*, 106).

Note 11:
A typical demonstration of how the body of vessels was articulated at the end of the late Middle Ages – from the middle of the 15th to the middle of the 16th century (*Pajer 1983*, 64).

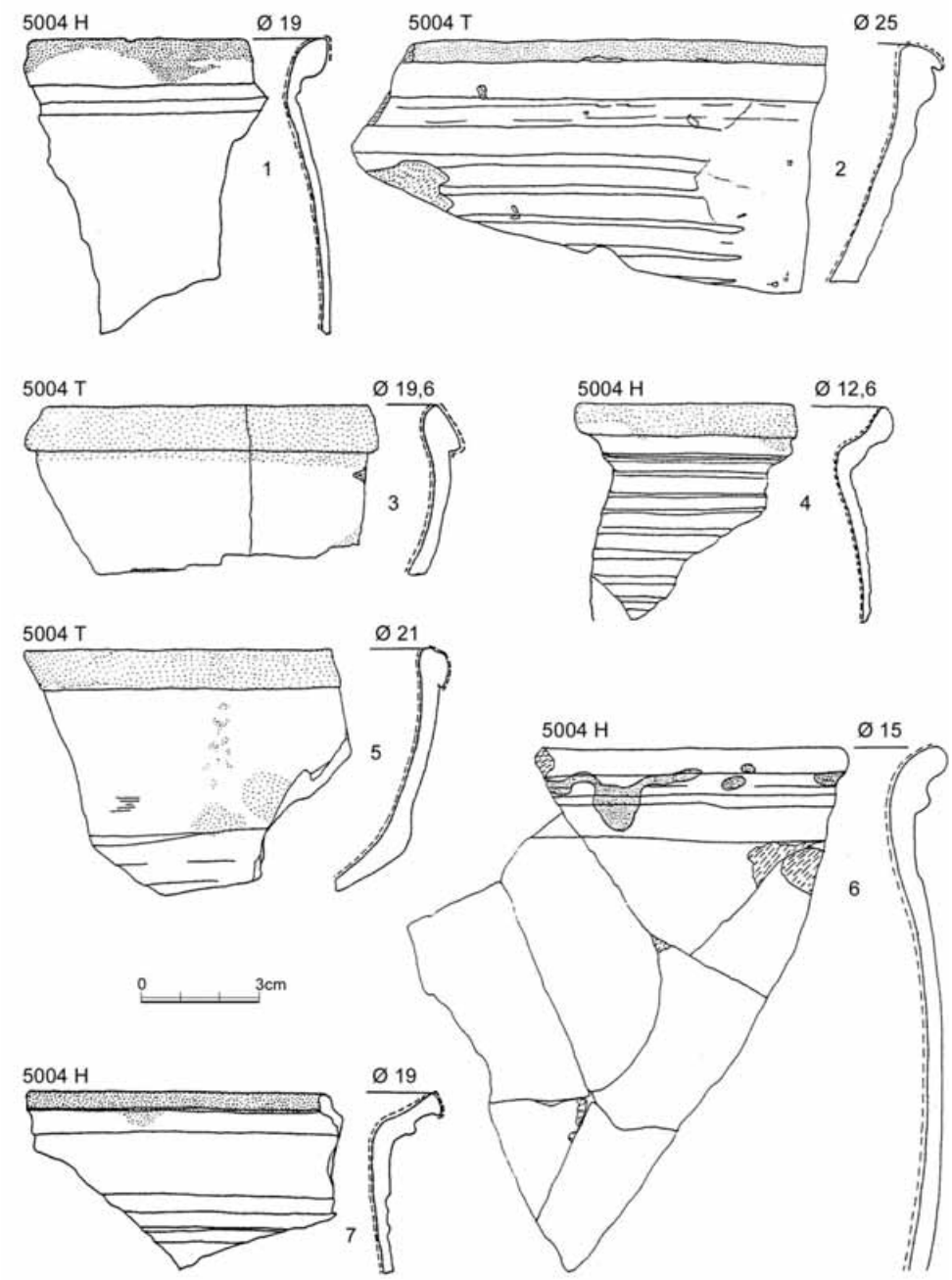


Fig. 7. Ceramic finds – sub-horizon A.
Obr. 7. Nálezy keramiky – subhorizont A.

The second largest group of ceramic shapes is tripods (7.4 %). It was possible to reconstruct three complete ones (*fig. 16: 5*; *18: 1, 2*). Typologically these are later variants, where the height of the feet matches or even just slightly exceeds the height of the body. All of the fragments unearthed were fired in an oxidation atmosphere and all had inner glaze (ceramic classes 5004, 5005, 5007). In one case (*fig. 18: 1*) we find the use of white engobe, with green transparent glaze[12)]. By far the most predominant rims were ovoid rims and frills. In terms of decoration, the tripods can be divided into three categories. First, there are tripods with an undecorated body (*fig. 7: 3, 5*), which is found among both the light fired ceramics (ceramic class 5004) and the brick-red firing clay (ceramic classes 5005, 5007). In the case of light ceramics it is possible, as with the pots, to find a very distinctive grooved spiral (*fig. 7: 2*). The wheel-pressed decoration, which covers the entire body of the vessel, is typical for the brick-red firing ceramics (ceramic classes 5005 – *fig. 8: 3*; *18: 2*). Among the finds, 28 pieces of broken-off feet with a circular profile were

Note 12:
Analogous use of white engobe in the case of a tripod (*Dohnal – Koucký 2000*, 374). A tripod with a flat bottom tends to be cited as earlier (*Krajíc 1998*, 168).

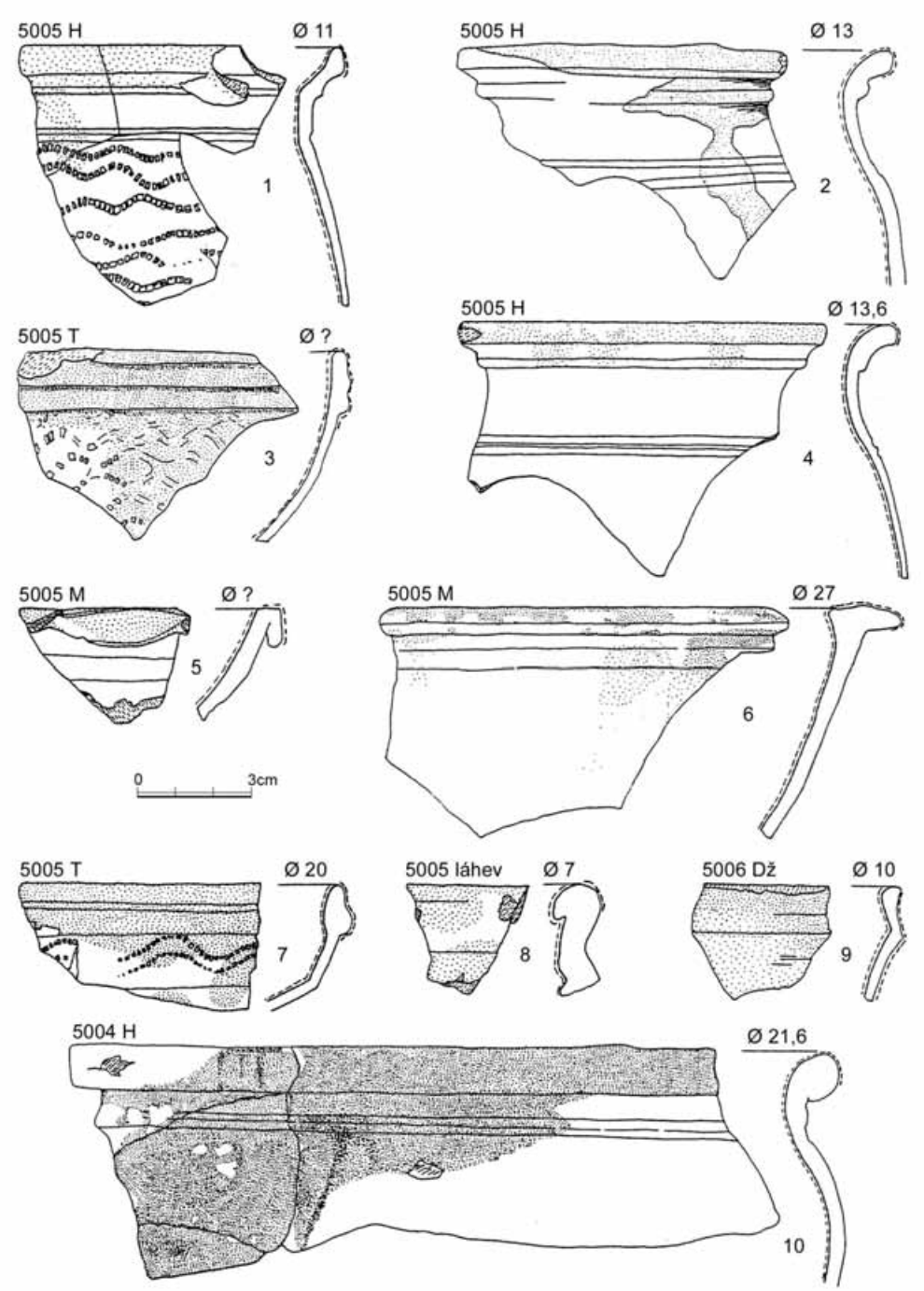


Fig. 8. Ceramic finds – sub-horizon A.
Obr. 8. Nálezy keramiky – subhorizont A.

found, and 10 grips terminating in a narrow collar; both the feet and grips bear traces of glazing.

The finds of lids included 61 pieces[13)] (3.5 %). With the exception of one fragment of the rim of a reduction fired lid, the other cases involved solely oxidation fired goods (ceramic classes 5008, 5009 – *fig. 10: 9-12*). The modelling and placement of the lid knob is individual. More than half of the lids have a rim diameter of around 12 cm. The second large group is made up of lids with a diameter of around 20 cm. One fragment is of a jug lid (*fig. 10: 9*).

Identified in the collection of finds were the remains of an oven pan of a semi-cylindrical shape, with a straight rim and a flat bottom[14)] (ceramic class 5005), which was evidently made by splitting in half the original bottle-shaped vessel in a semi-shriveled state. A grip was fitted on the shorter, perpendicular side, and it is assumed that the lip was fitted on the opposite side (*fig. 18: 7*).

Note 13:
In comparison with other collections, this is the highest percentage of lids in the entire set. In the house of the armoury girdler in Tábor, there were no lids at all found in the latest layers (*Krajíc 1998*, 168).
In the case of the town lot in Sedlčany, a low number of finds of lids is cited, "which is no departure from findings to date in the study of archaeological collections of Early Modern ceramics" (*Dohnal – Koucký 2000*, 374). Only a ceramic collection from a well in Soběslav, dated to the period ranging from the second half of the 15th to the first half of the 16th century, cites a percentage of lids at 6.1 % (*Krajíc 1990*, 98).

Note 14:
A similar oven pan was used in the Rudolphine kitchen (*Bravermanová – Březinová – Frolík – Hlaváček – Chotěbor – Kubková – Šafránek – Vávrová 1997*, V/298/11).

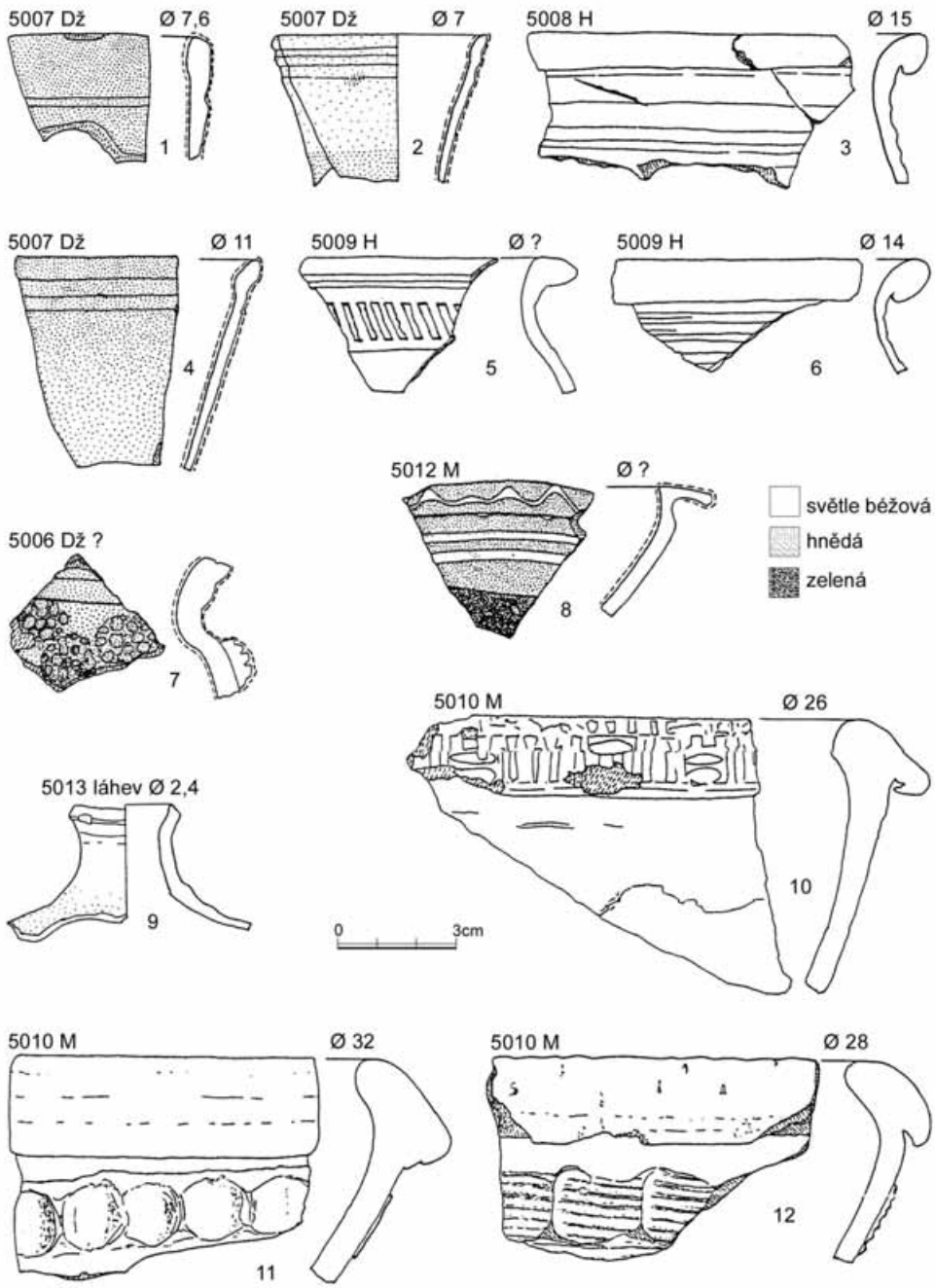


Fig. 9. Ceramic finds – sub-horizon A. White – light beige; light dotting – brown; dark dotting – green.
Obr. 9. Nálezy keramiky – subhorizont A.

4.1.2 Tableware ceramics

Of the total number of 1722 identified pieces, 110 belong to jugs. They thus make up the third largest group of finds (6.4 %). The first from the two reconstructed pieces is a reduction fired, slightly oval-shaped jug, with a gently open out neck (*fig. 17: 2*). The second reconstructed shape was a jug of an elongated ovoid shape with the largest bulge being on the lower third of the vessel's height; the neck, probably gently conical to almost cylindrical in shape, and the rim did not survive (*fig. 15: 2*). The body of the jug is decorated with painted, stylised plant motifs in the form of light beige acorn combined with geometric motifs. The style the jug was rendered in, the ceramic material, and the decorative ornamentation are typical of so-called Beroun-type ceramics[15)] (ceramic class 5012). Also worth noting is the surviving part of the body of a large-sized jug moulded into a barrel shape, which also belongs to the category of Beroun-type ceramics (ceramic class 5012). The central decorative

Note 15:
For a more detailed description of this ceramic, see *Matoušek – Scheufler 1983*.

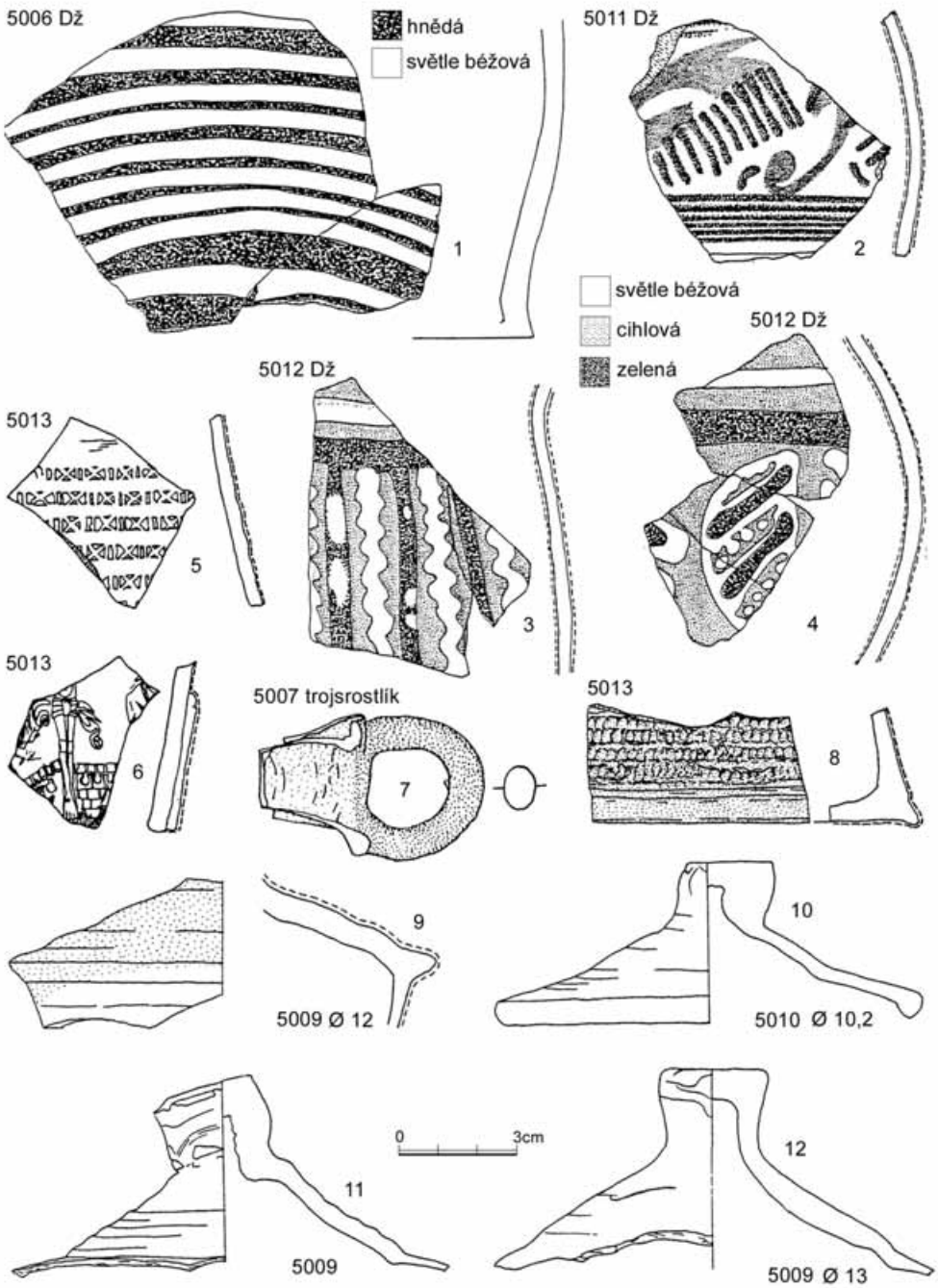


Fig. 10. Ceramic finds – sub-horizon A. White – light beige; light dotting – brick red; dark dotting – brown (1), green (2-4).
Obr. 10. Nálezy keramiky – subhorizont A.

motif is a wide band of stylised plant motifs, pomegranates, decorated with counter-poised volutes (*fig. 15: 1*) where they join. In addition to these three distinct finds also fragments of rims (*fig. 9: 1, 2, 4*) and bodies (*fig. 10: 1-4*) were found. Most of these fragments are of ceramic material glazed on both sides (ceramic classes 5006, 5007). In the case of the rims of jugs, most are upwardly stretched, simply moulded rims, with a diameter between 7 and 11 cm.

In total, 4.8 % of the identifiable pieces belong to flanged bowls[16]. Finds of these bowls are associated with ceramic categories with an inner glaze (5004, 5011, 5012). The shape of the rim is largely predetermined by the overall shape of the vessel. The walls of the bowl open out in a funnel-shaped slant towards the rim, followed by an inner flanging of an outwardly slanting sub-rim, terminating in an almost upwardly stretched, simply shaped rim, sometimes reinforced on the outside. What are decisive for the resulting shape of the bowl is, to a certain extent, the conspicuousness and the placement of the flanging.

Note 16:
J. Pajer refers to this shape as a flanged bowl (*Pajer 1983*, 30).

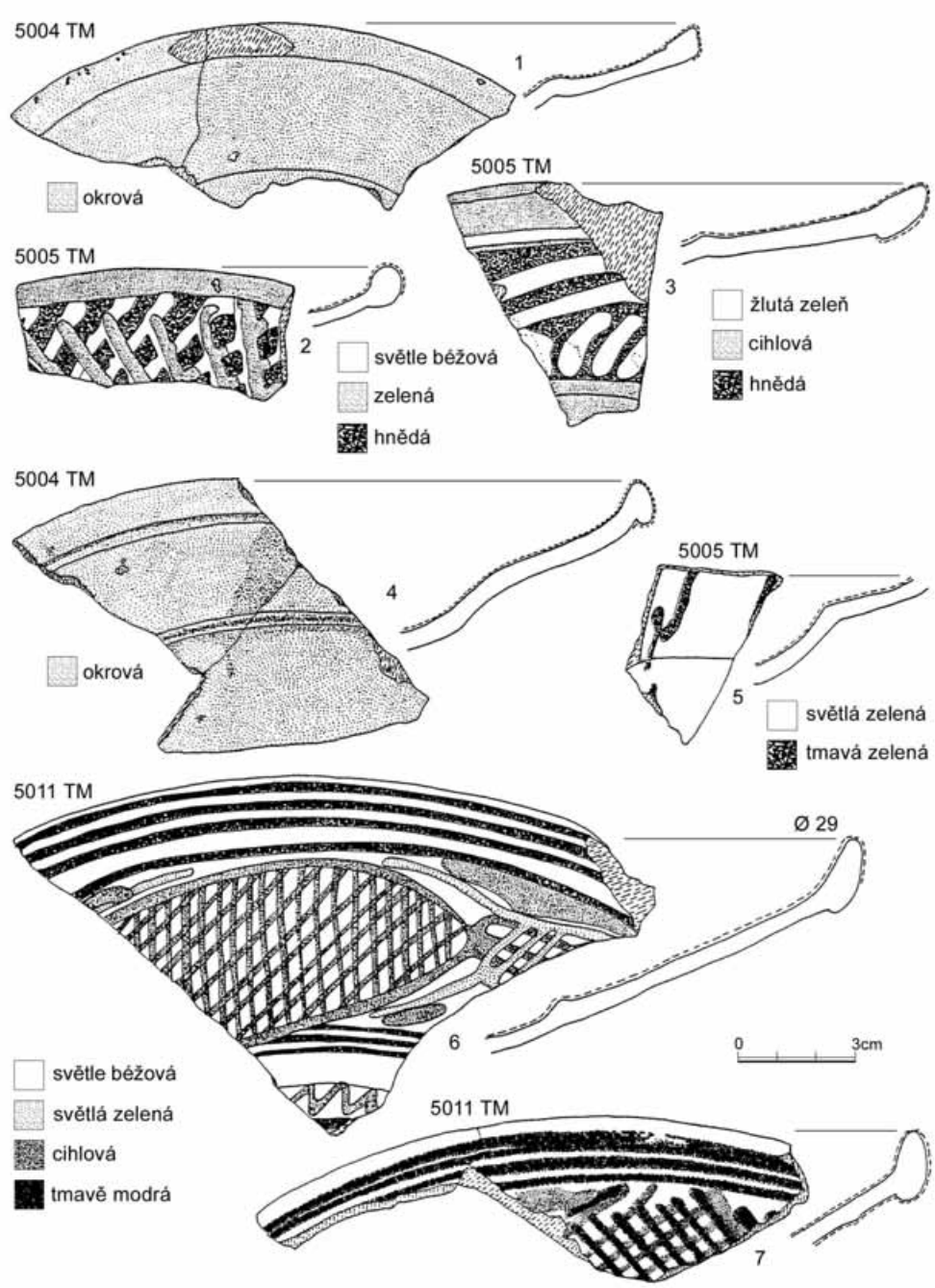


Fig. 11. Ceramic finds – sub-horizon A. White – light beige (2, 6, 7), yellowish green (3), light green (5); light dotting – ochre (1, 4), brick red (3), green (2), light green (6, 7); dark dotting – brown (2, 3), dark green (5), brick red (6, 7); black – dark blue (6, 7).
Obr. 11. Nálezy keramiky – subhorizont A.

The best preserved of the shapes that could be reconstructed in most part was a flanged bowl with a simply moulded rim with a pronounced outer edge. The bowl is made of gently washed, white firing clay (ceramic class 5011) and has an abundance of painted decorations. The main theme on the widened sub-rim is a zoomorphic motif of a fish, rendered in contours and filled in with vertical brick-red wavy lines. The area of the bottom is divided into four parts, each of which contains a small red heart (*fig. 13*). The same ceramic material (ceramic class 5011) as that of the previous shape is also used for the smaller-sized flanged bowl with an almost flat upper part and a simply moulded rim, its sub-rim decorated with alternating geometric motifs and trefoils (*fig. 12: 2*). The outer side of the body of this bowl bears striking traces of turning on a wheel. An example of so-called Beroun-type ceramics (ceramic class 5012) is the large fragment of a flanged bowl with a simply moulded rim, decorated with a plant motif of climbing plants in a combination of light beige and green glaze (*fig. 14: 1*). The same ceramic material (ceramic class 5012) was also used to make another flanged bowl, of which only

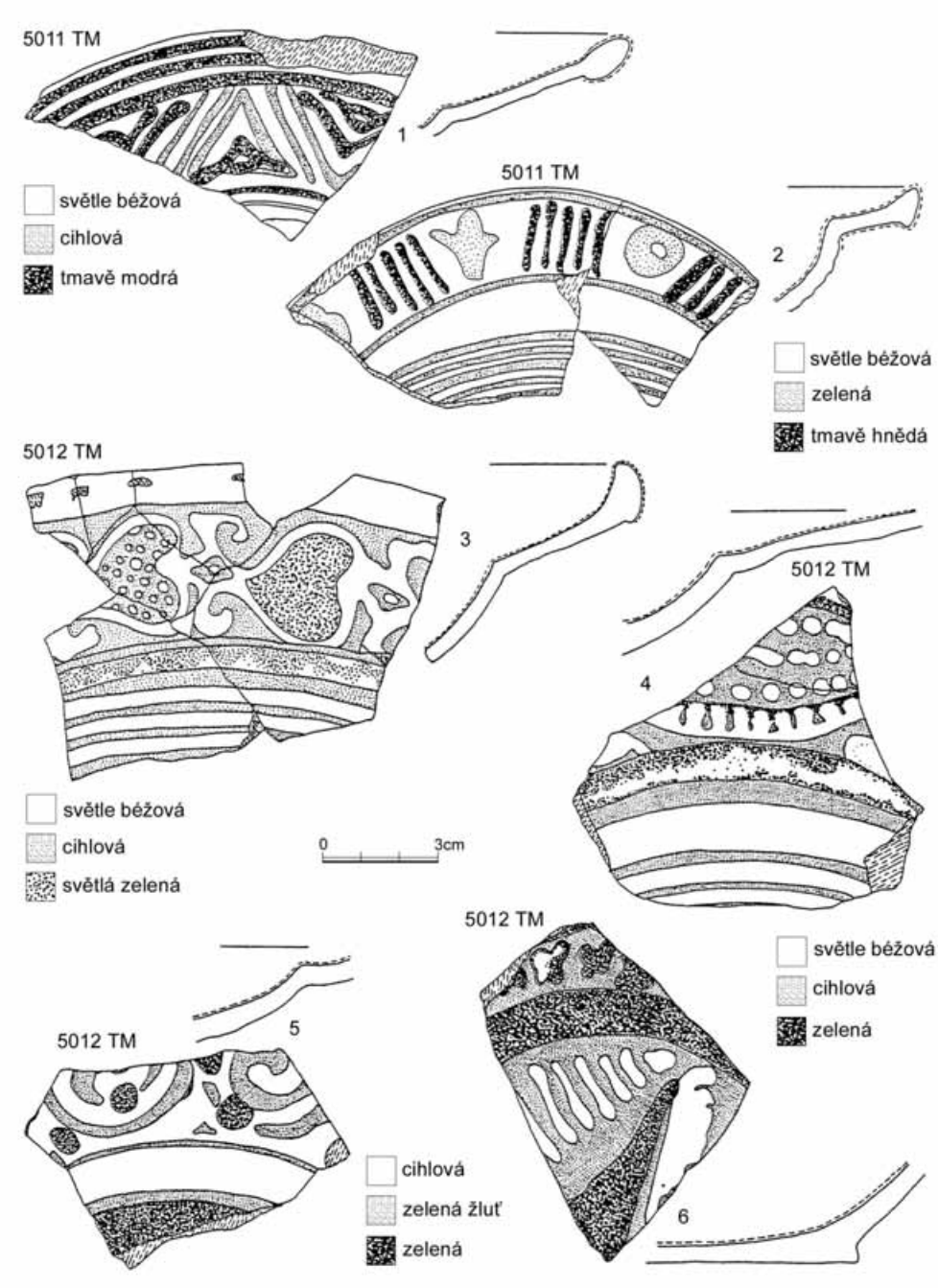


Fig. 12. Ceramic finds – sub-horizon A. White – light beige (1-4, 6), brick red (5); light dotting – brick red (1, 3, 4, 6), green (2), greenish yellow (5); dark dotting – dark blue (1), dark brown (2), light green (3), green (4-6).
Obr. 12. Nálezy keramiky – subhorizont A.

the sub-rim part with a geometric decoration survived (*fig. 14: 2*). From the other potsherds unearthed it is difficult to identify the original decorative motifs as, in most cases, only fragments have survived (*fig. 11*; *12*).

In the collection studied, it was possible to reconstruct one large, deep bowl[17)] with a slightly conical body and a rim diameter of 28 cm. The outer surface of the bowl was decorated with three horizontal bands of finger-pressed decoration with four horizontal ribs in each of the hollows. The rim is oval-shaped, undercut, slightly inturned, decorated on the upper surface with three rows of short, vertical wheel-pressed lines (*fig. 18: 3*). Also found were several fragments of both rims and bodies of deep bowls (*fig. 9: 10-12*). All of them were made of brick-red firing clay with a substantial admixture of siliceous grains (ceramic class 5010). Among all the finds, a sandwich effect appeared on the potsherd break, emerging as a result of the excessive thickness of the piece, so that an even firing could not be achieved. The estimated diameter of the rims of these bowls ranges from 26 to 32 cm.

Note 17:
More on its function in *Pajer 1983*, 46.

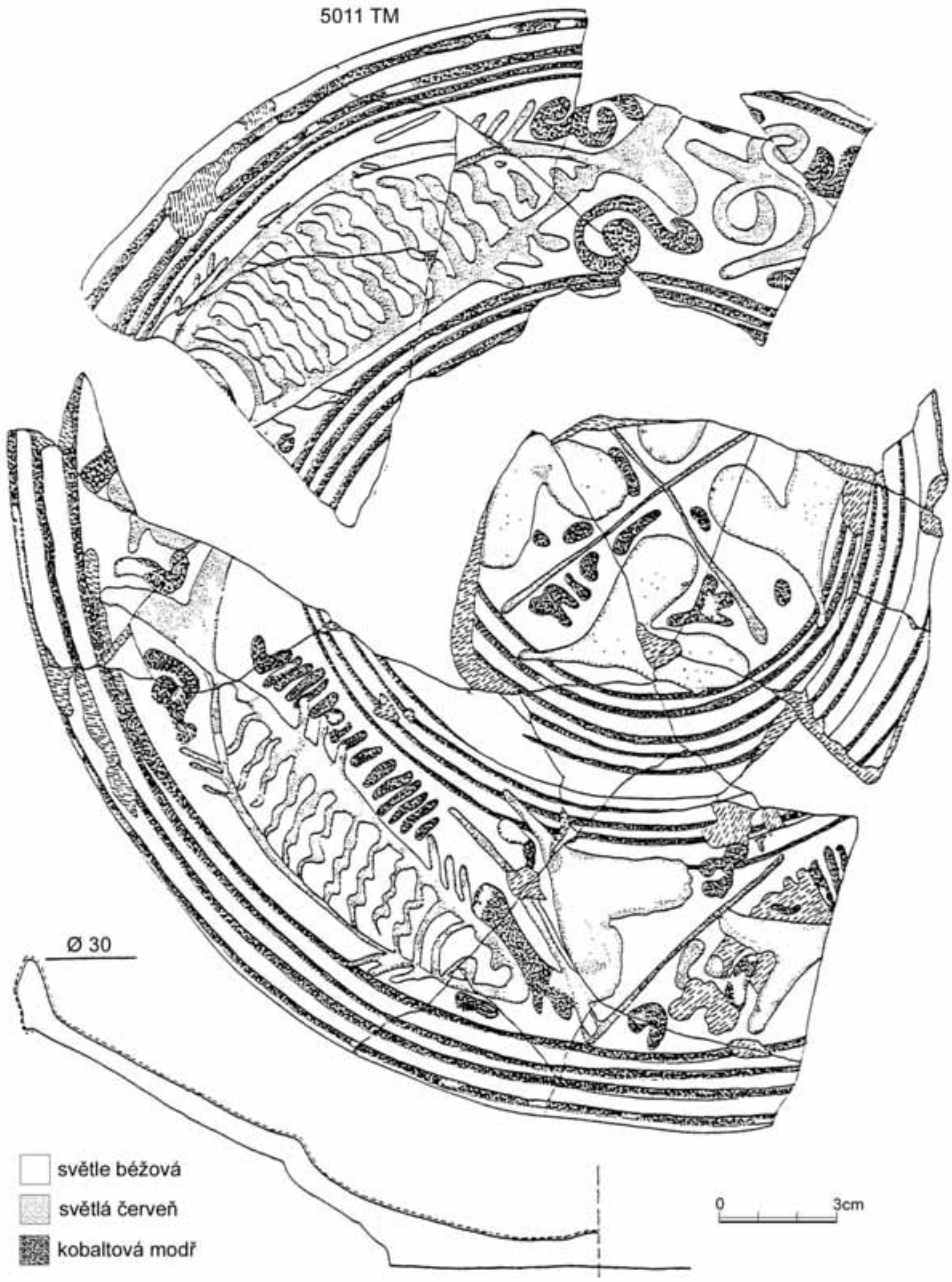


Fig. 13. Ceramic finds – sub-horizon A. White – light beige; light dotting – light red; dark dotting – cobalt blue.
Obr. 13. Nálezy keramiky – subhorizont A.

Among the finds, 25 pieces of rims could be identified, which belonged to deep bowls (*fig. 8: 5, 6*). In the majority of the cases, the rim was horizontally levelled. All of the identified fragments have inner glaze on a white engobe. Worth noting in more detail is the find of part of the rim of a deep Beroun-type ceramic bowl (ceramic class 5012 – *fig. 14: 3*). Part of its horizontally levelled rim survived, and on its upper surface part of the inscription RONIEM is preserved, executed in light fine clay. The inner and outer surfaces of the bowl were decorated with beige horizontal lines.

The find collection also includes two rim fragments of reduction fired goblets (ceramic classes 5002, 5003), which we regard as typical component of mediaeval pottery collections (*fig. 6: 3, 7*).

4.1.3 Technical ceramics – pharmaceutical vessels

Pharmaceutical vessels belong to the category of technical ceramics, which began to appear at the start of the Early Modern Age. They mainly include small shapes with wide bottom, conical body and a simple out-turned rim.

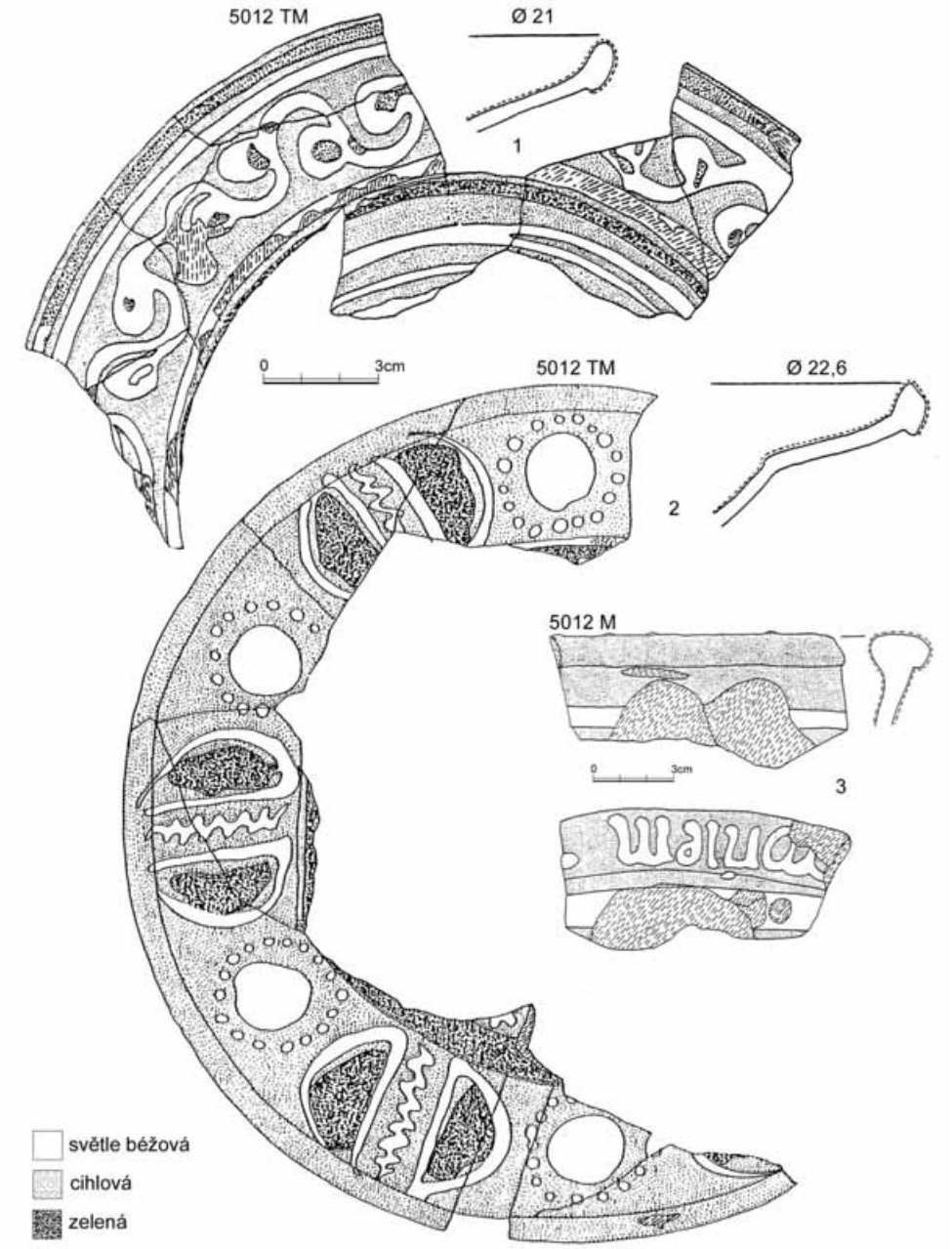


Fig. 14. Ceramic finds – sub-horizon A. White – light beige; light dotting – brick red; dark dotting – green.
Obr. 14. Nálezy keramiky – subhorizont A.

It is assumed that they were used to store various types of oils and ointments. Fragments of miniature pieces, which can be regarded as part of the pharmaceutical vessels, make up 0.8 % of the total finds, from which it was possible to reconstruct one complete shape (ceramic class 5004 – *fig. 16: 6*). The pharmaceutical vessels also included part of a bottom and a body of a majolica albarello[18]. The outer surface of the body was painted with cobalt-blue decorations in the form of short, slanted lines bordered on both sides with horizontal lines, followed above by minuscule decorations[19] (*fig. 18: 5*).

4.1.4 Fragments of unidentified shapes

In total, 2151 ceramic fragments of various sizes were found, for which it was not possible to identify the form they originated from. In the studied collection, these fragments make up 53.3 % of the total finds. Some of these are nonetheless worth noting. Among them is a fragment of a body with part of the lower neck of what was probably a jug (ceramic class 5007), the outer surface of which

Note 18:
This shape comes from the Orient. In the 15th, and especially the 16th and 17th centuries, it became widespread in Italy, where it became one of the most typical shapes used in pharmaceutical collections. These are primarily cylindrical majolica vessels, with a slightly narrowed shape at the centre, a wide neck, and an indented foot, sometimes slightly profiled. Lids were not used for these shapes, instead they were covered with rings of paper or parchment, which was fastened around the neck with string (*Kube 1976*, 10). In a walled cesspit in Lübeck, dated to the 15th-18th centuries, which belonged to the town hall pharmacy and contained pharmaceutical waste, there were three finds of albarello that originated in the Netherlands (*Meckseper 1985*, 655).
In the Czech lands, albarello began to appear with the products of the Anabaptists (*Braunová, 1985*, 414; *Pajer 2001*, 92).

Note 19:
We find decorations in cobalt blue on products coming from workshops in Venice dating to the 16th century (*Kube 1976*, tab. 26). Two albarellos, which are decorated with tiny plant motifs rendered in cobalt blue, form part of the collection of the museum in Faenza and they are said to have originated at the end of the 15th or the beginning of the 16th century (*Ronchetti1982*, slide 1/22).

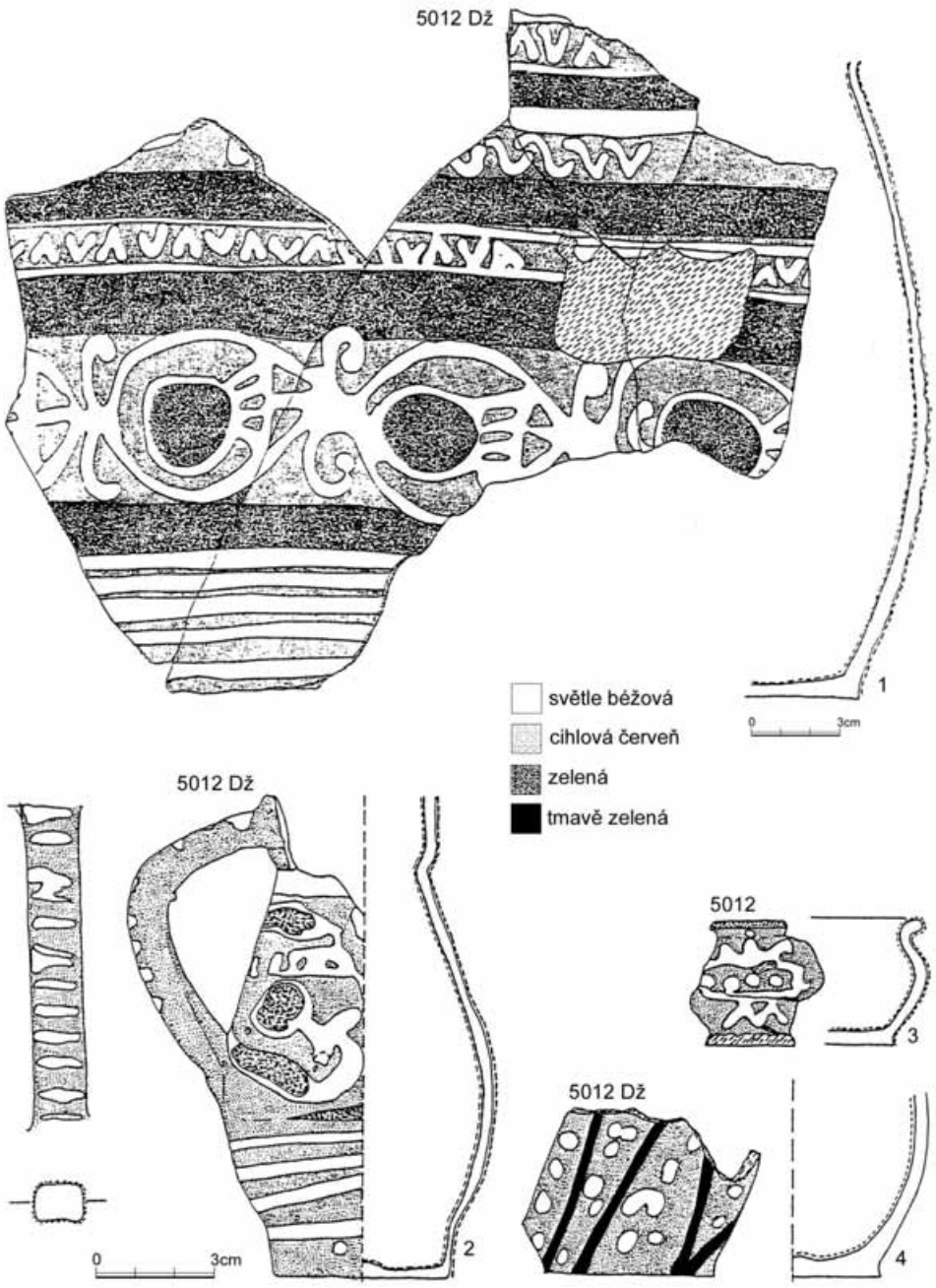


Fig. 15. Ceramic finds – sub-horizon A. White – light beige; light dotting – brick red; dark dotting – green; black – dark green.
Obr. 15. Nálezy keramiky – subhorizont A.

is decorated with raspberry-shaped prunts, positioned alternately in a sharp zigzag, two of which are green glazed and one yellow[20)] (*fig. 9: 7*).

In the entire collection, 30 pieces (0.9 %) of fragments were found of stoneware bodies, the shapes of which could not be determined. All the fragments are made of gently washed clay with an exterior surface covered with a brown salt glaze. The most interesting find is a fragment of a body with a wheel-pressed decoration and with figuration decoration in relief. Only part of the original motif has survived – the lower half of the body of Christ on the cross, with town walls in the background (*fig. 10: 6*). It is very probable that this was produced in Waldenburg in Saxony around the year 1570 (*Horschik 1978*, 106, Fig. 3). Another fragment of a body with a strips of wheel-pressed decoration, is also from the same Saxony workshop, evidently from the second half of the 16th century (*fig. 10: 8*; *Horschik 1978*, 107, Fig. 5).

Note 20:
This decorative motif comes from the Rhineland, but we also encounter it in Lower Austria in Enns, and in Hungary in Buda (*Holl – Parádi 1982*). Three small fragments with raspberry prunts were found during the excavations of the deserted village of Konůvky in Ždánický Forest (*Měchurová 1997*, tab. XL: 9). The same decorative technique was also applied on a fragment of what was probably a small goblet, which was found in cesspit B, unearthed in the direct vicinity of St. Vitus Basilica (in the processing stage).

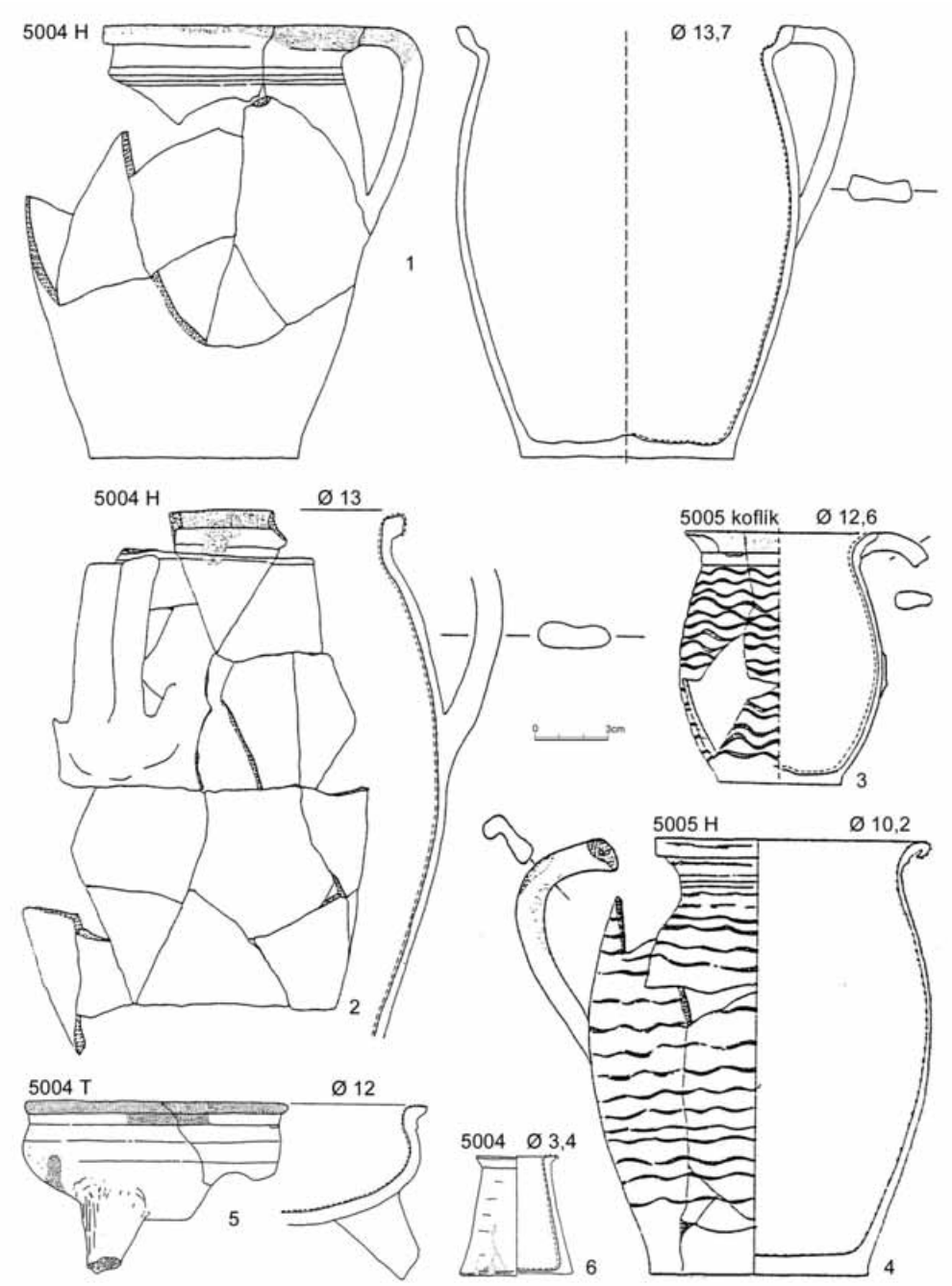


Fig. 16. Ceramic finds – sub-horizon A.
Obr. 16. Nálezy keramiky – subhorizont A.

4.2 Tiles

The largest set of finds is tiles, 6604 fragments of which were identified. With the exception of three fragments, all the finds come from the fills of the cellars (sub-horizon A, especially layer 691A – 82.1 %). All of these are tiles made of light yellowish-white to white firing clay, with a just a small amount of tiny siliceous grains. The tiles were first given a white engobe covered by a transparent green, lead glaze. The vast majority of the tiles in this collection have traces of sooting on the back of their front side – evidence of their having been set into functioning stoves. A large portion of the found tiles have a more or less evident imprint of a rough fabric on the back of a front side, which was typical for this period and is the result of the technique used to produce the tiles[21]. In terms of time, style, and technology, finds of tiles make up a homogenous collection, most of which dates to the second half of the 16th century.

Note 21:
For a description of the technique of producing Renaissance tiles, see *Dymek 1995*, Tab. XXXVII.

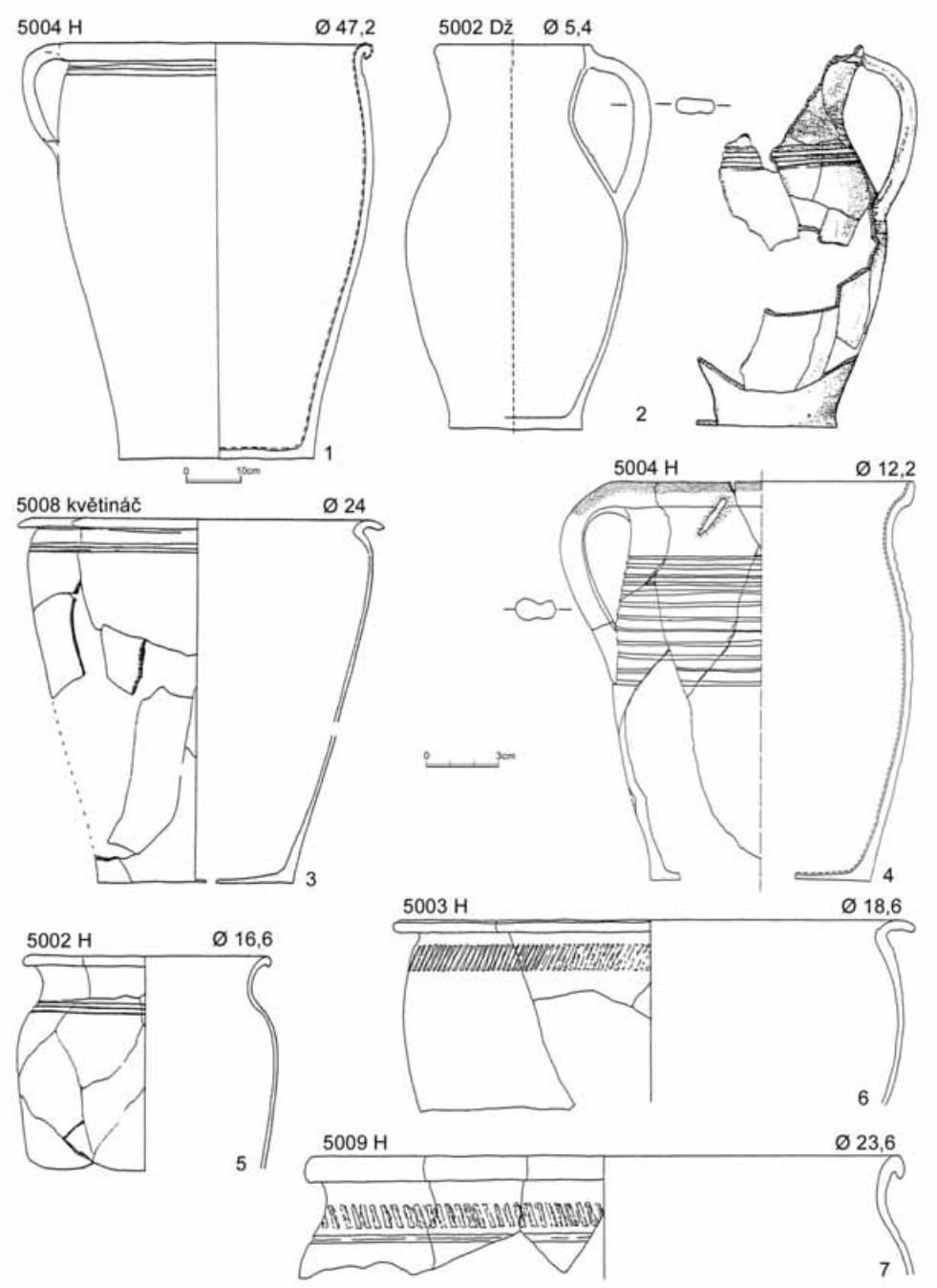


Fig. 17. Ceramic finds – sub-horizon A, B.
Obr. 17. Nálezy keramiky – subhorizont A, B.

Note 22:
Tiles with a similar type of relief at the front side are relatively common in the Czech lands. Individual finds vary only in terms of the specific plant motif used (e. g. *Durdík – Hazlbauer 1994*, fig. 9: 1; *Hazlbauer 2001*, fig. 6: 4, fig. 9: 1, 7, 9; *Pajer 1983*, fig. 44, 45, 49, 50).

Note 23:
This type of tile with transparent green glaze is already known from finds at Prague Castle, from the so-called Multifunctional hall (*Boháčová – Frolík – Žegklitz 1988*, fig. 1) and from Lobkowicz Palace (*Durdík – Frolík – Chotěbor 1999*, fig. 77: 2), and from Křivoklát (*Durdík – Hazlbauer 1994*, fig. 9: 3, 4). Similar tiles, with an unglazed front side, have also been found in a large number of other sites, for example, from the central Elbe River area (*Hazlbauer – Špaček 1986*, fig. 7: 1), Točník (*Hazlbauer 1988*, fig. 16: 3, 5) or from Nové Strašecí (*Hazlbauer 1989*, fig. 2: 10,11).

4.2.1 Basic row and corner tiles

The find collection is clearly predominated by tiles with a central bowl-shaped medallion, either square or rectangular in shape, dating to the second half of the 16th century (*Hazlbauer – Špaček 1986*, 157). Most of the finds are square tiles with a leafwork motif placed in the corners[22)]. The length of the sides of the tiles is 26.4 cm and they are 7.3 cm deep. There are at least 70 tiles of this type in the collection (*fig. 20: 1*). The second numerically large group of finds is made up of parts of rectangular tiles with a central bowl-shaped medallion, the front side of which is decorated in relief with a female and male figure (Atlas) and putto figures[23)] (*fig. 19: 1*). The height of these tiles is 29.1 cm, the width 18.5 cm, with a depth of 7 cm. There are at least 34 tiles of this type in the collection. It was also possible to identify at least three basic row rectangular tiles with a central bowl-shaped medallion, decorated in relief in the upper corners with two standing lions holding a festooned medallion with

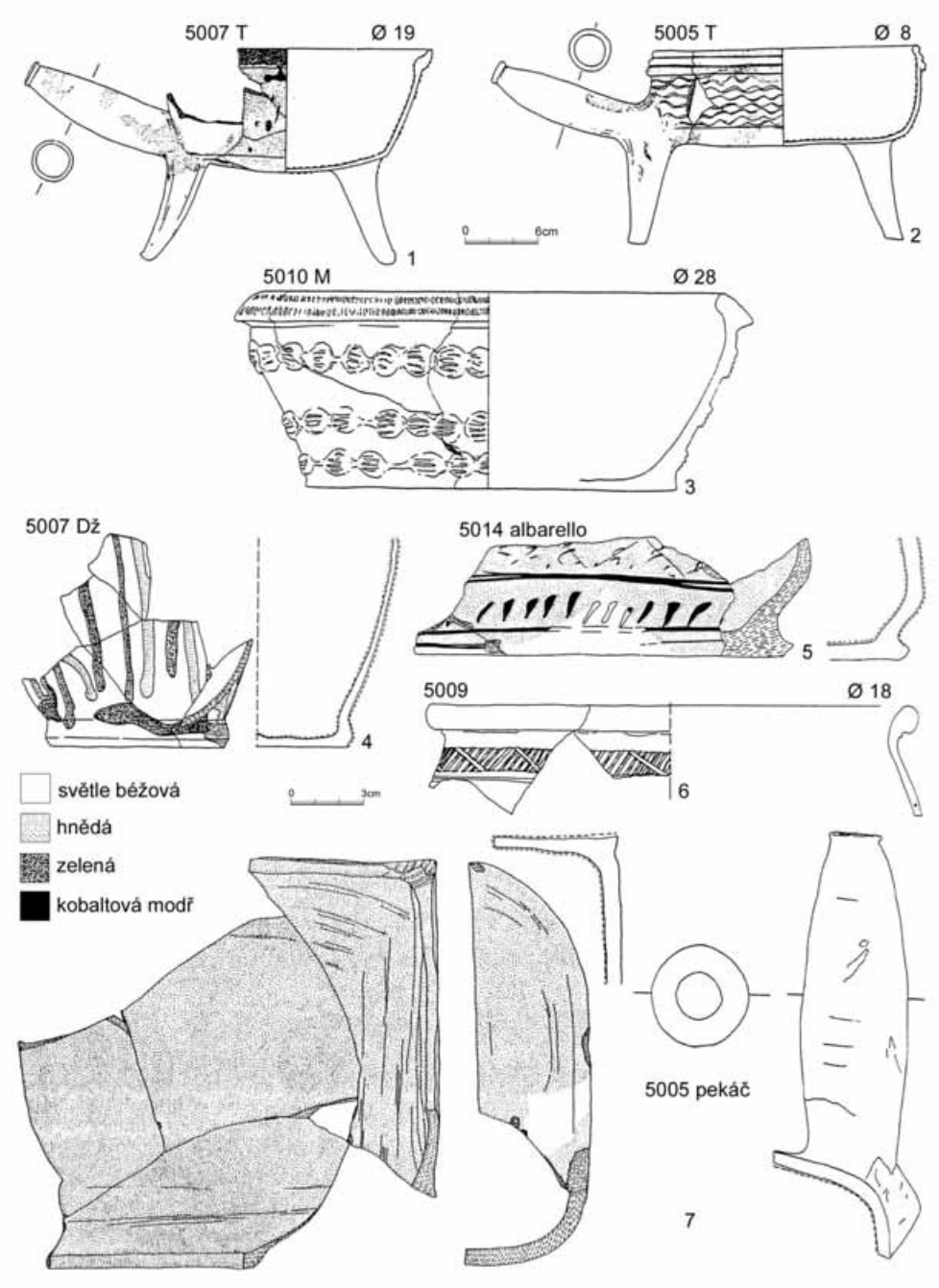


Fig. 18. Ceramic finds – sub-horizon A. White – light beige; light dotting – brown; dark dotting – green; black – cobalt blue.
Obr. 18. Nálezy keramiky – subhorizont A.

a lion's head. In the centre of the lower part there is a mascaron face, from which stylised Lily-of-the-Valley blossoms extend into both corners[24)] (*fig. 19: 2*). The height of the tiles is 28.9 cm, the width is 17 cm, and the depth is 7 cm.

The remaining five motifs depicted in relief on the front side of the tiles were found at one piece each. An uncommon find is a tile with the Biblical motif of Hagar being driven into the desert. Depicted in relief are the figures of Hagar and Ishmael, Abraham and Sarah with Isaac in her arms. All of them are dressed in Renaissance clothing, and there are palm leaves in the background. The entire scene is framed along the sides with pillars and half-columns and above with two horizontal rows of leafwork, which are separated by a strip of small squares[25)] in relief (*fig. 19: 3*). Unlike the previous tiles, which had a shallow, frame chamber, the tile has a conical chamber with a circular rim in the shape of a lightly grooved collar. The height of the front side is 19 cm, the width is also 19 cm, and the depth is 13.7 cm. The tiles with this theme are dated to around the middle of the 16th century.

Note 24:
An analogy of this tile, but in unglazed form, originates from Nové Strašecí (*Hazlbauer – Špaček 1986*, fig. 7: 1).

Note 25:
From analogies, we know of a green glazed fragment of a tile (*Strauss 1972*, Taf. 89: 4) and two coloured-glaze specimens from central Germany (*Franz 1969*, 212), and from workshops in Cologne (*Strauss 1972*, 116: 2).

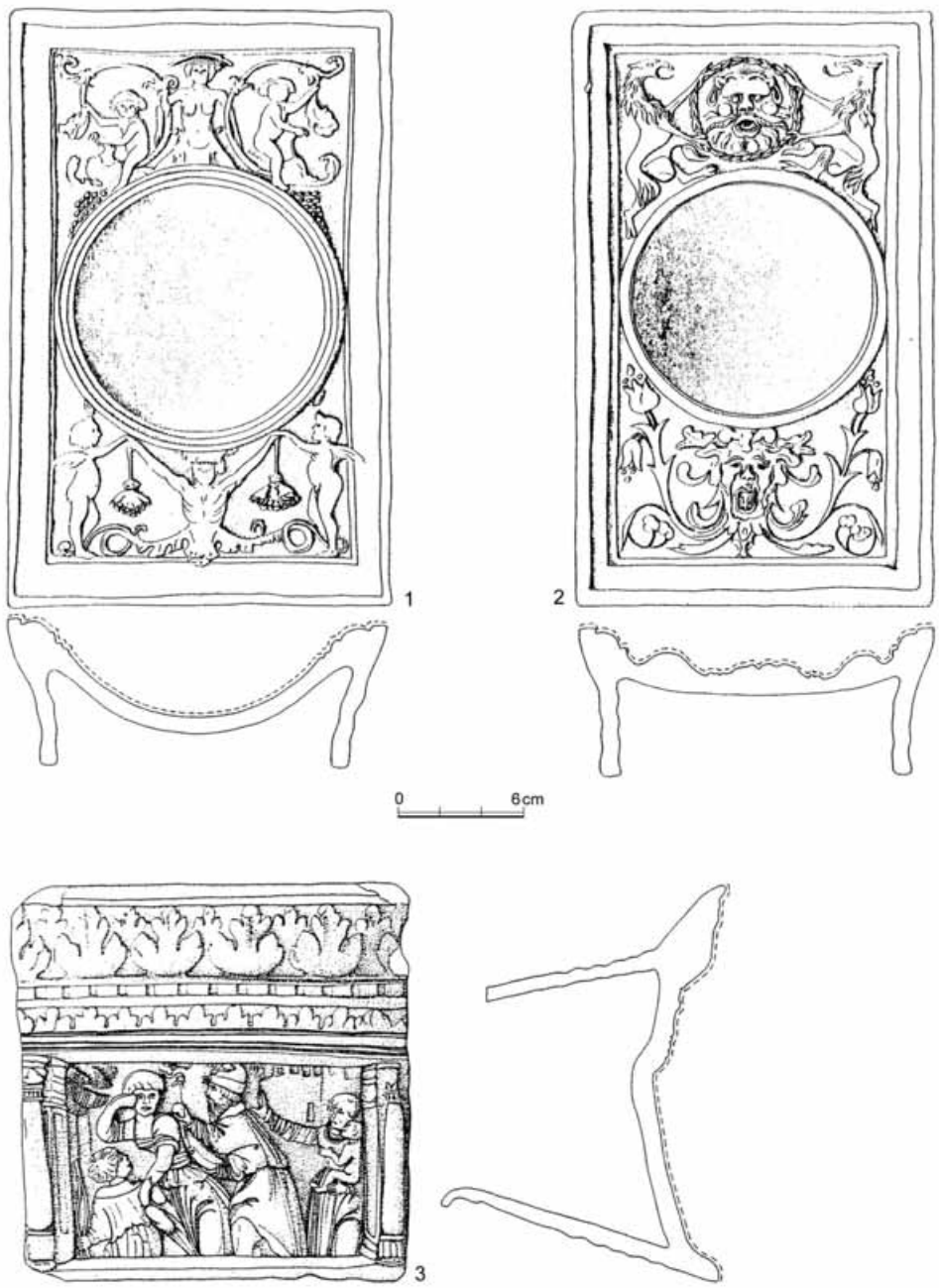


Fig. 19. Tile finds – sub-horizon A.
Obr. 19. Nálezy kachlů – subhorizont A.

In one example, part of a row chamber tile with a rectangular shape was found, with the motif of a griffin lying down, with its head raised and its tongue sticking out, surrounded by a triple moulding[26)] (*fig. 21: 3*). Also found in fragmented form was part of an originally dual-portrait, so-called noble tile. This is a chamber, mantel, crown-type (?) row tile with the left profile of the half figure of a noblewoman. The woman is wearing a Renaissance dress with puffed sleeves, on her head a beret with three feathers, and jewels around her neck. The relief is bordered on the outside with half of a polygonal pillar and half-column, and the lower edge is made up of a twisted rod[27)] (*fig. 21: 4*). Like in the case of the tile with the griffin motif, the heating chamber did not survive.

A separate part of the collection is made up of finds of so-called mosaic tiles. Two related varieties of relief decoration of their front sides were discovered. This is a combination of an S-shaped limbs, which divides the embossed front side into separate fields, which are filled with a trefoil on a stem. A total of 21 fragments were found with a transparent green glaze and one entire mosaic

Note 26:
There is an analogical find dated to the first half of the 16th century from a workshop in Nuremberg (*Franz 1969*, 205).

Note 27:
Double-portrait tiles were a very common and a widespread type of tile, which is evident not just from the large number of finds from various locations in Prague, for example, from the Na valech Gardens below Prague Castle, and from Lobkowicz Palace, Ungelt, and Jungmann Square (*Brych – Stehlíková – Žegklitz 1990*, cat. no. 202-7, 220; *Durdík – Frolík – Chotěbor 1999*, fig. 75: 2; *Richterová 1982*, 62: 1-3), but also from the various types of modifications of the front sides of a tile, ranging from an unglazed surface to single- or multi-coloured glazes.

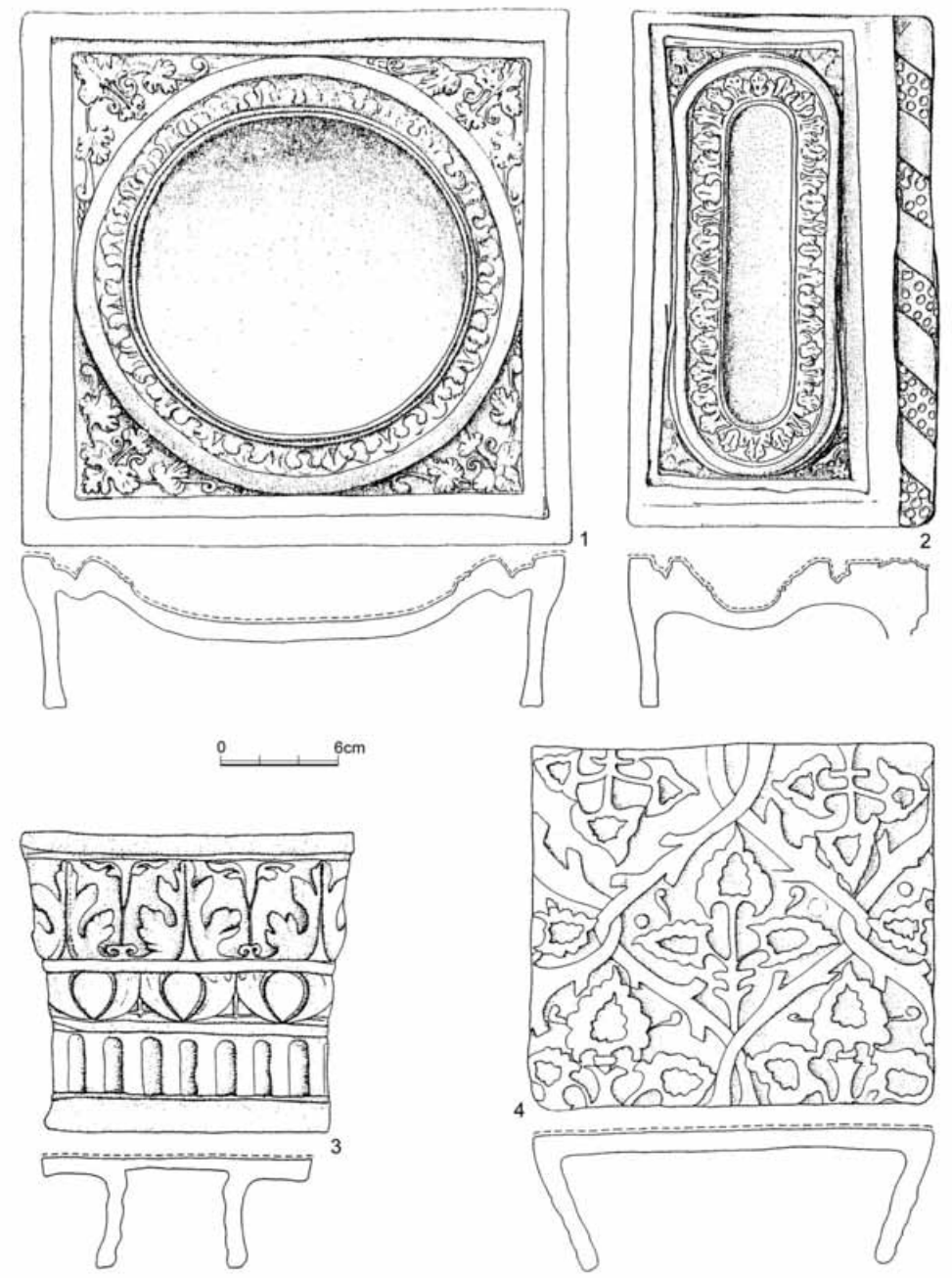


Fig. 20. Tile finds – sub-horizon A.
Obr. 20. Nálezy kachlů – subhorizont A.

tile done in a yellow-white base colour combined with blue, green, and brown colours (*fig. 20: 4*). The chamber of this tile is low, framed, and with a suggestion of a conical closing. The rim of the chamber is oval-shaped on the outside, and on the walls of the chamber there is distinctive grooving. The length of the side is 21.5 cm, and the depth is 7 cm.

The find collection contains a single variant of a basic, corner tile. This is an asymmetrical tile with a rectangular shape and with a central oval-shaped medallion, bordered with a leafwork motif. In the free corners of the side wall there is a stylised motif of a leaf with shoots. The corner moulding is decorated with embossed twisting (*fig. 20: 2*).

4.2.2 Mantel tiles

As with the basic tiles, several different shapes of mantel tiles were discovered. It can generally be summarised for these tiles that all the types and variants discovered date to the broader period of the 16th century (*Brych – Stehlíková – Žegklitz 1990*, cat. no. 355, 363, 365).

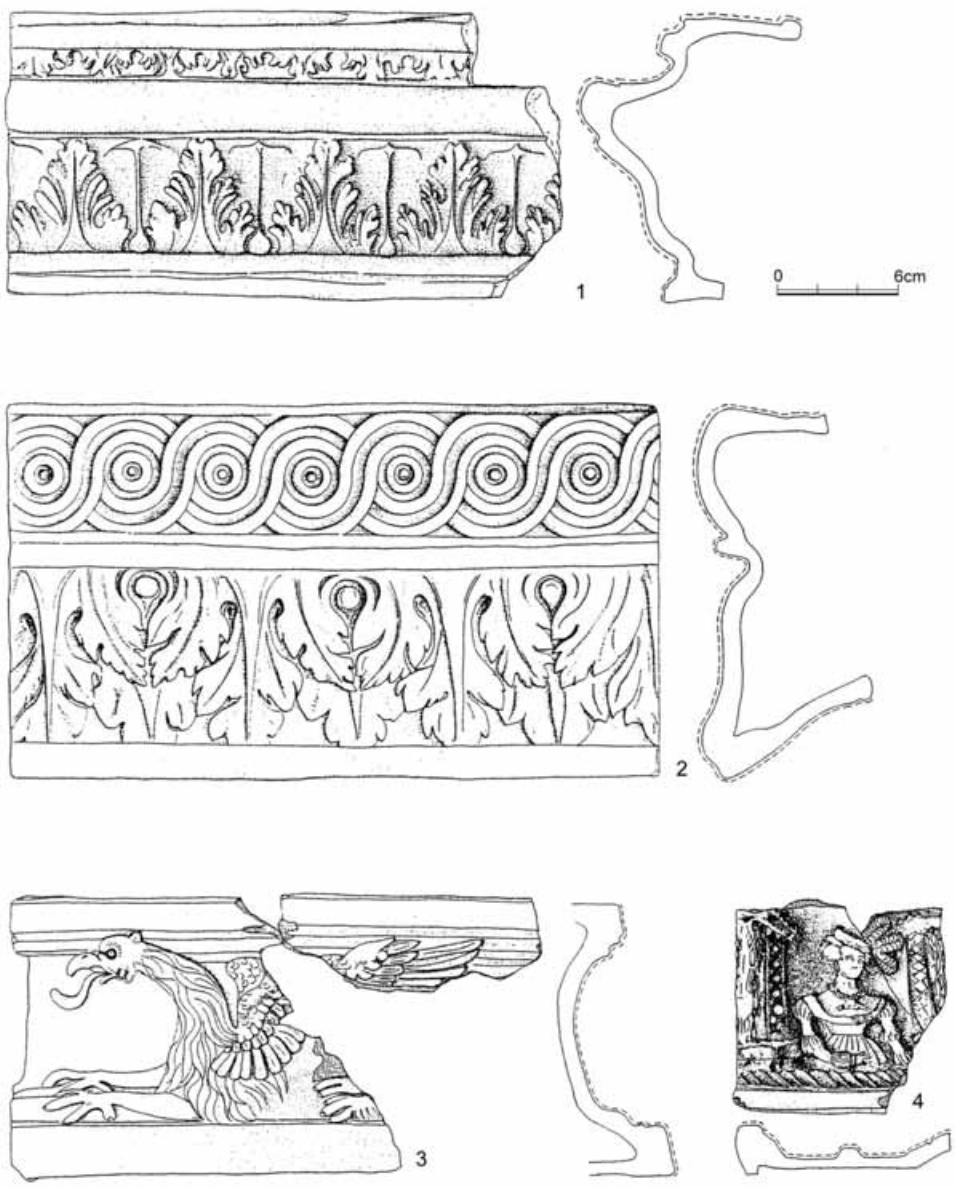


Fig. 21. Tile finds – sub-horizon A.
Obr. 21. Nálezy kachlů – subhorizont A.

A horizontally divided tile, decorated with leaves and unrollings, is an example of a mantel, base (?), row and corner tile (*fig. 21: 1*). Another type of mantel tile again survived in both a row and corner version. This is probably a chamber crown-type tile, the embossed front side of which is divided up and bordered with horizontal mouldings. In the upper part, there is a fret motif, in the lower part there is lobedly moulded leafwork. The two parts of different size are separated by a distinctive recess (*fig. 21: 2*). The collection contains at least seven pieces of both mantel crown-type tiles and base tiles.

One piece of a mantel tile survived, the front side of which bears an isosceles trapezoid that is divided into strips by horizontal grooving. The upper part contains a leafwork motif, the centre contains the motif of an astragal, and the lower part contains short, vertical flutes[28)] (*fig. 20: 3*). Only several fragments come from the latest type of mantel, crown-type, corner (?) tile, the overall shape of which cannot be accurately reconstructed. As in the previous case, the embossed front side is divided up by horizontal grooving into strips, and again, with just a subtle variation in style, the alternating motifs of leafwork, astragal, and short, vertical flutes repeats.

Note 28:
In addition to finds from Prague, these tiles have also been observed in the finds collections from the central Elbe River area (*Zápotocký 1979*, tab. 75: 3), in Nové Strašecí (*Hazlbauer – Špaček 1986*, fig. 3: 5), and even in Moravia in Ivančice (*Šebela – Vaněk 1985*, tab. 34: 3).

4.2.3 Acroterium

It was possible to uncover in the find collection several fragments belonging to a mantel apex, a so-called acroterium. In the first case, there were a pair of opposing acanthus leaf decorations, supporting a bowl, above which is the figure of a standing shield-bearer in Renaissance attire, who in his left hand holds a divided shield. Putto figures are seated on both sides of the acanthus leaves. The second case involves a pair of sets of decorative acanthus leaves, supporting a bowl, out of which a stylised blossoming plant is growing[29]. The last building element of the tile stoves present in the collection is a top chapiter.

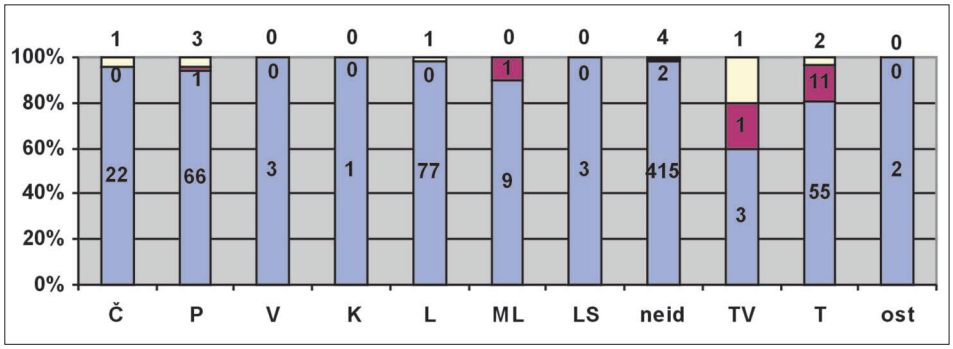
4.2.4 Summary

Stove tiles unearthed may come from a stove, the base part of which was made of square tiles with a bowl-shaped medallion, and the upper part was made of rectangular tiles[30] (*Pajer 1983*, fig. 64). Unfortunately, based on the situation uncovered, we are unable to decide whether the assumed tile stove comes directly from the house in whose cellar it was found, or whether it stood somewhere else on the grounds of Prague Castle. The amount of square tiles with a bowl-shaped medallion (at least 70 tiles) suggests that these may actually be the remains of two stoves. In any case, it is possible to consider the several fragments of mosaic tiles as belonging to a different tile stove.

4.3 Glass[31]

In all three sub-horizons together, 685 fragments of glass were found, of which 610 were fragments of hollow glass (89.1 %). The material was mostly fragmental, indicating the quantitative proportions of finds found and providing an opportunity for a statistical overview (*graph 4*). The largest group of glass finds was discovered in sub-horizon A – 657 pieces (95.9 %), with 60 % of finds coming from layers 677 and 755. No chemical analyses were performed that could have determined the composition of the individual types of glass material. The glass finds were therefore evaluated only on the basis of macroscopic observations. All the finds were made of transparent glass, the vast majority in a light green shade, typical for potassium lime glass produced in Central European glassworks. Due to the decoration and shapes of products it can be said that the finds correspond to trends in Czech Renaissance glassmaking from the second half of the 16th to the first third of the 17th century.

The collection contained 23 fragments of beakers – large beakers, small beakers, and slightly conical beakers. The vast majority of them are from large beakers on a bell-shaped foot[32] (19 pieces – *fig. 22: 9*), two are from small beakers



Note 29:
From the grounds of Prague Castle, we know of these two acroteria found – better-preserved – in an archaeological excavation in Na valech Gardens in 1986 (*Brych – Stehlíková – Žegklitz 1990*, cat. no. 400) and from Lobkovic Palace (*Durdík – Frolík – Chotěbor 1999*, fig. 75: 1).

Note 30:
This type of tile stove is assumed to have become widespread in the second half of the 16th century (*Hazlbauer – Špaček 1986*, 157).

Note 31:
I am grateful to my colleague Jana Veselá for her extensive help in processing the glass finds.

Note 32:
Large beakers are found in the majority of collections of Early Modern glass, in Olomouc (*Sedláčková 1998*, 69, 71, 85-7), in Nymburk (*Sedláčková 1997*, no. 1), and in Pilsen. There are finds from Prague of undecorated large beakers from Lichtenstein Palace on Malostranské Square (*Podliska 2003*, 26) and from Prague Castle (*Veselá 2003*, tab. 1).

Graph 4. An overview of the fragments of particular glass shapes in the sub-horizons. Yellow – sub-horizon C; red – sub-horizon B; blue – sub-horizon A. Č – beaker; P – goblet; V – lid; K – tanhard; L – bottle; ML – small bottle; LS – laboratory glass; neid – unclassifiable glass; TV – triangular pane; T – window disc; ost – other glass.
Graf 4. Přehled zlomků jednotlivých skleněných tvarů v rámci subhorizontů. Žlutá – subhorizont C; červená – subhorizont B; modrá – subhorizont A. Č – číše; P – pohár; V – víko; K – konvice; L – láhev; ML – lahvička; LS – laboratorní sklo; neid – nezařaditelné sklo; TV – trojúhelníková výplň; T – okenní terčík; ost – ostatní sklo.

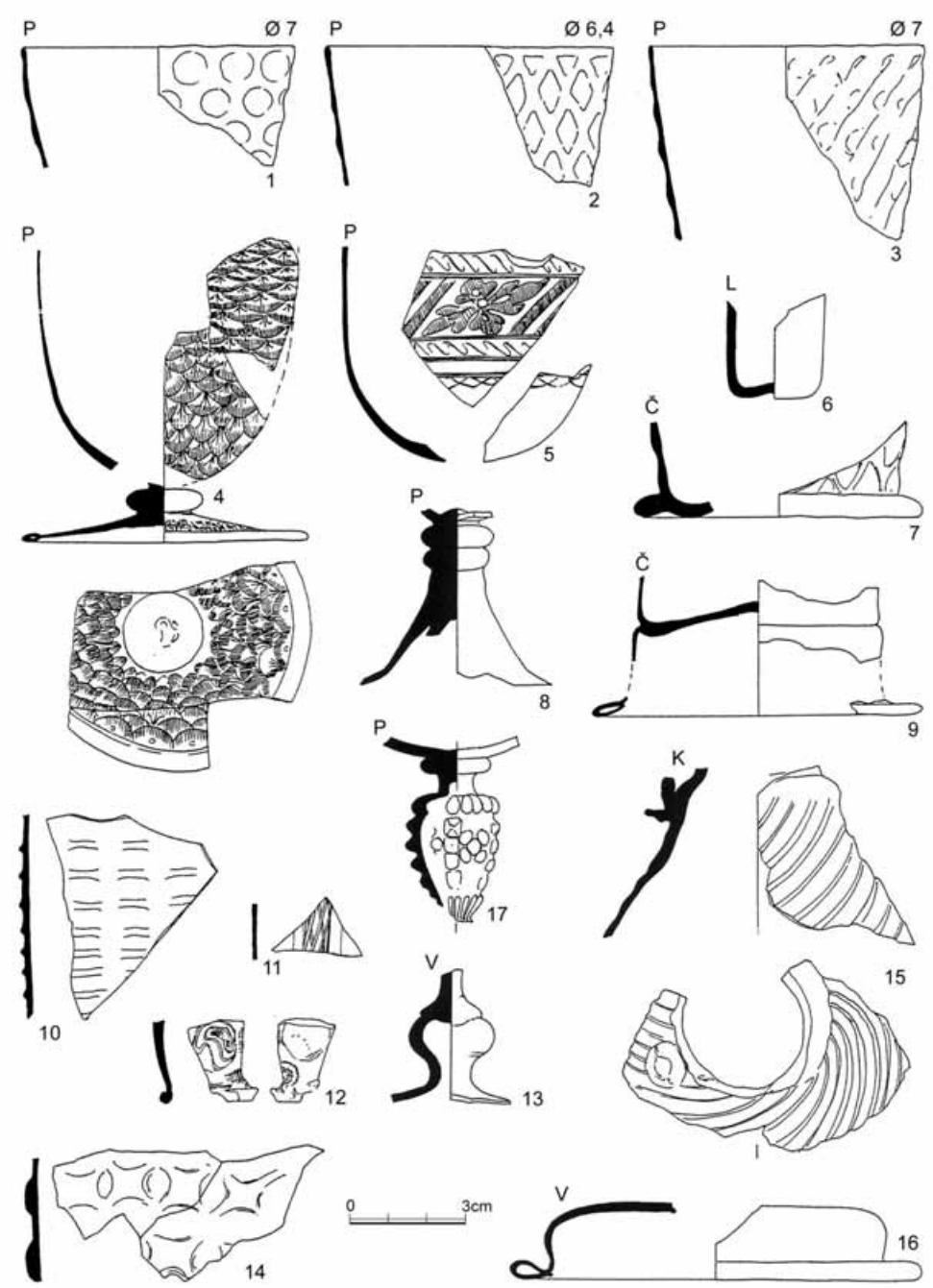


Fig. 22. Glass finds – sub-horizon A, B, C. P – goblet; Č – beaker; K – tankard; V – lid.
Obr. 22. Nálezy skla – subhorizont A, B, C. P – pohár; Č – číše; K – konvice; V – víko.

with optical decorations[33)] (*fig. 22: 7*), and the remaining fragments are from beaker with an applied fibre – so-called *wafelmuster* (*fig. 22: 14*).

A total of 36.0 % of the finds belong to goblets, some with a semi-ovoid bowl and some with a fusiform bowl. Most goblets were decorated with ribbed optical decorations, impressed or embossed rhombuses, and lentil patterns (*fig. 22: 1-3*). A more interesting find was a goblet with a semi-ovoid bowl on a low foot with a single ringlet where not just the entire bowl, but also the foot is covered with a thick and very carefully rendered engraved decoration. This involves the motif of fish scales, which is well known from Italian enameled works from the beginning of the 16th century (*Lanmon – Whitenhouse 1993*, 38-45). There is no other known analogy of this motif in Czech production (*fig. 22: 4*). Decorations engraved with diamond were used even on a bowl with a stylised flower motif (*fig. 22: 5*). In addition to fragments of goblet bowls, it was also possible to identify several different models of feet. The largest group was made up of stem

Note 33:
There are whole or reconstructible shapes from Prague Castle (*Veselá 2003*, tab. 1), Nymburk (*Sedláčková 1997*, cat. no. 5, 7-9), Olomouc (*Sedláčková ed. 1998*, cat. no. 17.2-12), Opava (*Štěrbová – Pavelčík 1997*, fig. 5: 1), and Strachotín (*Sedláčková 2002*, cat. no. 167).

with full double ringlets and a bell-shaped base (*fig. 22: 8*). In layer 691A, part of a foot was found that was blown into a mould with the motif of plant shoots[34)] (*fig. 22: 17*).

Most of the identified fragments were from glass bottles (88 pieces). Just less than two-thirds of the finds were fragments of tatrahedral bottles (*fig. 22: 10*). Miniature bottles made up 10 % (*fig. 22: 6*), and the remainder were fragments of oval bottles or parts of bottles that could not be determined in detail. Two fragments come from a lid (*fig. 22: 13, 16*), and also identified was a fragment of the lower neck of an tankard decorated with an optical decoration of slanted ribbing (*fig. 22: 15*). Three fragments of laboratory glass were found in the collection. In the first case, one fragment is probably part of a distilling apparatus, the second case represents two fragments of a low cylindrical small bowl[35)], made of a transparent, light-grey glass.

A total of 69.0 % of the collection of glass is made up of finds that cannot be categorised as belonging to a particular shape. However, these fragments are of significance in terms of their number and in several cases they fill in the spectrum of decorations used. On two fragments a decoration painted in enamel was discovered. Also found was a fragment of filigree glass (*fig. 22: 11*), where a filigree decoration was used in combination of *vetro a fili* with *vetro a retorti* (*Henkes 1994*, 170). What can be regarded as a more unusual find is a fragment, evidently of a beaker made using the technique of *millefiori* (*Ricke 1995*, K. 126; *fig. 22: 12*).

90.7 % of the finds of window glass (75 pieces altogether) were from widow discs with a folded-over rim. In sub-horizons A and B there were two finds of window discs with traces of a fire. Only five fragments come from a triangular window panel. The relative proportion of window glass to hollow glass is 1 : 17.

Note 34:
The massive nodes with decoration in relief are among the types of glass produced in Venetian style (*Sedláčková 1997*, 25). From the collection of Renaissance glass from Prague Castle, this is the first find with this motif (personal communication by J. Veselá).

Note 35:
They have been identified, in larger numbers, mainly in Prague (*Podliska 2003*, 29; *Veselá 2003*, tab. 2), but they have also been found in Moravia (*Sedláčková 2003*, 44).

4.4 Osteologic material

A collection of animal bones from all three sub-horizons was submitted for an osteologic analysis. In total 2451 bones were analysed[36)], of which 914 pieces were identified (37 %).

The results of the analysis indicated the presence of a relatively large proportion of cattle (183 of the identified bones) and sheep and goats (158 of the identified bones). In most cases, from the butchery point of view, the bones were from the valuable parts of the animals and they often bear marks of knives or other sharp instruments. A total of 191 of the identified bones come from domestic fowl and geese. The preliminary analysis did not include a full analysis of bird bones, the proportion of which was unusually high. The list also includes a find of dog bones, which evidently came from a single animal. In addition to the above-mentioned types, the collection also contained some not too numerous finds of game (deer, roebuck, partridge, hare) and fish.

Especially worth noting is the find of three bones identified as coming from a wild turkey (*Meleagris gallopavo*), which came from fill layer 683. This is one of the oldest finds of turkey bones in the Czech lands recorded in findings of osteologic material from the Early Modern Age.

Note 36:
The analysis was carried out by ARCHEOS, the unit for archaeology and ancient monuments (*Šamata –Kováčiková 2001*).

4.5 Coins

Note 37:
A numismatic assessment was carried out by J. Militký (*Militký 2001*).

Eleven coins were found in the studied part of the excavation, two jettons and several small fragments of unidentifiable coins[37]. Five coins were found in the fill of the well (sub-horizon B). The latest of the identifiable coins was a white coin from the time of the reign of Ferdinand I, Holy Roman Emperor (1526-1564), which was found in the upper part of the fill of the well (layer 794). The second, historically earlier coin, having a value of a haler, from the period of the reign of Ludwig Jagello (1516-1526), came from the lower layer no. 800. In the case of the remaining three coins, we unfortunately have no more precise idea about when they were minted. One is a coin minted in Silesian Vratislav (layer 796), another a coin of the Salzburg archbishopric under John II (layer 797), and a coin of Saxon origin, but from which mint it originates is unknown (layer 795).

The coins found in the fill of the cellars (sub-horizon A) date over a relatively long time span. In it were found coins minted in Kutná Hora under the reign of Vladislav II Jagello (1471-1516), Ludwig Jagello (1516-1526), Ferdinand I (1526-1564), and Maxmilian II (1564-1576). In layers 690 and 754, two pfennigs were found from Meissen in Saxony. Both jettons (layer 682 and a collecting from layers 688, 679, 668A, 681, 742) come from Nuremberg, and they originated at the end of the 16th and start of the 17th centuries. The chronological distribution of individual coin finds does not correspond to their stratigraphic position.

4.6 Minor finds

The list of minor finds is neither very long nor very diverse. The vast majority of these finds come from the fill of the cellars (sub-horizon A) and only three ones were found in the fill of the well (sub-horizon B, layer 799). The find collection of minor finds can be divided into four basic groups according to the material used to produce them. The largest part comprises products made of bronze, followed by objects made out of bones, technical accessories made of lead, and worked antler. It can generally be summed up that these are objects that have no clear chronological signs and they occur continuously.

There were several buttons made of bronze, consisting of two hemispheres, three small bronze strips from leather strap, part of a triangular-shaped bronze strip, three bronze circular-shaped cases, originally from a thin metal strip rolled into a tube, a wound fine wire, and numerous small pins. We do not know what the function was of one bronze object in the shape of a miniature spur (*fig. 23: 12*). Two bronze pins, appliqué in the form of a moulded bouquet, and finally a slightly wrought thimble (*fig. 23: 20*) were found in sub-horizon B.

The second group contains four objects made of bone material. First, there is part of the facing of a knife handle, broken into four pieces (*fig. 23: 18*). A related find is an entire short bone handle, probably from a cutlery knife, with two rivets with a long six-angled profile (*fig. 23: 17*). An uncommon find is that of a composite button made of bone and formed out of two parts fitting together and thus forming a cone. The outer surface of the button is decorated with engraved, concentric circles. A fine wire runs through the entire height of the button, which on one side evidently terminated in an eye that was used to sew the button onto clothing (*fig. 23: 19*). The last bone-material find is a classic

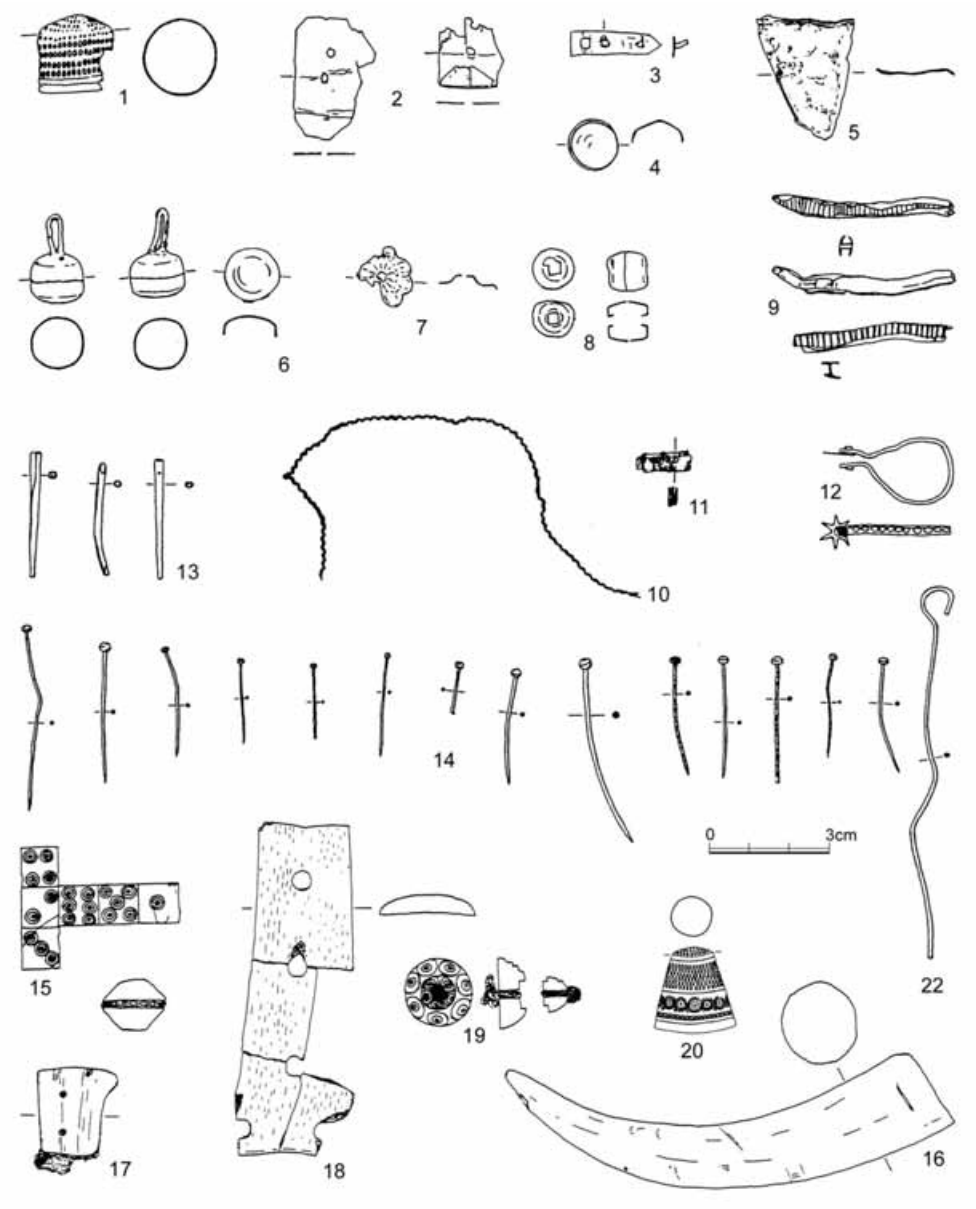


Fig. 23. Finds of small objects – sub-horizon A, B.
Obr. 23. Nálezy drobných předmětů – subhoriznont A, B.

six-sided playing dice. The individual points of the six numbers are depicted with three concentric circles (*fig. 23: 15*).

The group of finds is rounded out by two finds of part of a lead bonding for a window pane in the shape of the letter "H" with grating inside (*fig. 23: 9*).

5. Conclusion

What we have learned from the archaeological excavation and their subsequent analysis can be divided into two separate units, but we cannot clearly define the relationship between them. The first unit is formed by the walled cellars, the second represents their fill. From the analysis of the fill of the cellars, it can be assumed that the house of the armoury scribe did not cease to exist after some unfortunate accident or fire, but that it was a planned and prepared demolition of the building, which was already deserted at the time of Wohlmut's Plan. There are several reasons for this claim. At first, there is an absence of any noticeable and omnipresent fire layer and generally the minor presence of fire traces on particular finds. This also agrees with the relatively

small proportion of window glass in the collection. The version of subsequent filling of the cellars is supported by the partial disassembling of the Gothic portal between the cellars. The quick and relatively rapid one-off filling of the empty areas, which occurred by the breaking up of the vault of the cellars, was proved in a laboratory analysis of the finds, where – in several cases – fragments from one vessel were found in different, sometimes relatively remotely situated, layers. Evidence that the cellars were filled over a short period of time is also found in the finds of coins, the stratigraphic positions of which – although they range in date from between the third quarter of the 15th century to the start of the 17th century – do not correspond chronologically.

A comparison of the layout of the archaeologically excavated cellars and both historical plans of Jiřské Square indicates that very probably the described cellars were genuinely part of the house of the armoury scribe. Unfortunately, the field context does not allow us to say anything more about life in this house. An evaluation of the finds showed that even on a site like Prague Castle, objects known also from other urban sites were used on a large scale. We can also state that common goods considerably outnumber luxury items, which were often imported from other parts of Europe. However, we must bear in mind the fact that of each of the particular types of finds, at least one object that has no analogy in the Czech lands as yet was uncovered.

To conclude, we can say that – based on written sources and a general dating of the varying sorts of archaeological finds – it is estimated that the cellars of the house of the armoury scribe were filled in the second half of the 16th century, more precisely, probably after the third quarter of the century.

Resumé:

Součástí plánované rekonstrukce Jiřského náměstí na Pražském hradě byl v letech 1984-1989 předstihový záchranný archeologický výzkum, který se v roce 1987 soustředil do prostoru severovýchodní části náměstí.

V rámci zkoumané plochy byly objeveny dvě nestejně velké zasypané sklepní prostory, vymezené na maltu zděnými opukovými zdmi, původně sklenutými valenou klenbou (*obr. 1*). Oba sklepy byly původně spojeny dveřním otvorem, ze kterého se zachoval práh a pozdně gotické ostění dveří (*obr.2*). Menší z obou sklepů byl rozdělen na dvě části. Přibližně v jeho polovině byla zachycena terénní deprese obdélníkového půdorysu se zbytky dřeva, kterou je možné interpretovat jako základ pro schody, spojující sklepy s obytným patrem domu (*Boháčová – Frolík – Žegklitz 1989*, 199). Pod úrovní vrstvy 785 ve východním rohu menšího sklepa byla zjištěna kameny obezděná, 2,40 m hluboká studna, nepříliš nálezově bohatá. Větší ze sklepů se do původního terénu zahluboval výrazněji a byl vyplněn vrstvami charakteru stavební suti.

Možnost poznání celkové situace zkoumaných sklepů byla výrazně omezena skutečností, že při zarovnávacích pracích na Jiřském náměstí došlo v minulosti ke snížení jeho okolních terénů. Podle zjištěné půdorysné dispozice byly zkoumané sklepy pravděpodobně součástí dvouprostorového, podsklepeného, jednopatrového domu. Studna, objevená v menším sklepě, zřejmě sloužila jako cisterna na vodu.

Již autoři výzkumu ztotožnili popisované sklepy s domem zbrojního písaře. Při této úvaze vycházeli z tzv. Wohlmutova plánu Pražského hradu, datovaného do období kolem roku 1569. Na tomto plánu je ve východním rohu Jiřského náměstí zakreslen zřejmě již pustý dům zbrojního písaře – *des zugschreiber losement*. Bezprostředně k tomuto domu, jižním směrem do náměstí, je přisazen dům, který má být zbořen – *dis hause sol (zum) weg kommen* (*obr. 5*).

Na základě rozboru statigrafické situace se domnívám, že s výjimkou vrstev, které leží těsně nad podložím (798, 806, 808, 808A), není možné jednoznačně spojit nalezené artefakty s obdobím fungování domu. Nálezy pocházející ze zásypových vrstev jsou tedy považovány za druhotně přemístěný materiál. Pro následující zpracování jednotlivých

nálezů byly vytvořeny celkem tři subhorizonty: subhorizont A – zásyp obou sklepů; subhorizont B – zásyp studny; subhorizont C – podlahové vrstvy obou sklepů.

Při zpracování souboru keramiky bylo na základě makroskopicky postižitelných technologických vlastností definováno 14 keramických tříd pro novověkou keramiku a jedna pro středověkou (Tab. 1). Při vyhodnocování nálezových souborů z jednotlivých subhorizontů nebyla zjištěna žádná hranice, která by naznačila chronologický odstup mezi nimi. V souboru převažoval střepový materiál, rekonstruovaných tvarů bylo pouze 17. Statisticky jednoznačně nejpřesvědčivější vypovídací hodnotu poskytly nálezy, pocházející ze zásypu sklepů (3 261 kusů). Zde převládaly nálezy světle se pálící keramiky s vnitřní glazurou (keramická třída 5004 – 49 %). Druhou nálezově nejpočetnější keramickou třídou byla cihlově červeně se pálící hlína s vnitřní glazurou (keramická třída 5005 – 17,5 %). Zástupců ostatních tříd bylo méně než 5,0 % (*graf 1 a 2*). Z hlediska technologického zpracování můžeme keramický soubor rozdělit na čtyři skupiny. První a nejpočetnější skupinu tvoří nálezy redukčně nebo oxidačně pálené keramiky, vyrobené z jemně plavené hlíny, určené pro modelaci tenkostěnných nádob. Ve druhé skupině jsou zastoupeny zlomky kameninových nádob. Třetí technologickou skupinu představuje jediný nález majolikového albarella. Poslední, čtvrtou skupinu tvoří několik zlomků středověké keramiky. Za samostatnou podskupinu je možné považovat keramiku tzv. berounského typu (keramická třída 5012).

74,3 % určitelných střepů náleží hrncům (*graf 3*). U jedinců, u kterých se podařilo rekonstruovat celý průběh těla, převažuje štíhlejší vejčitý tvar s největší výdutí kolem horní třetiny výšky nádoby. Mezi okraji byla zjištěna převaha ovalených okrajů a lištovaného okruží. Dále se můžeme setkat s přehnutým, vodorovně vyloženým, vzhůru vytaženým nebo esovitě profilovaným okrajem. Na základě poměrně četných fragmentů uch je možné předpokládat, že se ve většině případů jedná o hrnce s uchem. Druhý nejpočetněji zastoupený tvar kuchyňské keramiky představovaly trojnožky. Jedná se o typologicky mladší varianty, kdy výška nožek odpovídá výšce těla nebo ji nepatrně převyšuje. Počet nálezů stolní keramiky oproti kuchyňské byl výrazně nižší. Ze zjištěných tvarů můžeme jmenovat džbány, džbánky, talířovité a hluboké mísy. K malovanému zboží domácí produkce počítáme nálezy keramiky tzv. berounského typu. Kromě jednotlivých střepů se podařilo rekonstruovat část džbánu, džbánku a několik talířovitých mís. Za importy můžeme počítat zlomky kameniny, která pochází ze saského Waldenburgu (*Horschik 1978*) a část majolikové lékárenské nádoby typu albarella, jehož původ je možno hledat v Itálii (*Kube 1976*, tab. 26; *Ronchetti1982*, slide 1/22).

Co do počtu nálezů nejrozsáhlejší soubor představují kachle, z nichž bylo identifikováno celkem 6 604 zlomků. Tvořily časově, stylově a výrobně jednotný soubor, jehož převážná část spadá do druhé poloviny 16. století. Nejpočetněji byly zastoupené čtvercové kachle s miskovitým zahloubení (70 ks, *obr. 20: 1*). Druhý nejpočetněji zastoupeným tvarem jsou obdélné kachle, jejichž reliéfní stěna je zdobena mužskou a ženskou postavou a postavami putti (34 ks, *obr. 19: 1*). Oba tyto typy kachlů jsou v provedení se zelenou glazurou. Stejné technologické provedení má nejméně po sedmi kusech římsových, korunních a patečních kachlů (*obr. 21: 1, 2*). Tyto kachle by mohly pocházet z jedněch kamen, ale bohužel nejsme schopni rozhodnout, zda stála přímo v domě, v jehož sklepích byla nalezena, nebo někde jinde v areálu Pražského hradu.

Zbývajících pět námětů reliéfní stěny kachlů, datovaných do první poloviny 16. století, bylo nalezeno v jediném exempláři. Jedná se o obdélný kachel s motivem ležícího gryfa (*obr. 21: 3*), čtvercový římsový korunní kachel s motivem vyhnání Hagar do pouště (*obr. 19: 3*), který pochází z oblasti středního Německa (*Franz 1969*, 212; *Strauss 1972*, 116: 2), část dvojportrétního kachle s reliéfem ženy v renesančním oděvu (*obr. 21: 4*). Samostatnou složku souboru tvoří nálezy tzv. mozaikových kachlů, jejichž reliéfní plocha je členěna esovitě prohnutými ostrvemi a trojlisty na stonku (*obr. 20: 4*).

Soubor skla obsahoval 610 zlomků skla dutého a 75 kusů skla okenního (*graf 4*). Díky výzdobným charakteristikám a tvarové náplni lze konstatovat, že nálezy odpovídají trendům českého renesančního skla od druhé poloviny 16. do první třetiny 17. století. K nejzajímavějším nálezům patří pohár na nízké patce s polovejčitou kupou, zdobenou rytým šupinovým dekorem, který v dosavadních archeologických souborech z českého prostředí nemá obdoby. Druhý málo častý nález představuje zlomek zřejmě číše, při jejíž výrobě byla užita technika tzv. *millefiori*. Z ostatních nálezů jmenujme části číší a pohárů, dva zlomky víka, části konvice se spirálovitě stáčeným optickým dekorem, zlomek nitkovaného skla, nodus dofouknutý do formy s motivem rostlinných úponků a konečně i část kupy poháru s rytým motivem (*obr. 22*).

V souboru byl proveden osteologický rozbor kostí, který zjistil vysoké zastoupení skotu, ovcí a koz na úkor zvěřiny a ryb. Současně byl zaznamenán nezvykle vysoký počet kostí ptactva. Za nález mimořádného významu pak můžeme považovat identifikované pozůstatky krocana, které představují jeden z nejstarších nálezů v českém prostředí.

Ze sledované části výzkumu bylo získáno 11 mincí, dva početní peníze a několik drobných zlomků neurčitelných mincí. Časový záběr zahrnuje mince kutnohorské ražby od vlády Vladislava II. Jagellonského (1471-1516) až po vládu Maxmiliána II. (1564-1576). Oba početní peníze pocházejí z přelomu 16. a 17. století z Norimberku. Nejpočetnější zahraniční složku tvoří ražby saské. Chronologické rozložení nálezů nekoresponduje s jejich stratigrafickou polohou.

Přehled drobných nálezů není ani příliš rozsáhlý, ani různorodý. Lze je rozdělit na čtyři základní skupiny. Nejpočetnější tvoří výrobky z bronzu, následují kostěné předměty, technické doplňky z olova a jeden nález opracovaného parohu (*obr. 23*). Obecně lze shrnout, že se jedná o předměty, které nenesou žádné jasnější chronologické znaky a jejich výskyt je průběžný.

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Jesuit college in Kutná Hora: courtyards and their facilities in the 17th-19th century. Archaeological excavations in 1998-2005

Jezuitská kolej v Kutné Hoře: nádvoří a jejich vybavení v 17.-19. století. Archeologický výzkum v letech 1998-2005

Das Jesuitenkolleg in Kutná Hora: Der Hof und die Ausstattung im 17.-19. Jahrhundert. Die Grabungen in den Jahren 1998-2005

Jan Frolík

Bei der Grabung im Areal des Jesuitenkollegs in Kutná Hora wurden die Überreste einer älteren Vorstadt aus dem 14.-16. Jahrhundert entdeckt, an dessen Stelle das Kolleg nach 1667 errichtet wurde. Es ist gelungen, den Grundriss und die Grundausstattung der Gärten zu rekonstruieren, die sich im 17.-18. Jahrhundert auf dem unteren Hof des Kollegs befanden, gleichzeitig wurden auch die Veränderungen bei der Umgestaltung des Kollegs zu einer Kaserne nach 1773 dokumentiert.

The Jesuit college in Kutná Hora (Barborská Street nos. 51-53) is a significant element in the town's skyline. The building, which was used by the army for over two centuries, was recently obtained by the Czech Museum of Creative Arts (formerly the Central Bohemian Gallery). The building is undergoing significant modernisation work during which it will be transformed into an international exhibition and congress centre. The college's wide-ranging premises comprise several units. The dominant building is the college itself, which is in the shape of an inverted F. The short wing is defined by two courtyards – the larger southern (upper) and the smaller northern (lower). The level of both courtyards is lowered compared to the wide-ranging rear (the "upper plateau"), on which the building of the former temporary college stands. Archaeological rescue excavation was done on all these basic parts.

Fig. 1. Kutná Hora, Jesuit College. Overall view from the south (from the Cathedral of Saint Barbara).
Photos 1, 2, 6-13 J. Frolík.
Obr. 1. Kutná Hora, Jezuitská kolej. Celkový pohled od jihu (z chrámu sv. Barbory).
Foto 1, 2, 6-13 J. Frolík.

Archaeologists entered the college building in 1998, when, due to the preparations for the modernisation project, structural probes were inserted in the college's interior and later documented for archaeology. The archaeological excavation continued in 1999 using investigatory probing on the upper plateau. Several probes were inserted along the route of a lane that had vanished, to check its course and determine a guide for the planned (but unrealised) division of the site. Archaeological rescue excavation was performed in 2002-2003 on both courtyards behind the college. Wide-ranging technical equipment and facilities were to be placed under the surface of both courtyards. The aim of the excavation was to first check whether terrain older than the Jesuit college had survived here.[1)] Eight probes were inserted in the upper courtyard in 2002 to check for the existence of older terrain and the situation under the backfills and levels

Note 1:
The general assumption that the site of the Jesuit college only contained backfills from the time the college was built and ossibly younger strata meant that the investor and most monument protection bodies originally did not expect archaeological excavation, and this request was pushed through later.

Fig. 2. Kutná Hora, Jesuit College. Temporary college building on the "upper plateau". Condition in 2005. View from the east.
Obr. 2. Kutná Hora, Jezuitská kolej. Budova provizorní koleje na tzv. horním platu. Stav v roce 2005. Pohled od východu.

from the time the college was built. A probe allocated to the lower courtyard near a cellar older than the Jesuit college was to check the degree of preservation of terrains contemporary with the cellar. The find of a limekiln on the upper courtyard and the find of late medieval terrains on the lower courtyard led to the continuation of the excavation the next year. The excavation was suspended in 2004, as the investor apparently reduced the scope of the basements to be built and therefore the work to be done on the terrain.

The changed situation and the digging of a new basement on the lower courtyard meant wide-ranging rescue excavation was necessary in 2005. First a common trench for utilities was dug in an archaeological manner across the upper plateau to the college building. There followed surface uncovering of the lower courtyard. Less wide-ranging excavation was also performed in the college's interior, which was affected by surface excavation a utilities collector. The aforementioned work enabled the collection of the basic information about developments in the settlement of the area of the Jesuit college before it was built, during its construction, and after it was closed.

Based on previous archaeological excavation, it is possible to partially reconstruct the original form of the terrain. It was a sloping area, slanting from west to east, as well as to the southeast, i. e. towards the valley of Vrchlice Stream. Under the original soil level there was a loess layer, sitting at a depth of several metres on a rock base. It is probable that there was a natural gully or depression in the place of the lower courtyard that cut into the slope above the Vrchlice. Part of it was later used as the town moat. To prove this hypothesis, however, it would be necessary to perform archaeological excavation to a much greater depth on a larger area.

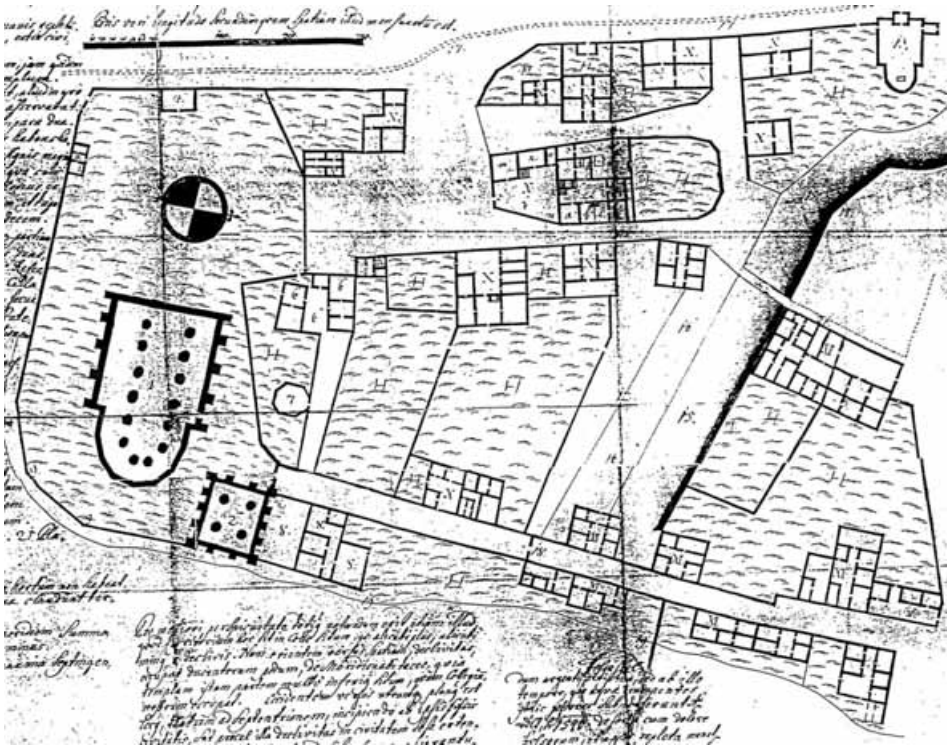

Fig. 3. Kutná Hora, Jesuit College. Plan from 1732 showing the situation before the building of the college. The plan shows the original street going through the later site of the college and the route of today's Barborská street to the Cathedral of Saint Barbara. The building marked X on the east side was partially found by archaeological excavation. The plan was probably partially schematised and it is not yet possible to determine to what extent it is precise.
Obr. 3. Kutná Hora, Jezuitská kolej. Plán z roku 1732, znázorňující situaci před postavením koleje.
Plán zachycuje původní uličku, procházející pozdějším areálem koleje, i trasu dnešní Barborské ulice k chrámu sv. Barbory. Objekt označený X na její východní straně byl zčásti zjištěn archeologickým výzkumem. Plán je pravděpodobně zčásti schematizován a nelze prozatím určit, do jaké míry je přesný.

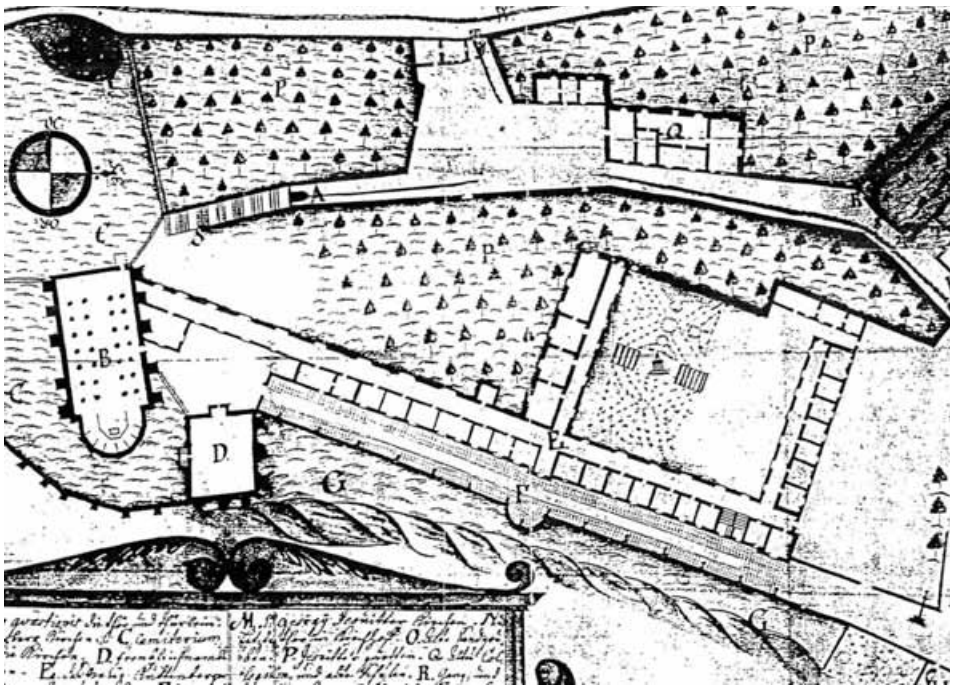

Fig. 4. Kutná Hora, Jesuit College. Plan dating from 1732. The plan shows the college to the same structural extent as survives today (with the exception of the passage linking it to the Cathedral of Saint Barbara). On the west side of the lower courtyard stands building B and a park is also shown. The upper plateau is crossed by an older lane, by which a temporary college building stands (Q). The plan generally corresponds to facts ascertained, but has been slightly schematised.
Obr. 4. Kutná Hora, Jezuitská kolej. Plán z roku 1732. Plán zachycuje kolej ve stejném stavebním rozsahu, v jakém se dochovala do současnosti (s výjimkou spojovací chodby do chrámu sv. Barbory). Na západní straně dolního nádvoří stojí tzv. budova B a zachycena je i parková úprava. Tzv. horním platem prochází starší ulička, u níž stojí budova provizorní koleje (Q). Rámcově plán odpovídá zjištěným skutečnostem, je však mírně schematizován.

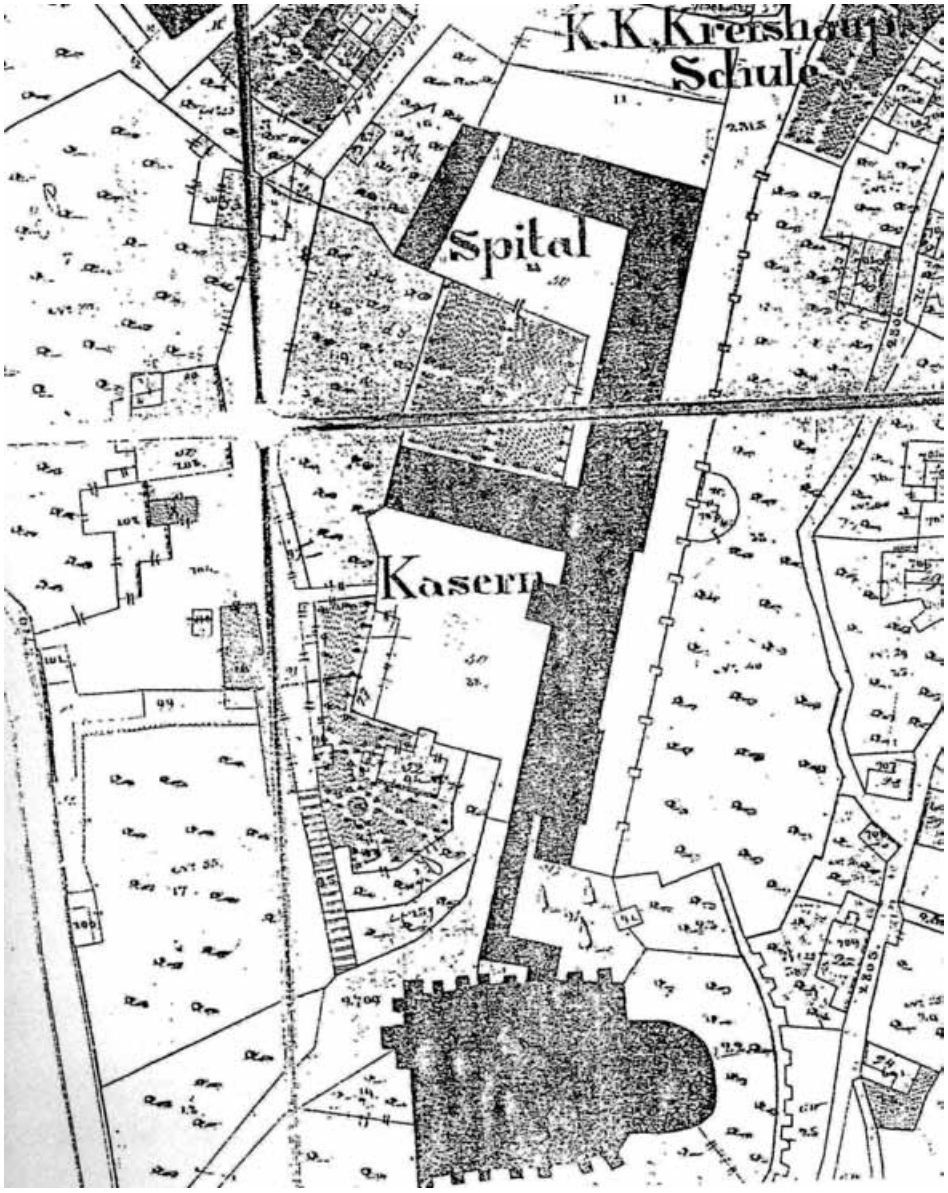

Fig. 5. Kutná Hora, Jesuit College. The college after transformation into a barracks and military hospital in sketches dating from 1840. A simple park/garden is shown in the lower courtyard. Older Jesuit elements have already been removed. The college is shown before the building of the toilet towers in 1856-8.
Obr. 5. Kutná Hora, Jezuitská kolej. Kolej po přeměně na kasárna a vojenský špitál na indikační skice z roku 1840. Na dolním nádvoří je zachycena jednoduchá parková/zahradní úprava. Starší jezuitské prvky jsou již odstraněny. Kolej je zachycena ještě před přistavěním záchodových věží v letech 1856-8.

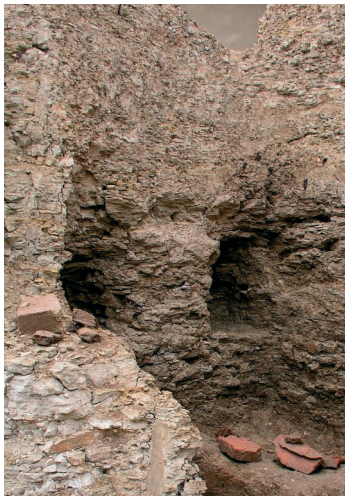

Fig. 6. Kutná Hora, Jesuit College. Lower courtyard. Upper part of mine shaft from the 14th century. View from the east.
Obr. 6. Kutná Hora, Jezuitská kolej. Dolní nádvoří. Horní část důlní šachty ze 14. století. Pohled od východu.

Fig. 7. Kutná Hora, Jesuit College. Lower courtyard. Defile path leading to a house standing on the college's location, 14th-16th century. View from the northwest.
Obr. 7. Kutná Hora, Jezuitská kolej. Dolní nádvoří. Úvozová cesta směřující k domu, stojícímu na místě koleje, 14.-16. století. Pohled od severozápadu.

Based on traces of settlements older than the college, it was possible to deduce that there were two houses here that had to make way for the construction of the college (*Vlček – Sommer – Foltýn 1997*, 324-327). A Gothic cellar survived from one of them and had a layout in the shape of a three-leafed plant in the southeast corner of the lower courtyard. Archaeological evidence of activities older than the college was registered in three separate sites.

We can date the oldest medieval terrains and situations to the end of the 13th century and link them to mining activities. In addition to the known mouth of a mine shaft, evidence of three other shafts was found on the area of the lower courtyard. In two cases there were circular shafts with traces of timbering, which, however, was not preserved. The depth of both shafts is unknown, but both continued under the bottom of the construction pit (i. e. they were more than 6m deep). Judging by ceramics from the backfills, comprising mostly waste, we can date these shafts to the end of the 13th or beginning of the 14th century. A third object was evidently dug as a circular shaft. Part of it was massive, a staircase carved into the rock that reached the bottom. It seems that it was to be a work with thorough foundations that was, however, abandoned after the staircase was dug and then filled with waste and debris. A preliminary dating for the object's demise would be around the 15th century.

Other documents of mining activity were examined on the slope separating the lower courtyard and the upper plateau. A cross-section of the terrain here shows piles of waste covering the original soil layer; nearby is a square-shaped object with intensive signs of pyrotechnical activities. The interpretation, however, remains unclear. According to occasional finds of ceramics, the piles were completed around the 14Fcentury. There were more piles in the northeast corner of the lower courtyard.

The digging of a town moat, which went across the lower courtyard, entailed a significant alteration to the terrain. Only based on wider circumstances could we date it to the 14th century, as the excavation itself did not provide clear evidence. A suburb gradually arose on the area outside the moat and several buildings are known to have stood there. One of them was on the upper plateau by the aforementioned street. What is known of it is part of the basement (cellar), which was made of masonry and mortar in the 15th century. Another building of the same age stood nearby (*Frolík 2000*). The most information was obtained about a house whose cellar survived in the southeast corner of the lower courtyard. The house stood on a lot that was settled in the 14th century. The stone architecture, documented by the surviving cellar and part of another room east of the cellar, was built in the 15th century (according to ceramics from the vault infilling – *Blažková-Dubská – Frolík 2005*) and probably underwent alterations in the next century. West and north of the building was an area with lighter wooden buildings on several levels. This area also contained a waste pit from the end of the 14th and first half of the 15th century. There was a path to this house and it survives in the form of a marked ditch-like shape (defile) from southeast to northwest. Situations older than the college also include a paved area, documented by the eastern wall of the southern part of the east wing (probe A 10; *Frolík 1999*). The dating is based on stratigraphic observations; the archaeological situation did not provide dating material.

We can compare the situation found with the surviving plan, which should show the situation before the college was built. It was, however, made in 1732, i. e. approximately 70 years after construction work started. If we compare the situation recorded by the plan with archaeological findings, we find

agreement in particular for large, stand-out structures, such as the course of the town moat. Another element is the street that went down the centre of the site and was preserved after the construction of the college. There should have been houses on both sides of the street and their existence was documented by the excavation, but not enough knowledge has yet been accumulated for a more detailed comparison. The plan shows two structures in the building's area, one of which is marked with an X and must be the same as the building of which there remains a Gothic cellar under the college, of which excavation found masonry and also some facilities behind the house. The layout recorded on the plan, however, cannot be linked to the archaeological findings. Another house (XI) is recorded on the path of the moat and it is possible that it is related to the paved area documented in this location by a probe.

The building work itself was preceded by thorough preparation of the building site. The originally sloping terrain was altered, probably in accordance with an existing project. A basic requirement for construction was to obtain a level surface. This meant significantly lowering the level of the terrain on the southern side, because it is near the Cathedral of Saint Barbara that the level of the terrain was the highest. In these places the level of the terrain was lowered so much that not only any later deposits arising from human activity, but also the loess covering and the upper part of the rock base (up to 0.7 m under the surface of the current floor) was removed. On the northern side (i. e. under the future northern wing and the northern part of the southern wing) the terrain was raised by backfills, so in some places the loess was retained in the original thickness, as was the original soil level. The backfills comprise layers of moved loess, the original soil type and also debris. Such alterations meant that the interior of the future college reached the building level (between 0.7-0.25 m under the current floors on the ground floor). The preparation of the building site also naturally saw the demolition of both buildings standing there (one of their cellars remained, probably because it did not affect the future college's layout). The future southern (upper) courtyard was lowered to the same level, i. e. up to 5 metres below the contemporary surface. This meant the whole area of the courtyard was lowered under the level of the surface of the rock base. The gravel-sand Pleistocene terrace of the Vrchlice was even recorded in the west, where the terrain originally rose.

Work on the northern (lower) courtyard proceeded differently. The architectural plan here assumed the partial preservation of the original lie of the land. The depression of the town moat was dealt with. The infilling here also comprised debris and older settlement layers. The clayey bedrock was cut so that it gradually sloped to the south, from the level of the northern wing with the refectory to the middle wing with the summer refectory. The difference between the two levels was one floor.[2)] A path (found in the form of a defile) also ceased to exist due to the work and had previously led from the town (street – lot number 302) to a house with a Gothic cellar that was demolished. It can be assumed that the path continued to the Cathedral of Saint Barbara. Overall, we can summarise the work by saying that a large cut was made in the slope above the Vrchlice for a significantly lowered level on the upper courtyard and sloping terrain on the lower courtyard.

The alteration to the original level of the terrain also led to a change to the hydrological regime, which had to be dealt with. A shaft was made in the backfill in the town moat and walled with quarried stone mixed with bricks. The shaft dewatered the future northern wing and the building

Fig. 8. Kutná Hora, Jesuit College. East wing interior. Stone dewatering shaft. Surface part with numerous younger events visible. Shortly after 1667. View from the north.
Obr. 8. Kutná Hora, Jezuitská kolej. Interiér východního křídla. Kamenná odvodňovací štola. Povrchová část s četnými mladšími zásahy. Krátce po roce 1667. Pohled od severu.

Note 2:
However, neither of these buildings, the north and middle wings, had been built by this time.

Fig. 9. Kutná Hora, Jesuit College. Lower courtyard. Ditch for water mains leading to the foundations for the fountain. Iron connectors for wooden piping survived in the ditch. View from the west.
Obr. 9. Kutná Hora, Jezuitská kolej. Dolní nádvoří. Výkop pro vodovodní řad, směřující k základu pro kašnu. Ve výkopu dochovány železné spojky dřevěného potrubí. Pohled od západu.

on the western side of the lower courtyard (i. e. building B). Another branch of the shafts dewatered the surface and underground water from the future eastern and central wing. A gutter was dug to collect water along the (future) western facades of the southern part of the east wing. The trough led into a shaft built in a corridor in the interior of the college along its western wall. A smaller branch of the shaft also took away water that gathered in the basement of the middle wing and, through yet another branch, water from the deep (English) court where the middle wing and the northern part of the east wing met. This system of shafts led into a main shaft in the original moat that ran along the east wing of the college and surfaced on the slope above the Vrchlice. Smaller (independent?) drains dewatered the interior of the southern part of the east wing and also the filled-in defile to the building on the site before the college.

After resolving the problem of surplus water, attention was paid to bringing in drinking water. This was achieved by laying several branches of wooden horizontal piping linked with iron sleeves. The water piping led to a site at the place of the current entrance from Kremnická street. Water had to be brought from an unknown place west of the college. The way in which the water mains got over the depression (defile?) where Kremnická street is today is unknown. The water mains, located at a depth of around 1 m, divided into at least 2 branches. One led to the building of the temporary college, the other to the main building. The ground level was overcome using a deep, walled shaft. After going through a supporting wall, the water mains continued along an ordinary ditch filled in with earth. On the slanting area of the lower courtyard, two branches separated from the chief mains and led northeast. Both the two branches came out in the Jesuit college building, but the exact location is not entirely clear.[3)] The main water mains branch led to the base of the fountain that was to be in the southern part of the lower courtyard. The last part of the water mains again led through a walled shaft (this time brick). This was at places where it crossed the main road.

The construction of the drainage and water mains system ended the preparatory works and the actual construction of the college itself followed. The foundation stone was laid in 1667. The north wing (with the refectory) was built first, and was followed by the construction of the east wing, gradually along the whole length. The last part was the construction of the middle wing. According to historical building research, as well as an art-historical analysis of the decoration, the building of the north wing ended in 1678 (the artistic decoration was completed in 1689), the middle wing was to be completed in 1750.[4)] The planned south wing was never built, although, judging by the vault runs on the southern end of the west wing, its construction was planned and the foundation stone was laid in 1721 (*Dudák 2004*, 159-160).

The lower courtyard was transformed into a garden at the same time. The sloping terrain was divided into four height levels by the construction of three terrace walls. Only the stone foundation parts of the lower two have survived. Only the highest terrace wall was made of brick and, on the outer side, broken by decorative semi-pillars. In their surviving form they were all quadratic.

Note 3:
Their entire course was not investigated and the situation around the college's front on the courtyard side has been destroyed by unannounced excavation work. Probes in the interior did not find traces of water mains. We can, however, assume that one of the branches came out in the north wing with the refectory. A bricked up pool of unclear purpose was discovered in a room on the western part of this wing.

Note 4:
This late date, appearing in all literature and based on an art-historical analysis of the decoration of the summer refectory, can be questioned based on a veduta of Jiří Čáslavský dating from 1674 (*Dudák 2004*, 150), which undoubtedly shows the roof of the middle wing, which has already been built, as well as the whole east wing with all its towers. The discrepancy could be explained by the construction of the building in rough form and the completion of artistic decoration after a marked interval.

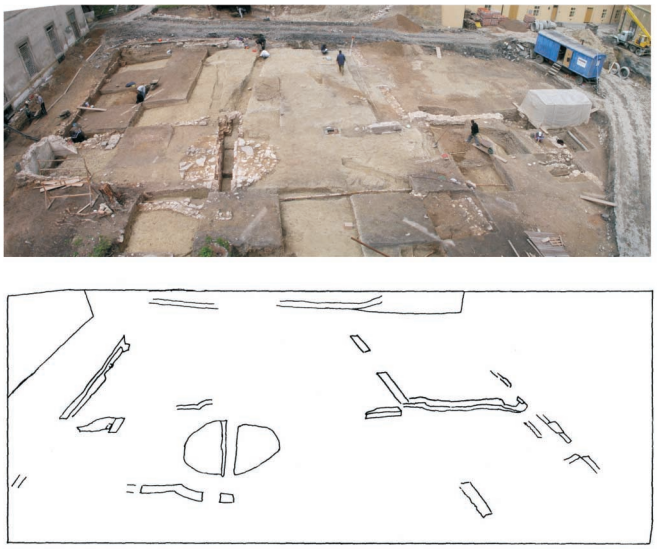

Fig. 10. Kutná Hora, Jesuit College. Lower courtyard. Surviving traces of the park. On the right a terrace wall with a sill, traces of another terrace wall to its left. On the left the fountain foundations with a ditch for water mains. The foundations are lined by two arching walls. At the left edge is the highest terrace wall, made from bricks, and the remnants of the staircase. View from the east.
Obr. 10. Kutná Hora, Jezuitská kolej. Dolní nádvoří. Dochované stopy parkové úpravy. Vpravo tarasní zídka s prahem, vlevo od ní stopy další tarasní zídky. V levé části základ kašny s výkopem pro vodovodní potrubí. Základ je lemován dvěma obloukovitými zídkami. Zcela vlevo nejvyšší tarasní zídka z cihel se zbytkem schodiště. Pohled od východu.

Fig. 11. Kutná Hora, Jesuit College. Lower courtyard. Surviving traces of the park. At the bottom is part of the lowest terrace wall with two older entrances with stone sills on the sides and a more recent entry with a sill in the middle. Post pits are visible on the sides of the sill. In the middle are circular foundations for a fountain; behind it is the surviving part of the upper staircase. On the right at the back the highest brick terrace wall with semi-pillars. The picture shows that the main axis of the park was composed around the entrance to the middle wing. View from the north.
Obr. 11. Kutná Hora, Jezuitská kolej. Dolní nádvoří. Dochované stopy parkové úpravy. Dole část nejnižší tarasní zídky se dvěma staršími vstupy s kamennými prahy po stranách a s mladším vstupem s prahem uprostřed. Po stranách prahu patrny kůlové jámy. Uprostřed kruhový základ kašny, za ním dochovaná partie horního schodiště. Vpravo vzadu nejvyšší cihlová tarasní zídka s polopilíři. Snímek dokládá, že hlavní osa parkové úpravy byla komponována na vstup do středního křídla. Pohled od severu.

Originally it was thought that quadratic and round pillars would alternate, as is shown by the round foundation of one of them. However, they were transformed into quadratic shapes during construction.

The basic axis of the landscaping was between the entrance to the north wing and the entrance to the middle wing (i. e. a communication between the two refectories). It was formed by a path crossing the lowest terrace wall. There were two passages with stone sills. It reached the level formed by the second terrace wall in an unknown manner. It continued to go round the fountain that is documented by the round stone base. It crossed the third (brick) terrace wall by means of a staircase, of which only a fragment of two steps has survived. In the next stage passage through the lowest terrace wall was limited to a sole entrance, directly on the axis of the entrance to the central wing. There was a stone sill here as well. A wooden gate was part of the entrance (?), as is shown by two deep post pits on the sides of the sill. The original entrances were bricked up and made part of the terrace wall. A staircase connected to this new entrance, although the only evidence on the ground is in the form of a stone base for three steps. The staircase and path were lined by a wall. The sides of the fountain's foundations are documented on the west side between the lower and middle terrace wall, in the form of two sections of foundation masonry. Walls here were partially rounded in shape, to retain the planned width of the path around the fountain. On the west side the park was lined with a high terrace wall from stones on mortar, which equalised the height difference between the park and the level of the upper plateau. In the original form the wall led to the northwest corner of the middle wing.[5)] We can compare this landscaping with the preserved plan of the college made in 1732. On the plan the college is shown to the extent in which it survives today, i. e. with the middle wing.[6)] The park is recorded

Fig. 12. Kutná Hora, Jesuit College. Lower courtyard. The highest terrace wall for the park, made out of bricks. Three brick semi-pillars are visible. View from the northwest.
Obr. 12. Kutná Hora, Jezuitská kolej. Dolní nádvoří. Nejvyšší tarasní zeď parkové úpravy z cihel. Patrny tři cihlové polopilíře. Pohled od severozápadu.

Fig. 13. Kutná Hora, Jesuit College. Lower courtyard. Part of the upper staircase with two steps surviving. View from the north.
Obr. 13. Kutná Hora, Jezuitská kolej. Dolní nádvoří. Dochovaná část horního schodiště se dvěma stupni. Pohled od severu.

Note 5:
It survived almost intact until the current modernisation work, when it was dug up completely, to obtain sufficiently wide access for lorries to the construction pit for the new basement. The wall was regarded as a modern alteration from the 20th century.

Note 6:
Which strengthens the case for completion earlier than in 1732.

Note 7:
The land between the foundations for the fountain and the second terrace wall was lowered to such an extent that no observation of this is possible.

in the form after the construction of the single central staircase. The plan resolves the problem of whether the staircase was continuous or made up of several separate sections.[7)] The lower section evidently filled in a section between the lower two terrace walls, the upper started where the surviving lower step is above the foundation and ended by the upper edge of the brick terrace wall. The plan also shows the fountain (from the side), although its layout on the ground cannot be deduced. The space on the sides of the staircase is broken by a system of footpaths (?) and possibly circular flower beds. On the contrary, the plan does not show the terrace walls or the walls that were broken by the staircase from the side. We can characterise it as being schematic and showing the most important objects (staircases and fountain).

The archaeological excavation also dealt with the loss of the park, undoubtedly related to the closure of the college in 1773. The college was obtained by the army and construction alterations were performed in 1776-7. The northern part of the college was transformed into a military hospital and the southern part into a barracks. The alterations are not archaeologically apparent in the college's interior. They undoubtedly led to several pits with a quantity of fragments of stove tiles in both courtyards, as well as a mix of such artefacts in the vault (or rather under-floor backfills on the first floor). It is, however, not possible to decide whether the stone is linked to the alterations in 1776-7, or later adaptations in 1843-4.

During these alterations the park divided by the terrace walls was removed. The whole area was levelled without traces of an architectural solution. A large mixture of older material was used in the uniform levelling. These alterations particularly affected the middle part of the garden, which was raised. The levelling layer rested on the bedrock in places. The form of the lower courtyard was approximated by sketches from 1840, which show, instead of the original park, a roughly square area, divided by paths into quarters. Not even here can archaeological material determine whether this happened in 1776-7 or 1843-4. Further alterations during the second half of the 19th century and the 20th century removed this utilitarian arrangement. The final result

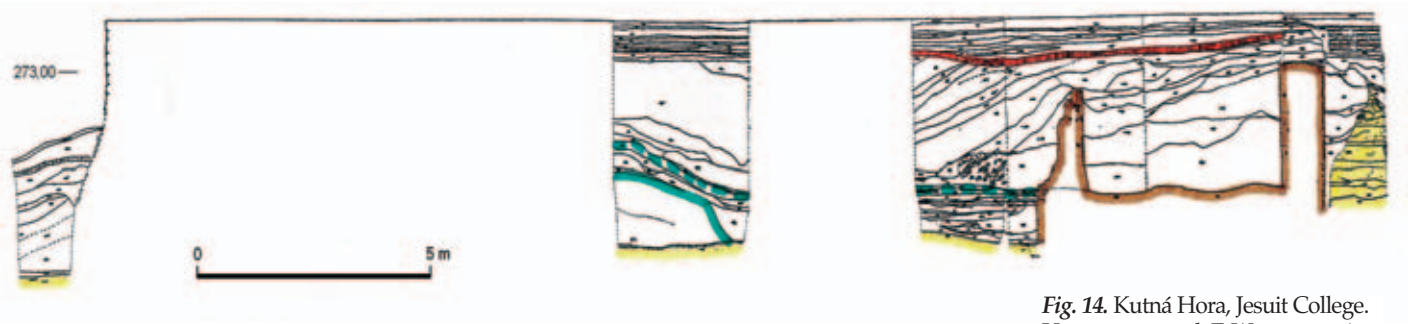

Fig. 14. Kutná Hora, Jesuit College. Upper courtyard. E-W cross-section in the place of the limekiln (after 1667 – before 1732). The level of the lowered bedrock is in yellow, on the right is the Pleistocene sand terrace of the Vrchlice. Limekiln masonry (marked in brown) is in the right-hand part. The kiln is covered by paving (marked in red) from the period after adaptation into a barracks (after 1776). The green marks the level of the terrain at the time the kiln came into and went out of service. On the left the upper terrace wall behind the college's east wing. Drafted by J. Frolík based on terrain documentation.
Obr. 14. Kutná Hora, Jezuitská kolej. Horní nádvoří. Řez ve směru V-Z v místě pece na pálení vápna (po 1667 – před 1732). Žlutě úroveň sníženého skalního podloží, vpravo písky pleistocénní terasy Vrchlice. V pravé části zdiva pece na pálení vápna (vyznačena hnědě). Pec překrývá dlažba (vyznačena červeně) z doby po adaptaci na kasárna (po 1776). Zeleně vyznačena úroveň terénu na počátku fungování pece a na konci její funkce. Vlevo horní tarasní zeď za východním křídlem koleje. Z terénní dokumentace sestavil J. Frolík.

was a mostly asphalted area, in places lowered to the level of the alterations at the end of the 18th century and the beginning of the 19th century. Along the middle wing there was a terrace whose size (probably quite unintended) was the same as the original highest part of the Jesuit garden. The grassy part with trees in the southeast corner of the courtyard remained from the alterations before 1843-4. All traces of older conditions were removed by insensitive deepening of the basement for technical facilities in the spring of 2005, which was the cause of the archaeological rescue excavation.

Different developments were found on the large (upper) courtyard. The marked lowering of the original level of the terrain by up to 5 m has already been mentioned. A construction pit was prepared, evidently for the construction of the southern wing and probably for the planned alterations to the courtyard. However, none of these activities were performed. The construction pit was used for dumping building waste. This situation was ascertained by all the probes but one.

Probe IV showed a different situation, where the remains of a technical facility – a limekiln – were found. By gradually expanding the space being investigated in the summer of 2002 and spring of 2003, the team succeeded in uncovering the whole inner space of the aforementioned facility. The kiln was situated on the edge of the sandy Pleistocene terrace of the Vrchlice. The kiln's layout is in the shape of a horseshoe approximately 6 m wide and 7 m long. The horseshoe jacket on the kiln was made from stone and mortar, the inner side from bricks. The kiln was operated using two approximately 150 cm high and 90 cm wide vaulted openings, one of which, on the input side, lacked stone facing. The clay floor in the inner kiln space, which was partially covered by a limy crust, contained two parallel heating channels, which connected at the front to two filling openings and were evidently for inputting air into the kiln originally. These channels went to approximately three quarters of the depth of the inner space of the kiln. Both were completely filled with a mixture of burned lime and earth. Intensive use was made of the kiln, as is shown by the brick piecing on most of the lower part of the inner jacket. In the upper section, the surface of older bricks was often sintered to the point of non-recognition. The inner side of the kiln's front wall was also sintered and cracked. The intensive operation of the kiln also accounts for the situation in the pre-firing area, where there is a marked number of regularly alternating limy and burned layers. The situation investigated shows a one-chamber kiln with direct heating and a flue gas installation in the upper part, which no longer exists. It is a type of limekiln in which pieces of limestone were mixed with fuel or were placed in layers, alternating with layers of fuel. Based on the material obtained, it is impossible to rule out the possibility that the kiln was used for making bricks, as well as for lime.

The operation of the kiln was undoubtedly related to the building of the Jesuit college. The kiln could have been built immediately after the start of building

Fig. 15. Kutná Hora, Jesuit College. Upper courtyard. View into the interior of a limekiln. Front wall at the back with two entrances. View from the west.
Obr. 15. Kutná Hora, Jezuitská kolej. Horní nádvoří. Pohled do interiéru pece na pálení vápna. Vzadu přední stěna se dvěma vstupními otvory. Pohled od západu.

Fig. 16. Kutná Hora, Jesuit College. Upper courtyard. View into the interior of the kiln. Wide-ranging brick repairs are visible in the lower part of the inner jacket. The upper part of the brick masonry is overburned to sintered. View from the east.
Obr. 16. Kutná Hora, Jezuitská kolej. Horní nádvoří. Pohled do interiéru pece. Ve spodní části vnitřního pláště viditelné rozsáhlé opravy z cihel. Horní část cihlového zdiva přepálená až slinutá. Pohled od východu.

Fig. 17. Kutná Hora, Jesuit College. Upper courtyard. Part of the stone facing damaged by the building's transformation into a barracks (after 1776). View from the south.
Obr. 17. Kutná Hora, Jezuitská kolej. Horní nádvoří. Část kamenné dlažby položená po adaptaci objektu na kasárna (po 1776). Pohled od jihu.

work on the college (after 1666). It was kept in operation for a long time, which is shown by the stratigraphic situation, amongst other things. Layers of construction debris built up around the kiln, but the surrounding area was kept at its original level, so at the end the kiln was in a sort of depression. In addition to building waste, kitchen waste from the college (which is further evidence of the kiln's long use) was found in the same area. After the kiln was taken out of service, it was covered up and the terrain above it was brought up to the level of the courtyard. The archaeological material is not sufficient to determine the date on which it was taken out of service, but a 1732 plan shows the upper courtyard with a garden (otherwise undivided) with trees. The kiln was not in operation then.

The original design, which anticipated a deep courtyard, was not implemented on the large courtyard. The only deep part was the strip of ground immediately behind the college's east wing, at the bottom of which was a gutter that collected surface and underground water from the area behind the college. This deep strip of ground was defined by two steps of terrace walls, which the plan does not show, although they survived until the current modernisation. This detail of the plan is therefore schematised. After the transformation into a barracks, the garden was replaced by a courtyard that was partially paved (where the paths were). The rest of the space was gravelled and very flat. The military stage was accompanied by negligent care for the dewatering gutter, which was later covered up and replaced in the 20th century by concrete guttering sloping to the other side.[8)] A garden is shown in a 1732 plan on the upper plateau. Here, archaeology only shows a wide-ranging alteration to the terrain. The original terrain, which was evidently a regular slope towards the Vrchlice, was flattened by the ground on the western part of the originally built-up area being relocated to the eastern part. This established a marked step in the terrain

Note 8:
The ground water collecting on the surface of the bedrock could not be taken away by the new gutter on the raised level and got into the college's interior, where it became a cause of constant dampness.

between the upper plateau and the two courtyards behind the college, which were lower. The northern part of the step was strengthened with a supporting wall, which lined the park in the lower (northern) courtyard on the west side. The edge between the plateau and the large (southern) courtyard was evidently not landscaped in any way. The plan does not show any landscaping and archaeological excavation is negative. The overall division of the space and the landscaping around the former temporary residence is also not sufficiently documented. The line ditch for utilities showed the breakdown through paths and also flower-bed edges (?). The landscaping was later replaced (in the 19th century) by a barracks form with flattened ballasted areas.

From the archaeological viewpoint, the Jesuit college in Kutná Hora is a relatively young building. However, the archaeological rescue excavation brought a number of new and detailed insights about its construction and further development in the 18th to 20th centuries, which go beyond the evidence contained in written and iconographic sources. It showed that from the beginning the college's construction followed a single project, which was implemented and observed throughout the construction period, which lasted for several years. The park in the lower courtyard was probably established before the summer refectory in the middle wing could have been used, even though the park was subordinated to the refectory. The situation in the upper courtyard is different, as the original (not known in detail) plan was abandoned and the simplest design was implemented. This may be linked to the incomplete building plan – the college's southern wing was not built.

It seems banal to say that the rescue excavation provided a huge amount of new knowledge, as well as tangible items, which, after processing, will certainly illuminate life in the Jesuit college and younger barracks, as well as the military hospital. Given the current modernisation for exhibition purposes, the original garden could have been restored, at least in part. However, its form would have to have been known during the preparation of the project, when archaeological excavation should also have been done – as it was, there was no choice but to give up this option.

Resumé:

Objekt Jezuitské koleje v Kutné Hoře (Barborská ulice č. p. 51-53) prochází rozsáhlou rekonstrukcí, při které se má proměnit na mezinárodní výstavní a kongresové centrum. Rozsáhlý areál koleje se skládá z několika celků. Stavební dominantou je samotná kolej na půdorysu obráceného písmene F. Krátká křídla vymezují dvě nádvoří – větší jižní (horní) a menší severní (dolní). Úroveň obou nádvoří je snížena oproti rozsáhlému zázemí (tzv. horní plato), na němž stojí budova bývalé provizorní koleje. Záchranný archeologický výzkum probíhal v letech 1998 (interiér koleje), 1999 (tzv. horní plato), 2002-2003, 2005 (obě nádvoří koleje, tzv. horní plato, interiér).

Na základě dosavadních archeologických prací je možno zčásti rekonstruovat původní podobu terénu. Jednalo se o svažitou plochu, skloněnou od západu k východu a také k jihovýchodu, tj. směrem do údolí potoka Vrchlice. Pod původním půdním horizontem se nacházelo sprašové podloží, nasedající v hloubce několika metrů na skalní podloží. Je pravděpodobné, že se v místě dolního nádvoří nacházela přirozená rokle či deprese.

Nejstarší středověké terény a situace můžeme datovat do závěru 13. století a spojit je s hornickou činností. Na ploše dolního nádvoří byly kromě známého ústí důlní šachty registrovány doklady dalších tří šachet. Podle keramiky ze zavážky, tvořené převážně hlušinou, datujeme tyto šachty do období od konce 13. až do 15. století. Na tzv. horním platu byly zjištěny haldy hlušiny, podle ojedinělých nálezů navršené ve 14. století.

Výrazný zásah do terénní konfigurace znamenalo vyhloubení městského příkopu, procházejícího dolním nádvořím. Jen podle širších okolností ho datujeme do 14. století, výzkum samotný jednoznačné doklady nepřinesl. Na ploše vně příkopu postupně vzniklo předměstí, z něhož bylo zachyceno několik staveb. Nejvíce informací bylo získáno o domě, z něhož se dochoval sklep v jihovýchodním rohu dolního nároží koleje. Dům stál na parcele s počátkem osídlení ve 14. století. Kamenná architektura, doložená dochovaným sklepem a částí další místnosti východně od sklepa, byla postavena v 15. století (podle keramiky z klenebních zásypů – Blažková-Dubská – Frolík 2005) a pravděpodobně byla upravována ve století následujícím. Západně a severně od domu se rozkládala plocha s lehčími dřevěnými stavbami v několika horizontech. Součástí této plochy byla také odpadní jímka z konce 14. a první poloviny 15. století. K tomuto domu směřovala cesta, dochovaná v podobě výrazného příkopovitého útvaru (úvozu), a to ve směru jihovýchod-severozápad.

Zjištěnou situaci můžeme konfrontovat s dochovaným plánem, který má zachycovat situaci před postavením koleje. Pořízen byl však až v roce 1732, tj. přibližně 70 let od zahájení stavby. Srovnáme-li plánem zaznamenanou situaci s archeologickými zjištěními, nacházíme shodu zejména u rozsáhlých a výrazných objektů, jako je průběh městského příkopu. Dalším prvkem je ulička, která procházela středem areálu a byla zachována i po výstavbě koleje. Po obou stranách uličky měly stát domy, jejichž existenci výzkum doložil, ale pro detailnější srovnání je prozatím jen málo poznatků. Na ploše vlastní stavby plán zachycuje dva objekty, z nichž dům označený číslem X musí být totožný s objektem, z něhož existuje gotický sklep pod kolejí a z něhož byla výzkumem objevena další zdiva a také část zázemí za domem. Půdorys zaznamenaný na plánu však nelze propojit s archeologickými poznatky.

Vlastní stavbě koleje předcházela důkladná příprava stavební plochy. Základním požadavkem pro stavbu bylo získání rovné plochy. Znamenalo to na jižní straně podstatně snížit úroveň terénu, protože právě v sousedství chrámu sv. Barbory byla nejvyšší. Úroveň terénu byla v těchto místech snížena natolik že byly odstraněny nejen eventuální starší uloženiny vzniklé činností člověka, ale také sprašový pokryv a povrchová část skalního podloží. Na straně severní (tj. pod budoucím severním a severní částí jižního křídla) byl terén zvýšen navážkami, takže se na některých místech dochovala spraš v původní mocnosti, ale také původní půdní horizont. Touto úpravou bylo v interiéru budoucí koleje dosaženo stavební úrovně (v rozmezí 0,7-0,25 m pod současnými podlahami přízemí). Na přibližně stejnou úroveň bylo sníženo také budoucí jižní (horní) nádvoří, tj. až -5 m od současného povrchu. Po celé ploše nádvoří to znamenalo snížení až pod úroveň povrchu skalního podloží. Směrem západním, kam terén původně stoupal, byla dokonce zachycena štěrkopísková pleistocénní terasa Vrchlice.

Jinak postupovaly práce na severním (dolním) nádvoří. Architektonický záměr zde předpokládal částečné dochování původního průběhu terénu. Zavezen byl městský příkop. Zjílovatělé skalní podloží bylo osekáno tak, že pozvolna stoupalo jižním směrem, a to od úrovně severního křídla s refektářem ke křídlu střednímu s refektářem letním. Rozdíl obou úrovní dosahoval jednoho podlaží.

Zásah do původní úrovně terénu také znamenal změnu hydrologického režimu, s kterou se musel vypořádat. Do zásypu zavezeného městského příkopu byla vložena štola, která odvodňovala budoucí severní křídlo. Jiná větev štol odváděla povrchovou i podzemní vodu z budoucího východního a středního křídla. Podél (budoucí) západní fasády jižní části východního křídla byl vyhlouben žlab, v němž se voda shromažďovala. Žlab ústil do štoly, vybudované v chodbě v interiéru koleje podél její západní stěny. Tento systém štol ústil do hlavní štoly, vložené do původního příkopu, která podcházela východní křídlo koleje a ústila ve svahu na Vrchlicí.

Po vyřešení problému s přebytečnou vodou byla pozornost věnována přivedení pitné vody. Bylo toho dosaženo položením několika větví dřevěného potrubí. Vodovod ústil do areálu v místech dnešního vstupu z Kremnické ulice. Vodovod uložený v hloubce kolem 1 m se dělil nejméně na 2 větve. Jedna směřovala do objektu provizorní koleje, další k hlavní budově. Terénní stupeň byl překonán hlubokou vyzděnou štolou. Po průchodu opěrnou zdí pokračoval vodovod běžným výkopem. V šikmé ploše dolního nádvoří se od hlavního řadu oddělovaly dvě větve. Obě tyto větve ústily v budově jezuitské koleje. Hlavní vodovodní větev ústila v základu kašny, která měla stát v jižní části dolního nádvoří.

Vybudováním kanalizačního a vodovodního systému byly přípravné práce skončeny a byla zahájena stavba vlastní budovy koleje. Základní kámen byl položen v roce 1667. Nejprve bylo postaveno severní křídlo (s refektářem), následovala stavba křídla východního, postupně v celé jeho délce. Poslední realizovanou částí byla výstavba křídla

středního. Podle stavebně historického zhodnocení a uměleckohistorického rozboru výzdoby bylo severní křídlo dokončeno v roce 1678 (umělecká výzdoba byla dokončena až v roce 1689), střední křídlo mělo být dokončeno v roce 1750. Plánované křídlo jižní se již nerealizovalo.

V téže době bylo dolní nádvoří přeměněno v zahradu. Svažitý terén byl rozdělen do čtyř výškových úrovní, a to výstavbou tří tarasních zídek. Nejvyšší tarasní zídka byla vyzděna z cihel a na vnější straně rozčleněna ozdobnými polopilíři. Základní osu parkové úpravy tvořila spojnice mezi vchodem do severního křídla a vchodem do křídla středního (tedy komunikace mezi oběma refektáři). Tvořila jí cesta, procházející nejspodnější tarasní zídkou. Byly zde vytvořeny dva průchody s kamennými prahy. V dalším pokračování obcházela kašnu, kterou dokládá kruhový kamenný základ. Pomocí schodiště překonávala třetí (cihelnou) tarasní zídku. Prostup nejspodnější tarasní zídkou byl v další fázi omezen na jediný vchod, komponovaný přímo na osu vchodu do středního křídla. I zde ho tvořil kamenný práh. Na tento nový vchod navazovalo schodiště, doložené v terénu jen kamenným podkladem pro tři schodové stupně. Schodiště a cesta byly po stranách lemovány zídkou. Na západní straně byla tato parková úprava lemována vysokou tarasní zdí z kamenů na maltu, která vyrovnávala výškový rozdíl mezi parkem a úrovní horního plata. Zeď v původní podobě směřovala na severozápadní roh středního křídla.

Takto popsaný stav parkové úpravy můžeme konfrontovat s dochovaným plánem koleje, pořízeným v roce 1732. Na tomto plánu je již kolej zachycena v rozsahu, v jakém je dochována dodnes, tedy i se středním křídlem. Parková úprava je zaznamenána v podobě po výstavbě jediného centrálního schodiště. Plán řeší problém, zda schodiště bylo průběžné, nebo zda sestávalo z několika oddělených úseků. Spodní úsek zřejmě vyplňoval vzdálenost mezi spodními dvěma tarasními zídkami, horní začínal v místech dochovaného spodního stupně nad kašnou a končil u horní hrany cihlové tarasní zídky. Plán dále zachycuje schematicky (v pohledu z boku) také kašnu. Plocha po stranách schodišť je členěna systémem pěšin (?) a snad i kruhových záhonů. Plán naopak nezaznamenává tarasní zídky ani zídky, které z boku lemovaly schodiště. Můžeme ho charakterizovat jako schematický, zachycující jen nejdůležitější objekty (schodiště a kašnu).

Archeologický výzkum zaregistroval také zánik parkové úpravy, bezesporu související se zrušením koleje v roce 1773. Kolej tehdy získala armáda. Stavební úprava proběhla v letech 1776-1777. Severní část byla přeměněna na vojenskou nemocnici (špitál) a jižní na kasárna. Zanikla parková úprava s členěním pomocí tarasních zídek. Celý areál byl zplanýrován do jednotné plochy beze stop po nějakém architektonickém řešení. Podobu dolního nádvoří přibližuje indikační skica z roku 1840, která ukazuje na místě původní parkové úpravy přibližně čtvercovou plochu, dělenou cestičkami na čtvrtiny. Další zásahy během 2. pol. 19. století a ve 20. století zlikvidovaly i tuto utilitární úpravu. Konečným výsledkem byla převážně asfaltová plocha, místy snížená pod úroveň úprav konce 18. a první poloviny 19. století. Veškeré stopy staršího stavu odstranilo necitlivé hloubení suterénu pro technické zázemí na jaře roku 2005, které bylo podnětem záchranného archeologického výzkumu.

Jiný vývoj byl zachycen na velkém (horním) nádvoří. Již bylo zmíněno značné snížení původní úrovně terénu až o 5 m. Byla tím připravena stavební jáma, zřejmě pro výstavbu jižního křídla a snad pro plánovanou úpravu nádvoří. Ani jedna z těchto aktivit se však již nerealizovala. Stavební jáma sloužila k ukládání stavebního odpadu. Odlišná situace byla zaznamenána jen v sondě IV, kde byly zachyceny pozůstatky technického zařízení – pece na pálení vápna. Pec byla zasazena na hranu písčité pleistocénní terasy říčky Vrchlice. Půdorys pece má tvar podkovy široké cca 6 m a dlouhé cca 7 m. Podkovovitý plášť pece byl vyzděn z kamene na maltu, vnitřní strana byla provedena z cihel. Chod pec byl zajišťován dvěma asi 150 cm vysokými a 90 cm širokými sklenutými vchody, přičemž tato jediná, vstupní strana postrádala kamennou obezdívku. Do jílové podlahy vnitřního pecního prostoru byly zahloubeny dva souběžné otopné kanály, které vpředu navazovaly na dva plnící otvory a původně patrně sloužily k přívodu vzduchu do pece. Tyto kanály zasahovaly přibližně do tří čtvrtin hloubky vnitřního prostoru pece. Pec byla intenzivně využívána, jak dokládají cihlové vysprávky většiny dolní partie vnitřního pláště. V horní části byl povrch starších cihel žárem často až k nepoznání slinutý. Stejně tak byla slinutá a rozpraskaná vnitřní strana čelní zdi pece. Prozkoumaná situace zachycuje jednokomorovou pec s přímým ohřevem a odtahem spalin v zaniklé horní části. Jedná se o druh vápenice, ve které byly kusy vápence bezprostředně smíšeny s topivem nebo byly uloženy ve vrstvách proložených vrstvami topiva.

Provoz pece nepochybně souvisel s výstavbou Jezuitské koleje. Pec mohla být postavena bezprostředně po zahájení výstavby koleje (po roce 1666). Její provoz byl udržován delší dobu. Kolem pece se vršily haldy stavebního odpadu,

bezprostřední okolí však bylo udržováno na původní úrovni, takže v konečném stadiu se pec nacházela v jakési prohlubni. Kromě stavebního odpadu byl na stejné ploše ukládán i kuchyňský odpad z provozu koleje. Po ukončení provozu byla pec v plném rozsahu zavezena a terén nad ní byl srovnán do úrovně vytvářeného nádvoří. Ukončení provozu nelze z archeologického materiálu určit, na plánu z roku 1732 je na horním nádvoří zachycena zahradní úprava se stromy. Pec již tehdy nefungovala.

Na velkém nádvoří nebyla tedy realizována původní úprava počítající s hluboce zahloubeným nádvořím. Jedinou zahloubenou částí zůstal pouze pás terénu bezprostředně za východní křídlem koleje, na jehož dně byl uložen žlab, shromažďující povrchovou i podzemní vodu z areálu za kolejí. Tento zahloubený pruh terénu byl vymezen dvěma stupni tarasních zdí, které uvedený plán nezachycuje, přestože se dochovaly až do současné rekonstrukce; plán je tedy v tomto detailu schematizován. Jednoduchá zahradní úprava byla po přeměně na kasárna nahrazena nádvořím, částečně (jen ve směru komunikačních tahů) vydlážděným. Ostatní plocha byla vyštěrkována a vyznačovala se velmi ulehlým povrchem.

Zahradní úpravu zachycuje plán z roku 1732 také na tzv. horním platu. Archeologie zde může konstatovat jen rozsáhlou terénní změnu. Původně zřejmě pravidelně svažitý terén směrem k Vrchlici byl navršen do rovné plochy. Vznikl výrazný terénní stupeň mezi horním platem a oběma níže položenými nádvořími za kolejí. Severní část tohoto stupně byla zpevněna opěrnou zdí, která ze západní strany lemovala parkovou úpravu dolního (severního) nádvoří. Hrana mezi platem a velkým (jižním) nádvořím nebyla zřejmě nijak upravena.

Jezuitská kolej v Kutné Hoře je z archeologického hlediska relativně mladým objektem. Záchranný archeologický výzkum ukázal, že výstavba koleje se od počátku řídila jednotným projektem, který byl realizován a dodržován po celé období výstavby v délce několika desetiletí. Parková úprava dolního nádvoří byla realizována pravděpodobně dříve, než mohl být využíván letní refektář ve středním křídle, jehož existenci byla podřízena. Opačné svědectví podává vývoj na horním nádvoří, kde se na původní (blíže neznámý) záměr rezignovalo a uskutečnila se jen nejjednodušší úprava.

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Archaeology of the Post-Medieval period. The current state of research and research perspectives in Southern Bohemia[1)]

Archeologie postmedieválního období.
Současný stav a perspektivy výzkumu v jižních Čechách[1)]

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Gegenwärtiger Stand und Perspektiven der Forschung in Südböhmen[1)]

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Der Aufsatz stellt einen Auszug aus einem vorbereiteten Buch dar, das über die Forschungsgeschichte und Entwicklung in der Neuzeitarchäologie auf unserem Gebiet handelt und neben Verweisen auf die Verarbeitungsstand in den einzelnen Interessensgebieten einen Überblick über die archäologischen Befunde und die studierte Problematik auf dem Gebiet Südböhmens vermitteln soll. Der Beitrag behandelt eingehend fünf thematische Blöcke: die erste Gruppe bilden Sitze, Siedlungen und Bauobjekte, die zweite stellen Gräberfelder dar, eine weitere besteht aus den materiellen Belegen für Arbeit und Produktion, die vierte Gruppe sind Quellen zum Handel, Tausch und Verkehr, und schließlich Informationen über das geistliche Leben der Gesellschaft. Selbständig behandelt wird die Problematik des Wandels der historischen Landschaft.
Neben einer Übersicht des gegenwärtigen Forschungsstandes in der Neuzeitarchäologie setzen wir uns auch mit den Perspektiven des Faches sowie der Spezialisierung Mittelalter und Neuzeit des Faches Archäologie an der Südböhmischen Universität in České Budějovice auseinander.

I. Introduction[2)]

Like other scientific fields, in just over a century of existence archaeology has undergone a qualitative transformation. From its earliest days, when it focused on discovering and collecting artefacts, to its recognition and development as a standard scientific field, and it has ultimately progressed to attain status as a modern science, with numerous sub-disciplines and various forms of multi-disciplinary cooperation.

The earliest focus on prehistoric and early medieval artefacts, a specialisation codified in Government Resolution No. 274 of 12 June 1941, where archaeology was treated as part of heritage conservation, and archaeological findings were defined chronologically as "works by human hand or natural phenomena used by humans, dating from the prehistoric and early historical periods", gradually evolved to cover the periods of the high and late middle ages, with some reach into the study of early modern artefacts. This definition was reflected in Czech legislation, for example, in Act No. 22/1958 Coll., on Cultural Monuments, and especially in Act No. 20/1987 Coll., on State Heritage Conservation, and in the subsequent amendments to these acts. Article 23, paragraph 1 in the Act on State Heritage Conservation states that "an archaeological find is an object (or set of objects) that is evidence of the remains of human life and human activities from the start of their evolution up to the early modern age…" Although the definitions in these acts show that the focus of archaeology on the remains of material culture should

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not be constrained by fixed chronological boundaries, archaeological research on prehistoric and medieval (understood in the field as the early, high, and late middle ages) artefacts and evidence of material culture is a tradition that is incomparably longer – and consequently far more advanced – than research on archaeological objects and materials from the early modern age.

II. Archaeology of the Post-medieval period in the Czech Republic in 1990 –2005

Despite several decades of efforts by archaeology as a scientific field to systematically study the post-medieval period, this has not yet been achieved, even though fieldwork methodology and the study of evidence of material culture in the post-medieval period has much in common with, for example, the focus of the preceding historical period, that is, the high and late middle ages. The Society for Post-Medieval Archaeology was founded in 1966 in England (it is the publisher of the journal *Post-Medieval Archaeology*), but Czech archaeologists only began working on the early modern age in more detail fifteen years later. This change occurred in part because, as the number of archaeological excavations grew, archaeological research increasingly began to take in objects and finds from the post-medieval period, and in part because a growing amount of field excavations began to be carried out directly on building structures from the early modern period. If we add to this the need to analyse artefacts that had accumulated in museums from earlier archaeological excavations, it is natural that even in the Czech Republic a need arose over the course of the 1980s to establish and formulate post-medieval archaeology as an important and integral part of Czech archaeological science.

In 1982, as part of a working group on medieval archaeology, a working group on post-medieval archaeology was set up within the Czechoslovak Archaeological Society (ČSSA) at the Czechoslovak Academy of Sciences (ČSAV). The following year a meeting was organised in Beroun for archaeologists who, within the scope of their professional interest, were also engaged in research on sites and materials from the early modern age. A positive development that followed the presentation of papers at this seminar and the formation of an independent group for post-medieval archaeology at the ČSA ČSAV in 1987 was that in 1990 the Institute of Archaeology at ČSAV in Prague published a special volume of papers devoted specifically to early modern archaeology (*Studies 1990*). This publication contained chapters on archaeological excavations in early modern locations, along with artefacts and examples of inter-disciplinary cooperation, but it also offered the first review of the history of research in this scientific sub-discipline in this country and addressed the subject matter and the problems and perspectives of this field in this country (*Smetánka – Žegklitz 1990*; the study was a follow up to *Žegklitz – Smetánka 1989*). With the definition of its subject matter and its chronological framework the foundations for the further development of post-medieval archaeology were laid. Even fifteen years after the book's publication the basic criteria it contains for determining the locations, the objectives, and the methods of work in post-medieval archaeology are still applicable: "Under the present state of knowledge, post-mediaeval archaeology may be defined as an archaeological discipline indulging in identification, classification, and historical interpretation of material sources of the pre-modern age. In this direction, it may represent a component of a widely understood

group of sciences of humanity. In our context, the relatively wide temporal delimitation of the pre-modern age may be said to include the rimes between c. 1500 and 1800 A. D., bridging thus the gap between the late mediaeval period and the industrial age." (*Smetánka – Žegklitz 1990*, 7) The authors of the study also defined archaeological research on the subsequent period (i. e. the period beginning with the Industrial Revolution) as industrial archaeology (*ibid.*).

This interpretation coincides with the way research on this history of material culture is understood and chronologically defined in some other historical fields, and this also allows for a generally division of the modern age into two stages, of which "the first – 1500-1650 – could be called the period of the formation of the early modern age, still containing many features of its continuous development out of the middle ages, but with the emergence of the earliest features linking it to the next stages of the early modern age, roughly around 1650-1770/90, or 1800, preceding and preparing the way for a fundamental socio-cultural transformation into a modern socio-cultural stage of history. This epoch on the one hand unites the continuous system of 'traditional' culture with the middle ages and, on the other hand, comes increasingly under the sway of the new humanistic principle of 'civilisation' that encompassed cultural behaviour and education in the broad sense of the word within a process that is often referred to as the 'colonisation' of 'traditional' culture." (*Dějiny 1995*, 31).

If one of the most significant tasks of archaeology as a social science is to contribute to the documentation and reconstruction of the life of previous civilisations (communities, socio-cultures) through its specific sources and thus, within the means of its professional capacity, to assist in obtaining an understanding of pre-historical and historical development, then it is necessary to assume that the goals of post-medieval archaeology will be analogical to those of, for example, the archaeology of the middle ages. Unlike other related fields (history, cultural anthropology, etc.), in which the methodology and the content and goals of study in the field have been clearly defined and elaborated over a long period (cf. e. g. a study on the history of material culture and everyday life in the modern age, in *Dějiny 1995*; *Dějiny 1997*), and also unlike, for example, medieval archaeology, which, in terms of its professional scope, content, and goals, has a history in this country that stretches back several decades (cf. *Archaeologia historica*, Brno), systematic archaeological research on the post-medieval period is still in its early stages in the Czech Republic. The authors of the introductory chapter in *Studies in Postmediaeval Archaeology* articulated not only the essential need for the development of this new scientific field, but – on the basis of the current state of research in the field – they were able to note that until the end of the 1980s "its quality [of research on the post-medieval period – *note RK*] is increasing with the general trend of development visible in our archaeology. The source base expands and its quality increases." (*Smetánka – Žegklitz 1990*, 10-11). However, they were also forced to note that "at the time being, there exists no problem-oriented excavations in Czechoslovakia such as that conducted, for instance, in the sphere of mediaeval archaeology; at this initial stage, there are no favourable conditions for such an undertaking (the lack of personnel, for instance)." (*ibid*). In addition to the promising and desirable study of individual aspects of material culture, certain thematic areas had already begun to take shape that had the potential to become the focus of more detailed study using archaeological research methods (post-medieval villages, the remains of early modern military camps, etc.).

If we look back at the past fifteen years since the first work devoted to Czech post-medieval archaeology was published, in many ways we find that

archaeological research on the early modern age has become broader and deeper in scope, that the informative quality of archaeological sources and the documentation of buildings from the post-medieval period have benefited substantially from cooperation with many other scientific fields, that non-destructive research methods are often applied even to early modern sites, and that our understanding of some kinds of post-medieval material culture has progressed. This is certainly partly owing to the massive boom in construction that occurred in the aftermath of the social changes ushered in at the start of the 1990s. Major building activities in the built-up areas of villages and on their peripheries (e. g. massive shopping complexes, technical infrastructure, renovation and reconstruction of historical buildings and built-up areas, etc.) and the construction of brand-new buildings, which are irrevocably transforming the shape of the historical landscape (highways, factories, and other large production complexes, often built on greenfields outside the village, etc.), generated not only an increased need for archaeological field work but also brought about a qualitative transformation of the structure and methods of work of contemporary archaeological heritage conservation. The number of professional institutions employing archaeologists multiplied, but there also emerged new facilities, which devote a substantial part of their effort to the field word in archaeological conservation (for more on this issue as it pertains to Southern Bohemia, see *Krajíc 2003*). The quantitative growth in archaeological work also ushered in the need for a more detailed study of the post-medieval period. Archaeology of the early modern age consequently became part of the complex study and documentation of both isolated structures and whole settlement complexes and of treated, not yet built-on, areas and larger landscapes. This resulted in more intensive interdisciplinary cooperation on the study of the history of settlements. For example, the historical, architectural, and heritage interests in buildings from the medieval and early modern periods are closely connected with the interests of medieval and post-medieval archaeology. The study of analogical structures and thematic areas using the specific methods of these fields makes it possible to combine and coordinate new techniques aimed at the protection and conservation of this aspect of cultural-historical heritage. A general example is the cooperation of archaeologists on research and surveys of historical structures (cellar fill, research on the underground sections of structures, un-built on sections of land etc.) or their participation on topics that are typical for other scientific fields (the history of technology, architecture, the military, settlements, etc.). A positive development from this kind of cooperation has, for example, been the conferences that have been organised on the issue of historical-structural research, launched in 2002 at a meeting in Zahrádky, near Česká Lípa, when the focal topic was the development and function of furnaces (*Svorník 1/2003*). At subsequent meetings archaeologists specialising in the medieval and early modern periods also took part. The topic at the second meeting in Nové Hrady in 2003 was the issue of the form, structure, and historical development of doors and windows (*Svorník 2/2004*). Another meeting, held in Třebíč on 8-11 June 2004, focused on the topic of historical roof frames and roofs (*Svorník 3/2005*). Post-medieval archaeology has also benefited from the publication of the proceedings from conferences held since 2001 in Nečtiny near Plzeň and devoted to the "history of structures" (*Dějiny staveb 2001*; *2002*; *2003*).

It is impossible today to imagine any longer the archaeological study of the early modern age without close cooperation with many other scientific fields. Other fields are involved in archaeological prospecting and field surveying

and are increasingly used in analyses of finds. How much qualitative progress has been made in this area in the past fifteen years is outlined in a publication on the changes in the historical landscape from the perspective of contemporary archaeological research (*Gojda 1997*; *2000*) and in a thematic overview of the application of non-destructive methods of archaeological research (*Kuna et al. 2004*), and the involvement of the natural sciences and other disciplines in archaeological field excavations and in the processing and assessment of archaeological material. In this regard an increasingly more important role is played by the regular meetings of archaeologists with experts from other scientific fields at conferences run under the title "Methods from the Field of the Natural Sciences in Archaeology and Anthropology", which have been organised for a number of years, and especially in recent years archaeologists, natural scientists, doctors, engineers, applied scientists, and others have been pursuing cooperation on other qualitatively different bases. A summary of the areas of shared interest is presented in the publication "Ve službách archeologie" [In the Service of Archaeology], a series with seven volumes to date, testifying to the quantitative and qualitative progress in cooperation in such areas as archaeo-geophysics, aerial surveying, geo-archaeology, paleobotanics, paleozoology, anthropology, metallurgy, etc.

Another thematic area that is of focal interest to post-medieval archaeology is research on historical production facilities and the study of contemporary technology. The archaeologists at the Technical Museum in Brno are responsible each year for organising a national seminar on the subject "Research on Production Structures and Technology Using Archaeological Methods". These seminars also produce publications of the same name, in recent years published under the abbreviated title *Archeologia technica* (No. 17, the most recent issue, was published by the Technical Museum in Brno in 2006). Early modern structures that have been the focus of research include baking kilns, limekilns, glassworks, tilt hammers, metalworking and metal-casting facilities. Presentations have been made of the results of analyses of raw materials, iron products, coloured and precious metals, semi-finished products, and garbage.

A general overview of archaeological research on the post-medieval period would not be complete without mentioning that archaeologists also obtain important information from historical journals and publications on the period of interest and topics of study in related scientific fields (*Zprávy památkové péče* [*Heritage Institute Reports*], Prague; *Muzejní a vlastivědná práce* [*Museum and National Science Studies*], Prague; and since 1994 *Průzkumy památek* [*Monument Surveys*], Prague, and many other works).

An essential function is occupied by the main archaeological journals and regional historical-archaeological scholarly literature, in which archaeological studies and the material culture from the post-medieval period are increasingly represented. Given that the archaeology of the early modern age is directly connected with its closest related discipline – the archaeology of the middle ages – it is understandable that their professional interests often overlap, and the content of their work can often reflect this fact. Consequently, it is not unusual for the archaeology of the middle ages to touch on the chronologically later period and conversely the archaeology of the post-medieval period will also take in the preceding historical period. This is especially evident in the archaeological excavations on localities with uninterrupted development stretching from the middle ages into the modern age (towns, castles and palaces, fortresses, etc.) and where, only for formal reasons, it is not possible to separate the study of one

from the other. Archaeological findings on the post-medieval period are often included in publications and journals that focus primarily on the archaeology of the middle ages. Examples of such publications are *Archaeologia historica*, *Castellologica bohemica*, *supplementum 2 of Památky archeologické Mediaevalia Archaeologica Bohemica 1993*, the thematic series published by the Institute of Archaeology of the Academy of Sciences of the Czech Republic in Prague titled *Mediaevalia archaeologica*, *Ruralia*, and other publications.

Despite the amount of field excavations and publication outcome, it has not yet been possible to establish regular contact among archaeologists whose professional interests include research on the post-medieval period and others interested in the field (e. g. archaeologists and students of archaeology specialising in this area) at national meetings. Occasional activities have included, for example, a seminar on archaeological research of the early modern age and the present, which was held on 25-27 November 1999 in Opočno. Despite all the positive aspects mentioned above in the development and in the enhancement of archaeological knowledge on the post-medieval period in the past fifteen years, it must therefore still be said that the systematic study and cooperation between specialists at the national level, for example, by means of regular conferences or the publication of specialised national journals, has not yet been achieved.

		Period second half of the 15th – 19th century		
		Areas of research		
I. Residences, habitation sites, built-up features	**II. Burial rites**	**III. Employment**	**IV. Trade, transport, exchange**	**V. Spiritual lifeand its reflection in material culture**
1. Towns	1. Burial sites	1. Trades	1. Local, long-distance roads	
2. Royal and aristocratic residences	2. Atypical burials	- pottery	2. Material culture	
3. Villages	- mass	- stove-building		
4. Monasteries and churches	- individual	- brickmaking		
5. Short-term and spec. settlement	3. Specific features	- smithing		
	- execution site	- metal casting		
I/A. Habitation background	- gallows	- beltmaking		
1. Supply and use of water		- assaying		
2. Waste heaps		- prospecting		
3. Economy		- bell-making		
4. Roads		- glass-making		
5. Fields, gardens		2. Other professions		
		- scribe		
I/B. Archaeology of the landscape		- urban official		
		- merchant		
		3. Material culture		

Tab. 1. Archaeology of the post-medieval period in Southern Bohemia – current research themes.
Tab. 1. Archeologie postmedieválního období v jižních Čechách – stávající okruhy bádání.

III. Archaeology of the Post-medieval period in Southern Bohemia *(tab. 1)*

Reflecting on the standing and the development of archaeology of the early modern period in the Czech Republic in the past fifteen years, I must necessarily also ask how this trend has been reflected in archaeological research in Southern Bohemia. However, given that this question has not yet been complexly addressed even in Southern Bohemia, I will take the liberty to present – as inspiration for further study – at least a selective overview of the research of sites and artefacts that have surfaced in thematic subject areas and have emerged in the study of individual components of the history of material culture in Czech and Southern Bohemian post-medieval archaeology. (Note: In the cases where the studies cited below have not yet been published in greater detail, in brackets I cite the institution that conducted the particular activity.)

III. 1 Habitation and settlements *(tab. 2)*

III. 1.1 Habitation connected with royalty, the nobility, and the church

A general description and examples in the Czech Republic:

It is not within the scope of this text to address in detail archaeological research on places of habitation in the early modern age that were built in the middle ages and then became defunct or developed further in the post-medieval period (medieval towns, castles, palaces, and other dwellings inhabited by royalty, the nobility, and the Church). It is only possible to cite the literature listed in Chapter II, which in specialised volumes, monographs, and regional press – usually accompanied by the historical and structural development of individual buildings and monuments – deal with the topic of archaeological research on the medieval and early modern periods. Just as a supplementary selection it is possible to list other scholarly works, usually published as surveys or summaries or as encyclopaedias, relating to historical-archaeological perspectives

A. Residences and habitation sites
1. Towns: Bechyně, Benešov nad Černou, České Budějovice, Český Krumlov, Jindřichův Hradec, Milevsko, Písek, Planá nad Lužnicí, Prachatice, Sezimovo Ústí, Soběslav, Strakonice, Veselí nad Lužnicí, Vimperk, Vodňany
2. Royal and aristocratic residences (castles, châteaux, strongholds, farmsteads) chateau in Bechyně, Landštejn castle, castle in Vimperk, castle in Strakonice, Kestřany strongholds, Orlík castle, Hus castle, castle and chateau in Český Krumlov, castle in Tábor, Choustník castle, chateau in Třeboň, Zvíkov castle and surrounding settlement
3. Villages Češnovice, Dolní Třebánek, Jenišovice, Laziště, Palčice, Přívořany, Ročovice, Šiřice, Tališovice
4. Religious structures **Monasteries:** Bechyně, Milevsko, Zlatá Koruna, Vyšší Brod **Churches:** in Křtěnov, St. Nicholas in České Budějovice, Church of the Offering of the Virgin Mary in České Budějovice, St. Václav in Písek, in Hroby, in Chýnov, cemetery church of the Holy Trinity in Písek, cemetery church of Sts. Phillip and James in Tábor **Jewish synagogue:** in Tábor
5. Short-term or specific settlement **Fortifications and military camps:** Volary ramparts, fortifications by Soumarský most (Packhorse Bridge), modern border fortifications, Tábor - Pintovka, fortifications near Strážné, Kostelík near Písek, Těšovice, near Zahájí **Other:** hermitages, rock overhangs, caves

Tab. 2. Archaeology of the post-medieval period – locations in Southern Bohemia studied to 2006.
Tab. 2. Archeologie postmedieválního období – jihočeské lokality zkoumané do roku 2006.

on buildings and habitation from the post-medieval period (*Durdík 2002*; *2002a*; *2005*; *2005a*; *Foltýn et al. 2005*; *Kuča 1996*; *1997*; *1998*; *2000*; *2002*; *2004*; *Musil – Plaček 2003*; *Musil – Plaček – Úlovec 2005*; *Pešta 2003*; *2004*; *2005*; *Plaček 2001*; *2002*; *Úlovec 2001*; *2003*; *2005*; *Vlček 2001*; *2006*; *Vlček – Sommer – Foltýn 2002*).

Southern Bohemia:

A positive feature is the increasing intensity and development of cooperation between archaeologists and architects and building historians on research on buildings that are still standing. Some examples from Southern Bohemia include research on reconstructed or even demolished buildings or building tracts, where archaeological surveys or excavations have been conducted or where archaeological prospecting was part of the structural-historical assessment of the building. Such work is going on continuously in the historical centres of the towns of České Budějovice, Český Krumlov (e. g. house no. 15 on Náměstí Svornosti (Svornosti Square), house no. 74 on Široká Street, house no. 27 and no. 29 on Radniční Street – *Ernée 1995*; *1999*; *2000*; *2001*; *Ernée – Gabriel 2001*; excavation by the Český Krumlov Museum conducted on house no. 2 on Svornosti Square, no. 15 and no. 55 on Latrán, no. 23 on Rybářská Street, etc.), in Bechyně (house no. 37 on Klášterní Street – the basic features of the house and the lot are described in *Krajíc 2003a*; *2000*, 9-11; the discovery of artefacts in a house on TGM Square, defunct since the 17th century – excavation by HM Tábor), Jindřichův Hradec, Milevsko, Písek (among the many examples, mention can be made of the excavation on the area between the town walls and beneath the Baroque barracks – in *Dohnal – Fröhlich 2000*; excavation on Čechova Street, where pottery from the early modern period was discovered – *Fröhlich 2001*), Prachatice (excavation on the historically built up areas and on many parts of the town's fortification system – *Beneš 2001*), Soběslav (excavation in 1986 on a site of the demolished northern end of the square – *Krajíc 1988-1989*; in 1998 excavation on early modern urban construction on the site of the un-built on parts of a defunct castle was studied – excavation by HM Tábor), at present research has been under way for several years on a block of buildings by the main square in Vodňany (the excavation is being conducted by Archaia Praha o. p. s. in cooperation with the Museum of the Central Otava River Basin in Strakonice), and other locations include Benešov nad Černou (*Hrubý 1999,*), Vimperk, and ongoing archaeological work in the historical centre of the town of Tábor (*Krajíc 1997*; *1998*; *2006*; *2006a*) and elsewhere.

III.1.2 Villages

A general description and examples in the Czech Republic:

A new area of archaeological research, which evolved out of some rare similar examples in the preceding period (e. g. *Richterová 1981*; *1982*), is research on villages from the early modern age (*Vařeka 1992*; *Nováček – Vařeka 1996*). Since the 1990s this area of research has concentrated on several main themes. In connection with the study of the development of historical landscapes, now deserted villages from the early modern age, or the individual buildings they contained, are studied from an archaeological perspective and detected using special prospecting methods (such as applied non-destructive methods). The economic and services background of the area, such as the village's agricultural lands, gardens, roads, etc., is also studied and, in the case of building ruins the ground plan of the original building, the typical ground-plans

of municipalities, and even the interior arrangement of individual farm buildings are mapped. The second area of interest is research on villages that have continued to exist to the present. Even on these, archaeological methods can be applied to show what kind of structural changes the village went through during centuries of development.

One thematically specific project currently under way is the archaeological research on buildings transformed as part of the construction of the Museum of Folk Structures in Vysoký Chlumec (a branch of the Mining Museum in Příbram, the catchment area of the central Vltava Basin). The research is focused on post-medieval and recent development of farm sites. Detailed research has thus far only been conducted on farm house no. 4 in Obděnice in the Příbram region (*Dohnal – Korený – Procházka – Šamata 2001*) and on a farm from the 18th century, house no. 3, in Arnoštovice in the Benešov region. A unique piece of research is the one on villages that became defunct over the course of the 19th and 20th centuries. Field surveying was conducted on the settlement of Pohlberg, lying within the cadastral unit of Lučany nad Nisou, approximately 2.5 km east of Jablonec nad Nisou. Here prospecting uncovered material from the second half of the 19th century to the middle of the 20th century. The village's demise is placed sometime between 1950 and 1970 (http://www.quido.cz/130/pohlberg.htm).

Southern Bohemia:

Knowledge about the historical development of late medieval and early modern villages benefits substantially from archaeological research in Southern Bohemia, where both of the study trends cited above are pursued on late medieval up to the more recent period, and it must be noted that both streams of research have produced significant finds and form an integral part of the comprehensive study of settlements and the historical transformation of the landscape.

The first thematic area focuses on deserted villages. The tradition of research on defunct medieval villages, especially in the Tábor region (*Krajíc 1980*; *1983*; *1984*; *1987*; *Krajíc – Soudný – Eisler 1984*; *Smetánka 1965*; *1967*; *1970*), Písek region (*Fröhlich 1986*, 91-99, esp. note 1) and the Budějovice region (*Kovář 1995*) has evolved in recent decades into research on villages that became deserted during the early modern age. The research is primarily directed at locating defunct settlements, making a topographical map of the sites, and field prospecting. Examples include the village of Palčice u Údraže in the Písek region, earliest mention of which in written sources dates from 1470; it probably became defunct during the 16th century (perhaps before 1528, first cited as deserted in 1575 – *Fröhlich 1986*, 91). The ruins of the defunct village and its surrounding environs were documented and a detailed field survey was conducted. Among the findings were that archaeological excavation found evidence of an older settlement in the immediate vicinity of Palčice, which predated the late medieval settlement by at least two centuries (*Fröhlich 1986*, 91-99).

Similar findings were obtained from excavation on the deserted village of Jenišovice, the ruins of which were identified 3.5 km northwest of Milevsko within the cadastral unit of Něžovice (the former district of Písek). Although earliest mention of the village in written sources only dates from 1575 and not long after that it became defunct (in 1580 a courtyard is cited in its place), archaeological field surveys produced material evidence of local settlement from the middle of the 13th up to the 16th century. Because the number of archaeological finds at this location is considerably higher and covers a broader area during the earlier medieval settlement (13th–14th centuries), there

is cause to believe that this reflects historical developments, wherein – owing to as yet unknown reasons – in the 15th-16th centuries the area of the settlement decreased in size. However, Jenišovice nonetheless continued to exist as, in a sales contract in 1575, the village is listed in its entirety (*Brom 1992*).

One newly identified site is the deserted medieval village of Přívořany u Lišova, which is first mentioned in written documents in 1387, and which is located on the estate of Hluboká. Its demise is dated as sometime between the Hussite wars and 1467. The remains of six farms and parts of the village's agricultural lands were localised and documented in 1992 (*Kovář 1992*).

Another deserted village in the České Budějovice district shows evidence of a relatively long period of existence – the settlement of Tališovice near Svatý Jan nad Malší. It is assumed that it was founded during the 13th century, and its demise is recorded in written documents as the year 1592. At that time, as a small settlement of four (and later only three) farms, it was annexed to the noble court of Stachov and the serfs were settled at a different location in the Nové Hrady demesne. The village was recently localised through field surveys (*Kovář 2001*).

The sudden demise of several villages in the Netolice region occurred in connection with historical events at the end of the 16th century. In the forests around Leptač court, Vilém of Rožmberk had a game preserve for rabbits created in 1579, which covered an area of almost 22 km. The fort that Jakub Krčín of Jelčany and Sedlčany left Vilém of Rožmberk inside the reserve was reconstructed into a renaissance manor and renamed Kratochvíle. The creation of the game preserve led to the demise of several villages or parts of villages in 1579. The owners of the farms were given new property and financial compensation. Among the villages listed are Šitice, Ročovice, Dolní Třebánek and Horní Třebánek, Krtely and part of the villages of Hrbov, Třebanice and Žitná. In the 1980s archaeological research was carried out on the grounds of the former preserve, three of the original villages were located and identified, and material for dating was obtained from the sites (Šitice, Ročovice, Dolní Třebánek – in *Fröhlich 1990*).

The second thematic area is the study of the life and the historical-structural development of more recent villages. As part of the research project mentioned above, archaeological excavation has been carried out in two villages in Southern Bohemia.

In Češnovice, in the České Budějovice region, in 1995 archaeological rescue excavation was conducted on the site of farm house no. 13, which revealed two earlier stages of settlement beneath the early modern structure (*Militký 1996*; *Militký – Vařeka 1997a*). The older of the two is evidently the ruin of a wooden chamber that would have been part of the farm that stood on this site from the 14th century and was destroyed by fire, probably during the war, sometime around 1468–1470. After 1490 reconstruction was carried out on a building of which only parts of the stone walls have survived. Although the village, which was originally part of the royal estate of Hluboká, is not mentioned in written records until 1409, archaeological findings show it was founded in the second half of the 13th century.

In Srlín, in the Písek region (earliest written records date from 1218), excavation uncovered an archaeological situation that reveals the complexity of the development of the village's layout and structural development over the course of the early modern period (*Dohnal – Vařeka 1997*). On the site of what is today house no. 39, where a timber building structure stood from 1789, rescue excavation in 1995 uncovered two earlier stages of settlement that have a completely different layout than the current farm on the site. The older

structure burnt down, evidently during the Thirty Years War. In its place a new farm building was built with the same ground plan. That, too, burnt down, evidently at the end of the 17th or in the early 18th century. Neither of these structures can be identified as the feudal farm registered in the land registers for 1692–1774. The later construction no longer respects the layout of the older structures. The archaeological excavation and an analysis of written sources indicate that, evidently in the aftermath of the effects of the Thirty Years War, the village took on a new appearance, with no connection to the earlier settlement structure. Srlín only acquired a more stable layout in the late 18th and early 19th centuries, when forty new buildings were built there.

New research directions and new opportunities in the sphere of environmental archaeology are suggested by the research on corn cultivation in the village of Laziště in the Prachatice region, where archaeological rescue excavation was carried out in 1997. During the excavation a building from the 18th century in the southern part of the village square was studied, which was silted with 40 000 carbonised grains (*Beneš – Kočár 2000*).

III. 1.3 Evidence of specific settlement types and short-term settlement

A general description and examples in the Czech Republic:

This category usually includes buildings that diverge from the standard structure of medieval or early modern settlement corresponding to the concept of long-term or permanent residence at a single particular location. Examples of this include military camps, fortification systems, border, highway and trade route controls, and also short-term dwellings (e. g. housing for seasonal, temporary, labourers) or makeshift dwellings designed for a specific purpose (hermitages, caves, cliff overhangs).

Among these different forms of short-term inhabited and functional buildings, the field remains of historical warfare are the ones that have been studied in most detail. Archaeological research on medieval military camps and the preserved remains of fortification systems in the field, which has been developing since the mid-20th century (*Drobná 1953*; *Krajíc – Klučina 1987*; *Meduna 1985*; *Kypta – Richterová 2003*; *2004*; *2004a*), has in recent years also evolved into research on analogical sites from the post-medieval period. The first archaeological field excavation on a camp from the Seven Years War (1756-1763) was on a site located in Nebesa near Aš in 1980–1984, where experts from a number of fields took part in the evaluation and complex examination of the site (*Matoušek – Hájek – Kubů – Meduna 1990*; *Hájek – Kubů – Matoušek 1992*). The archaeological perspective of research on early modern historical-military issues from the archaeological perspective is presented in a study focusing on the morphology of field fortifications and determining types of fortification systems in field surveying (*Meduna 1990*). Recently studied locations include the field fortifications from the 18th-19th centuries in Poplze in the Litoměřice region (*Smrž – Meduna – Brůna – Křivánek 1999*), surveys of battlegrounds from 1647 at Třebel (*Matoušek 2003*; *2003a*; *2004*; *2004a*; *2005*), and at the "Swedish Ramparts" (*Švédské šance*) near Kynžvart Castle (*Matoušek – Kovandová 2005*).

Southern Bohemia:

The number of newly localised and studied military sites, especially from the early modern period, is also increasing in Southern Bohemia. An important

contribution to the knowledge on early modern fortification systems was the survey of fortifications and checkpoints that were built along the southern border of the country during the late medieval period and especially after the Thirty Years War (*Fröhlich 2000*). These sites were built to prevent, when necessary, the entry of foreign armies or undesirable persons into the country and to stop cattle and stolen property from being taken outside the country. Field surveying in the Nové Hrady mountains and in the Šumava mountains has thus far identified twenty military sites, most of which date from the 17th century. Some were built on older, medieval, sites and it was not unusual in earlier periods for them to be repeatedly used and improved. Military and sentry buildings were built at strategically important locations, especially near mountain passes or along the "Golden Path" and elsewhere. Some of the military stations have been archeologically analysed and selected ones have been reconstructed and opened to the public.

An example of a surviving field fortification that provided quality military finds is the redoubt and bastions at the location of the ramparts in Soumarský Most on the Teplá Vltava River (*Fröhlich 1986a*; *1996*; *2000*, 288; *Beneš – Kubů – Török 1995*). The Volary ramparts are located on a mountain pass among the peaks of the Šumava mountains along the Prachatice branch of the "Golden Path", or today along the road from Volary to České Žleby. This is an infantry redoubt on a square ground plan that is 41 x 41 metres in area, and with a usable interior space of 21 x 21 metres in area. Bastions were attached to its northeast and southwest points and used as artillery positions for two cannons. The length of the main axis, including the bastions, was 80 metres. Depressions were discovered at the centre of the bastions, interpreted as holes for munitions. The surrounding ditch reached up to 6 metres in width and 2 metres in depth. An important finding for the history of early modern warfare was a set of iron objects, which contributed to creating a better idea of the kind of equipment contained in a military camp and the gear and armour used by individuals. Although most of the metal finds were obtained through amateur survey, and thus their value has been diminished by the loss of detailed knowledge about the archaeological situation they were found in, they nonetheless represent one of the most complete collections from early modern military camps in this country. Some of the most important discoveries were military paraphernalia and pieces of armour, such as face plates, pieces of plate armour, safeties for muskets or arquebuses, musket rests, ammunition tongs, cannon ammunition, forged pointed infantry pikes, spurs, stirrups, and horseshoes.

The ramparts at Volary were built, run, and maintained from the end of 1618 to the end of 1620. However, it is not entirely clear who exactly had the redoubt and its bastions built – whether the Habsburg empire, to ensure safe access to Bohemia, or the Czech estates, for its defence. The second option is regarded as more likely, but the site was taken by the empire and occupied in the winter of 1618–1619. Although the opposing sides alternated their hold on the fortification several times, the site remained mostly in the hands of the empire. After the Battle of White Mountain this location became strategically insignificant and was not longer used for military purposes.

One of the stations on a vast military camp dating from the start of the Thirty Years War survived in the outskirts of the town of Tábor, on the south side just beyond the Lužnice River in Pintovka woods (*fig. 1*). Tábor was on the side of the estates from 1618 and during the next three decades it was twice besieged and taken by the imperial army (1621 and 1648). The first siege was led by the

imperial general Marradas. It lasted from 19 November 1620 to 18 November 1621, when the town surrendered and was subsequently plundered (*Thir 1895*, 101-121). On the events at this time, written records and even a detailed plan of the camp have survived. The map shows the artillery position in Pintovka, which has survived to date in the woody terrain. In the past year detailed documentation of the location was made and archaeological excavation on the site is currently in the stage of preparation. In the woods, on a promontory along the left bank of the Lužnice, just opposite the castle in Tábor, it is still possible to make out a plateau, slanting slightly in the direction of the town, which is 42 x 46 metres in size. It is protected on all three sides by steep cliffs. There is a deep ditch that is currently 3.3 metres in width on the only accessible side on the west. Connected to the ditch there is a 53-metre long bulwark, now 2-6 metres wide and 2 metres high. Oval and rectangular depressions, reaching on average 2-4 metres, have survived in the enclosed area, especially in the southwest part.

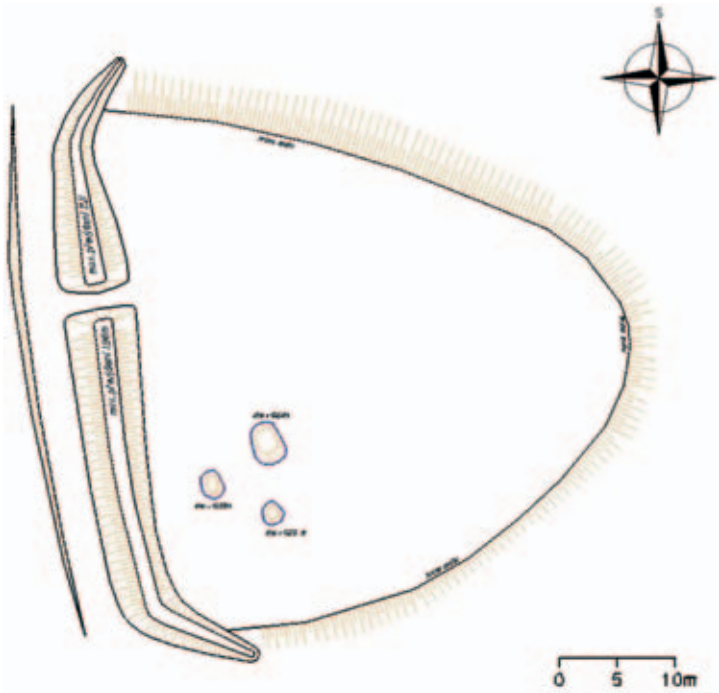

Fig. 1. Tábor – remains of a reinforced gun position from 1621 in Pintovka forest on the opposite side of the Lužnice River. Documentation from the Hussite Museum in Tábor 2005.
Obr. 1. Tábor – relikty opevněné střelecké pozice z roku 1621 v lese Pintovka za řekou Lužnicí. Dokumentace Husitského muzea Tábor 2005.

In the 1990s a military-type structure was documented in Těšovice in the Prachatice region, not far from the intersection of the Prachatice–Vodňany motorways (*Beneš 1996*). In the woods here a 28 x 28 metres square enclosure still exists, which has an embankment and ditches surrounding an inner area of 19 x 19 metres, with the entrance from the north. The site is understood to be an early modern cannon battery, estimated as dating from the start of the Thirty Years War, or from the period of the War of the Austrian Succession, probably connected with the Battle at Zahájí in 1742. A more precise dating and interpretation of field remains will be possible after archaeological excavation has been conducted on the site.

Similar in shape to the site mentioned above is an embankment discovered 1.5 kilometres northeast of Písek on a peak named Kostelík (on the land of the village of Vrcovice). The outer ground plan covers an area of 15.8 x 14.5 metres, the rampart reaches up to 2 metres in height and surrounds an empty area of 6.3 x 5.4 metres, with the entrance on the northwest side. Among the possible interpretations of the site's function, it may have been a military-type (sentry post?) structure that may be connected with historical events mentioned in Těšovice (*Fröhlich 1997*).

There is a surviving early modern fortification in the forest reserve called "Řídká blana" on the land of the villages of Zliv and Zahájí in the region of České Budějovice (*Kubů – Zavřel 1988*). An analysis of written records and the archaeological situation revealed that these are the remains of a fortification used by the Austrian army in the Battle at Zahájí on 25 May 1742. This military battle was part of the War of the Austrian Succession (1740–1748) in which, at a cost of territorial losses, Maria Theresa defended the hegemonic position of the Habsburg domains. In the first stage of the war the united French, Bavarian, and Saxon armies captured Prague and a substantial part of Bohemia. The Austrian army was driven back into Southern Bohemia, and it waited out the winter in the area around České Budějovice. When in March 1742 most of the troops camping here withdrew to Moravia, the remaining contingent of nine thousand soldiers, led

by Prince Lobkovic, surrounded and laid siege to Hluboká Castle. The army took up a position in the camp at Zahájí, where it was covered on its left bank by a pond (probably Bezdrev) and on the right by a constructed embankment. When, on 17 May, at Chotusice the Prussian King defeated the Austrian army, Frederick II of Prussia called on the French to take advantage of the situation and they conquered Lobkovic's camp and thus put an end to the siege of Hluboká. When Prince Lobkovic heard about the planned attack, he abandoned the old camp and had a new one built to the west, where he waited for the French assault. Despite the initial advantage of the French army, the battle on 25 May 1742 at Zahájí concluded without a clear victory for either side. At night, Lobkovic withdrew to České Budějovice, and thus the French took control of the battlefield and freed Hluboká, but it was only a minor success that had no impact on the course of the war. On the contrary, the Austrian army gained the initiative in June when it quickly conquered all of Bohemia and drove out the French and Bavarian armies. The remains of the military camp in the forest at Zahájí are connected with the first Austrian camp, which stretched between Bezdrev pond on the left and the 2.5-kilometre embankment on the right. The rampart fortification that has survived to date in the forest reserve at Zliv is the same fortification cited in written records as "eine Verschanzung".

Another site linked to the same historical events is a redoubt that has survived and was one of three originally built on the outskirts of the town of Písek in 1742. It may be that this site – 650 metres southeast of the town – is just a renovated and improved fortification that Mansfeld had built here in 1619 during the siege of Písek (*Fröhlich 1987*).

A specific type of provisional or temporary dwelling are hermitages and caves or rock overhangs. Survey on such sites has recently turned up findings dating from the early modern period (*Fröhlich 1998*; *2000-2001*; *Fröhlich – Chvojka 2000*).

III. 2 Burial grounds

A general description and examples in the Czech Republic:

Archaeological research on early modern burials and burial grounds has evolved in several directions, of which the most prominent is the field excavation and documentation of individual graves and parts of, or entire, burial grounds (*Blažková-Dubská 2005*; *Hanáková – Martinec – Vyhnálek 1975*; *Omelka 2003*; *Kostka – Šmolíková 1998*; *Kovárník – Horáčková – Vargová – Mucha – Vachunková 2006*; *Wallisová 2002*) and the study of the development of burial rites (*Blažková-Dubská 2005a*; *Rubinková-Králíková 1999*; *Tomková 2005*; *Unger 2000*; *2002*; *2006*). An important part of this form of specialised study is research on graves of the nobility (*Bravermanová 2003*; *Vlček 2000*). In recent years cooperation between archaeologists and natural scientists has developed for the purpose of making detailed anthropological analyses of skeletal remains uncovered during archaeological excavation, family graves, chapels, etc. (*Blajerová 1980*; *1999*; *Cimbůrková 2004*; *Drozdová – Beran 2003*). This research concentrates not just on determining the age and sex of the buried, but also on reconstructing their original appearance (*Drozdová – Veselovskaya 2004*; *Drozdová – Vachunková – Kala – Veselovskaya – Benešová 2005*; *Vlček 2000*) and determining the presence of disease, injury, or another anomalies, which can be detected on the skeletal remains (*Jarošová 2005; Vargová – Horáčková 2005*; *Horáčková – Vargová 2006*). In some cases it is possible even to reconstruct the burial clothing, jewellery, etc.

(*Beranová 1989*; *Bravermanová – Kobrlová – Samohýlová 1994*; *1995*; *Loskotová 1999).* Recently also an earlier tradition of the study of devotional items (*Přibyl 1931*; *1937-1938*) has been developing, which examines the various accessories that accompanied a burial in the early historical period, especially in the 17th century (a representative collection from Prague taken from Šporkova Street; also, e. g., *Cimbůrková 2005*; *Králíková 2004*).

Execution sites from the early modern period are a specific area of research connected with the study of early modern criminal law, capital punishment, and sometimes even anomalous forms of burial (the way the remains of the deceased are treated). For example, recently, archaeological excavation on the site of a gibbet in Bečov nad Teplou (defunct since 1765) formed the basis for a review of domestic and foreign interdisciplinary research on this topic (*Sokol 2003*).

Fig. 2. Bechyně – monastery. Early modern graves of monks in the area of the garth. Archaeological excavation by the Hussite Museum in Tábor in 1997.
Obr. 2. Bechyně – klášter. Novověké pohřby mnichů v prostoru rajské zahrady. Archeologický výzkum Husitského muzea Tábor v roce 1997.

Southern Bohemia:

Research on early modern burials in archaeological sites in Southern Bohemia can be divided into several groups. These include research on burial grounds and graveyards, the study of individual and group graves outside burial grounds and are connected with military or other specific historical events (e. g. epidemics), atypical burials, and finally research on sites that are connected with the administration of penal law and capital punishment.

Important findings relating to burial methods, burial clothing and devotional items, especially from the 17th-18th centuries, were produced by archaeological excavation conducted in České Budějovice, where – in the years 2001 and 2005 – during reconstruction on Kanovnická Street and U Černé věže Street, research was conducted on a part of the town cemetery near the Church of St. Nicholas (kostel Sv. Mikuláše), which was used as a burial site between the 13th and 18th centuries (*Thomová 2005*). The last burial took place here in 1784 and that same year the cemetery was closed. The deceased at this site were buried in wooden coffins, placed on their backs, with their heads facing west and their hands folded across their chest or stomach. The remains of original burial clothing discovered at the site included metal and glass parts of headdresses, buttons, fasteners, buckles, decorated materials; other personal items included wooden, metal or glass rosaries, coins, medallions, and crosses. In 2005 the early modern burial vault beneath the Chapel of the Mortal Anguish of the Lord (kaple Smrtelných úzkostí Páně) was examined with a special probe and documented with a micro-camera, without opening the entrance to the vault (excavation by the Museum of Southern Bohemia in České Budějovice).

Archaeological excavation was also carried out on the town graveyard and part of the Church of the Sacrifice of the Virgin Mary (kostel Obětování P. Marie) on Piaristické náměstí in České Budějovice in 1993–1995 (*Thoma 1996*). Several dozen burial pits and the layers of graves indicate that the site was used for burials from the 13th to the 18th century.

During archaeological excavation on the Church of St. Prokop (kostel sv. Prokopa) in Křtěnov u Temelína in 1995, one of the finds was a burial in a wooden coffin. On the right foot of the skeleton the remains of a leather shoe were discovered,

and on the right hand a silver ring from the 16th century with an inscription interpreted as a kind of magical charm (*Thomová 2004*).

In 1997 archaeological excavations were conducted in the elysian courtyard of the Franciscan monastery in Bechyně (*fig. 2*). It is known from written sources that there were burials in the monastery after its renovation at the end of the 15th century and especially during the 16th and 17th centuries. During the early modern period the space of the elysian courtyard was also used for burials, and during the excavations fifteen graves laid out in several rows were examined. The deceased were buried in deep burial pits with their hands folded in their lap or at the waist and without any devotional items or accessories with which they could be identified by archaeological means (*Krajíc 2000*, 46, 48).

In Český Krumlov two early modern burial grounds were examined in the past decade. The first was discovered in 2000 during reconstruction of the technical infrastructure on Plešivecká Street in front of house no. 481 and house no. 482. A total of eleven graves from the 17th and 18th centuries were discovered. In addition to graves that evidently followed the Christian burial rite, there were several that differed significantly with regard to the way the bodies were laid out and in terms of other features. The first was grave no. 10, where the skeleton of a man 169 centimetres in height and between the age of forty and fifty was found lying in a small deep pit, almost in a sitting position. The skeleton showed signs of having multiple injuries to the head. Multiple partially healed gashes were observed on the crown of the skull, and above the left eye there was what an archaeological assessment deemed to be a depression in the skull, the result of a blow from a blunt object. Another four graves (nos. 3, 8, 9 and 11) were unusually laid out in a north-south direction. One of these also revealed the most surprising finding, grave no. 3, in which a woman 159 centimetres in height was found lying on her back with her legs facing south and her hands folded on her lap. The fragments of a rosary were found by her wrist. The head of the woman was separated from her body and was placed, with a stone in the mouth, between her knees. According to the author of this excavation (M. Ernée) this is evidence of so-called anti-vampire precautions. Reports based on written sources indicate that in Plešivec, in the region of Český Krumlov, in 1604 a Lutheran cemetery was founded, which went out of use sometime between 1624 and 1663. When a military cemetery was founded there, the site was consecrated again in 1779 (research by the museum in Český Krumlov).

Archaeological excavation was carried out on the remains of the second early modern burial ground in Český Krumlov in 2004. Between 1585 and the 19th century an area that now serves as a town park was used as the town cemetery at St. Martin's (sv. Martin). The excavation uncovered eighteen graves dating from the 19th and 20th centuries. In addition to skeletal remains the remnants of wooden coffins were also discovered, some of which were painted and decorated with paper, and other items such as nails, tinwork, and metal portrait lockets were also discovered (excavation by the museum in Český Krumlov).

In the historical centre of the town of Tábor archaeological excavation has thus far discovered burial grounds from two periods. The first burial site is connected with the Augustinian monastery on what is today Náměstí Mikuláše z Husi. In the 1980s three graves containing coffins with metal handles were discovered on the outer face (i. e. beneath the foundations of the adjacent elementary school) of the Church of the Virgin Mary (kostel Panny Marie) during reconstruction work. Inside the coffins, pieces of woven leather belts were found on the skeletal remains, and the figures held rosaries in their hands, and there was a metal crucifix

around the neck of one figure. This differed from the archaeological situation discovered south of the church in 1983-1984, where graves were discovered in the area of the elysian courtyard, where the figures had been buried according to the Christian rite, but no wooden coffins were discovered in an archaeological assessment of the graves and no items of a personal nature were discovered (excavation by the Hussite Museum in Tábor).

The second example, located in the historical centre of Tábor and the surrounding area, are individual graves which originated in connection with the siege on the town during the Thirty Years War. Two makeshift graves were discovered on the northeast side outside the town walls, near the path leading from what is now Tržní Square through the town gate to Tismenický Creek and Jordán. Except for skeletal remains the archaeological excavation on the burial pits did not uncover evidence of any material items, with the exception of the first grave examined, where the skeleton of person who had been fatally shot through the head lay on a wooden board. A comparison of illustrations and written and archaeological sources suggests that both makeshift graves were probably connected with the military capture of the town in 1621 (excavation by the Hussite Museum in Tábor).

The most recent discovery in Tábor connected with the same historical event are two graves in shallow makeshift burial pits, discovered in the immediate proximity of the inner foot of the southern town wall, not quite perfectly laid out in an east-west direction. They were unearthed in 2003 during archaeological excavation on the former castle grounds, inside the malt house dating from the early modern period (*fig. 3*). The burial pits reveal no remnants of coffins, and the only accessories that remained were metal clips. Both skeletons were examined using anthropological methods at the Faculty of Science of Masaryk University in Brno (*Krajíc – Mořkovský 2005*). The find circumstances indicate that both graves date from the period of the siege of Tábor in 1621. There is a possibility that other finds that were made in 1935 very close to the graves may be connected with these graves (*Krajíc – Mořkovský 2005*, 415). At that time what was evidently a mass grave was discovered near the town walls between Kotnovská tower and Bechyně gate, and in it the deceased were laid out unusually with their heads towards the south.

Fig. 3. Tábor – castle. Provisional grave near the town walls – siege of the town in 1621. Archaeological excavation by the Hussite Museum sin Tábor in 2003.
Obr. 3. Tábor – hrad. Provizorní hrob u hradební zdi – dobývání města v roce 1621. Archeologický výzkum Husitského muzea Tábor v roce 2003.

The Church of St. Philip and Jacob (kostel sv. Filipa a Jakuba) cemetery has stood just outside the walls of the medieval town of Tábor since the 14th century. In 1989 archaeological excavation was carried out in its nave and was able to reveal the historical-structural development of the church from the middle ages up to the present. Inside, the remains of graves disturbed by subsequent alterations were found (excavation by the Hussite Museum in Tábor).

In 2000, in Planá nad Lužnicí, several dozen early modern graves with the remnants of wooden coffins were discovered on V hlinách Street. Given that only skeletons were found in the burial pits and no other materials, and given that the site is located on the built-up area of the village, not far from the main road, it may be that this was a provisional burial ground that originated in connection with certain historical events in the second half of the 19th century (excavation by the Hussite Museum in Tábor).

There are several sites in Southern Bohemia documented in records that are connected with the execution of capital punishment in the early modern age and have been the target of archaeological research: one is a gibbet from the 15th-18th century near Blatná, a walled structure on a 7.5 x 5.9 metres ground plan, with surviving ruins up to 70 cm; another is a gibbet in Strakonice from the same period; a third is a gibbet near Vodňany, which is also known from illustrations from 1710

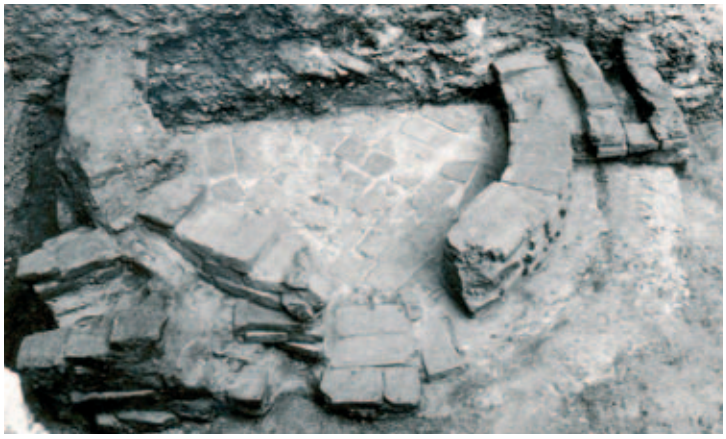

Fig. 4. Tábor – Mikuláš z Husi Square no. 44. A set of pottery kilns from the 15th-17th centuries. The picture shows the circular clay foundation of the older kiln beneath the brick floor of the younger kiln. The structures were disrupted by the construction of the Augustinian monastery in 1642–1666. Archaeological excavation by the Hussite museum in Tábor from 1983.
Obr. 4. Tábor – náměstí Mikuláše z Husi čp. 44. Baterie hrnčířských pecí z 15. – 17. století. Na snímku je patrná hliněná kruhová základna starší pece pod cihlovou podlahou nejmladší pece. Tělesa byla porušena výstavbou augustiniánského kláštera z let 1642 – 1666. Archeologický výzkum Husitského muzea Tábor z roku 1983.

and 1764. In 1995 archaeological rescue excavation was carried out here and the site was fully surveyed (excavation by the museum in Blatná and the museum in Strakonice; for information see *Michálek 2006, in print*).

III.3 Production

III.3.1 Pottery (*figs. 4-11*)[3)]

Descriptions and selected examples of archaeological finds in the Czech Republic:

In addition to recording and documenting ceramics finds from the early modern age, archaeologists have also long been interested in studying pottery-producing regions that have identifiably specific structural and technological features and a specific design. An example of such centres of pottery production in Bohemia is the town of Beroun and products known as "Beroun ware" (*Matoušek – Scheufler 1983*; *Matoušek – Scheufler – Štajnochr 1985*) and Habán production in Moravia, from archaeological findings in Strachotín and Strážnice (*Pajer 1982*; *1983*; *1990*). In addition to everyday household kitchen and tableware, in recent years attention has been devoted to archaeological majolica and mezzo-majolica finds (*Matoušek – Scheufler – Štajnochr 1985*; *Štajnochr 1998*; *Štajnochr – Fröhlich – Krajíc – Militký 1998*). A positive development is that archaeologists of the medieval and post-medieval periods have also shown an interest in establishing a common chronological dividing line between the two sub-disciplines and thus also an interest in observing the structural and technological changes in household pottery from the medieval and early modern periods. Although to date just local and regional finds have received attention (e. g. Chrudim, Pilsen, Prague, Tábor), there will be the possibility of expanding this in the future through comparisons and possibly even by means of generalisations relating to the main transformational features in pottery production in the waning middle ages and emerging early modern age.

Fig. 5. Tábor – house no. 13. Late medieval household pottery from the sump filled with household furnishings after a fire in 1532. Archaeological excavation by the Hussite Museum in Tábor in 2004.
Obr. 5. Tábor – čp. 13. Pozdně středověká užitková keramika z cisterny, zasypané domovním mobiliářem po požáru v roce 1532. Archeologický výzkum Husitského muzea Tábor v roce 2004.

Of the many Bohemian, Moravian, and Silesian localities where early modern pottery has been found, some examples include the collections from Brno and the Brno region that have been published (*Himmelová – Procházka 1990*; *Loskotová 1997*; *Novotný 1959*; *Od gotiky 1999-II*, 539 n.), Ivančic (*Šebela – Vaněk 1985*), Moravský Krumlov (*Malík – Peška 1994*), Nymburk (*Renesanční sklo b. d.*), Olomouc and the Olomouce region (*Bláha 1983*; *Renesanční Olomouc 1998*; *Od gotiky 1999-III*, 585 n.), and Opava and the Opava region (*Od gotiky 1999-IV*, 207 n.) and Prague (*Frolík – Smetánka 1997*; *Huml 1971*; *1995*; *Charvátová – Charvát 1981*; *Richterová 1997*; *Vařeka 2002*; *Žegklitz 1982*; *2001*; *Žegklitz – Zavřel 1990*; *Příběh Pražského hradu 2003* etc.).

Early modern pottery production has been the subject of attention in archaeology for a long time. Research focuses on analysing products (archaeological finds), the field ruins of productions buildings (especially burning kilns), and the appearance and equipment of pottery workshops (*Žegklitz 1985*; *1990*; *1990a*).

Note 3:
Early modern ceramics accompany all the research cited in other parts of the study as basic evaluative and dating material, and for this reason the relevant localities are not cited in the discussion of pottery.

Southern Bohemia:

A pottery workshop that operated from the end of the middle ages up to the 17th century was discovered in the garth of the former Augustinian monastery in Tábor (today Mikuláše z Husi Square no. 44 – *fig. 4*) and was the target of archaeological excavation in the first half of the 1980s. In the site, a metre-thick layer of pottery waste from the large production complex had been preserved, along with a set of six burning kilns, which offered an opportunity to follow the development of the construction of this kind of technology, from the earliest simple domed single-chamber kilns made of loam, to kilns from the start of the 17th century built of brick. In the youngest model, a part of the batch has been preserved – simple pots glazed on the inside. One of the chronological stages of the workshop's existence may be connected with the particular potter family that lived and worked in the space in the 16th century (excavation by the Hussite Museum in Tábor).

Just as the scope of this study only permitted space for some selected examples of locations with finds of early modern pottery in the Czech Republic to be listed here, the same applies to the region of Southern Bohemia. In this region early modern finds are made on almost every archaeological survey focusing on medieval or earlier historical sites or settlement complexes, such as the historical centres of towns and villages, etc., and thus I only present examples that yielded larger, cohesive collections of early modern pottery from sites where the functions and operations could be determined and that are therefore best suited for further study.

There are collections of kitchen and tableware pottery from the end of the middle ages and the early modern age from Soběslav (*Krajíc 1990*) and house nos. 6 and 7 in Tábor (excavation by the Hussite Museum in Tábor) and house no. 220 (*Krajíc 1998*). The last of these produced an overview of household pottery from the end of the 15th to the beginning of the 17th century and, thanks to its good stratigraphic situation, it was also possible for the first time in the Tábor region to examine the differences in local late medieval and early modern pottery production, including the transition period between the two, and to observe the change in the structure and the technology of pottery over the course of the first third or first half of the 16th century. Other findings on late medieval and early modern kitchen and table ceramics were yielded in archaeological excavation on the castle in Tábor in 1993–1994 and 2003, especially in the silted castle ditch and in the levelling connected with a fire in the town and the castle in 1532 (excavation by the Hussite Museum in Tábor). An idea about the variety of ceramic work used in townspeople's households at the end of the 15th and start of the 16th century was provided by the dozens of unbroken pieces obtained during archaeological excavation in house no. 13 on Žižka Square in Tábor (*Krajíc 2006a*; *fig. 5-7*). An equally rich collection was yielded from excavation on a sump at Svatošova Street no. 308, dated from around the year 1600 (*Krajíc – Chvojka 2006*; *figs. 8-9*). Chronologically the youngest site with early modern household ceramics found in Tábor is the sump in house no. 54, which contained dozens of unbroken items from the 17th and 18th centuries, and some of the youngest items may even be from the beginning of the 19th century (excavation by the Hussite Museum in Tábor; *figs. 10-11*). It follows from this summary of pottery production in Tábor in the post-medieval period that, in the relatively near future, there is a genuine possibility of developing an overview of the structural variability of local household ceramics in a continuous sequence from the 15th to the start of the 19th century.

Fig. 6. Tábor – house no. 13. Ceramic lamp, a true functional imitation of metal lamps from the period before 1532. Archaeological excavation by the Hussite Museum in Tábor in 2004.
Obr. 6. Tábor – čp. 13. Keramická lucerna, věrná funkční a tvarová napodobenina plechových luceren z období před rokem 1532. Archeologický výzkum Husitského muzea Tábor v roce 2004.

Fig. 7. Tábor – house no. 13. An ornately decorated lid with cuts in the perimeter, with glaze on the outside, and a pair of clowns stuck together, taken from locally produced tile patterns; dates from before 1532. Archaeological excavation by the Hussite Museum in Tábor in 2004.
Obr. 7. Tábor – čp. 13. Bohatě zdobená poklice s obvodovým prořezáváním, polevou na vnější straně a dvojicí k sobě přilepených šašků, převzatých z kachlových předloh místní výroby; před rokem 1532. Archeologický výzkum Husitského muzea Tábor v roce 2004.

Fig. 8. Tábor – house no. 308. Household pottery from the sump filled in around the year 1600. Archaeological excavation by the Hussite Museum in Tábor in 2001.
Obr. 8. Tábor – čp. 308. Užitková keramika z odpadní jímky, zasypávané v období kolem roku 1600. Archeologický výzkum Husitského muzea Tábor v roce 2001.

Fig. 9. Tábor – house no. 308. Household ceramics from the sump, filled in around the year 1600. Archaeological excavation by the Hussite Museum in Tábor in 2004.
Obr. 9. Tábor – čp. 308. Užitková keramika z odpadní jímky, zasypávané v období kolem roku 1600. Archeologický výzkum Husitského muzea Tábor v roce 2004.

Fig. 10. Tábor – house no. 54. Household ceramics from the sump, filled in during the 17th and 18th centuries. Archaeological excavation by the Hussite Museum in Tábor in 1996.
Obr. 10. Tábor – čp. 54. Užitková keramika z odpadní jímky, zasypávané v průběhu 17. a 18. století. Archeologický výzkum Husitského muzea Tábor v roce 1996.

Fig. 11. Tábor – house no. 54. Household ceramics from the sump, filled in during the 17th and 18th centuries. Archaeological excavation by the Hussite Museum in Tábor in 1996.
Obr. 11. Tábor – čp. 54. Užitková keramika z odpadní jímky, zasypávané v průběhu 17. a 18. století. Archeologický výzkum Husitského muzea Tábor v roce 1996.

Another extensive collection of materials from Southern Bohemia is the 17th-18th century pottery discovered in a well in the courtyard at Latrán no. 55 in Český Krumlov (*Beneš 1999*) and the chronologically younger finds from Písek (*Dohnal – Fröhlich 2000*; *Fröhlich – Scheufler 1988*; *1988a*).

An example of a building connected with early modern pottery production in Southern Bohemia is the pottery sump dating from the end of the 19th century, discovered on Čechova Street in Písek (*Fröhlich 2001*).

III.3.2 Stove-building (*figs. 12-15*)

A general description and selected examples of archaeological finds in the Czech Republic:

The study of early modern heating elements, i. e. tile stoves, and in particular their basic structural features, i. e. tiles, are at the forefront of the interest of archaeologists specialising in medieval and post-medieval material culture. In the past ten to fifteen years this interest has focused on evaluating individual finds and larger regional collections and on addressing questions relating

to the technological processing of raw materials and the production of the moulds and the tiles themselves and the description and visual analysis of decorative motifs (*Anderle 1996*; *Brych 2001*; *2004*; *Brych – Stehlíková – Žegklitz 1990*; *Břicháček – Hereit 1996*; *Durdík – Hazlbauer 1991*; *Ernée – Vitanovský 2003*; *Hazlbauer 1988*; *1990*; *1995*; *1997*; *1998*; *2000*; *Hazlbauer – Pavlík 1996*; *Hazlbauer – Špaček 1986*; *Hazlbauer – Waldhauser 1998*; *Jordánková – Loskotová 2002*; *Korený – Kypta – Šulc 2003*; *Krajíc – Volf 1997*; *Menoušková 2003*; *Miloš – Michna – Sedláčková 1998*; *Motyková – Hazlbauer 1999*; *Pavlík – Vitanovský 2004*; *Renesanční Olomouc 1998*; *Tetour 2005*; *Ulrychová – Hazlbauer 1998*; *Žegklitz – Zavřel 2004*; *Žegklitz 2006*). Thanks to this complex approach research on early modern cooking and heating devices is similar in depth and breadth to the study of tiles and tile stoves from the medieval period.

Southern Bohemia:

As was implied above, research on medieval and research on early modern cooking and heating devices have much in common. As a result, in scholarly literature on Gothic or "Gothic-Renaissance" tiles, references are made to products and tile-stove structures that date from an even later period. This is the case, for example, of the excavation in house no. 28 in Tábor (*Krajíc 1997*), which was devoted primarily to Gothic stoves, and the research on decorative motifs on Gothic tiles in the Tábor region (*Krajíc 2005*).

Archaeological research in recent decades has yielded single tiles and large collections that have provided information about the decorations and original appearance of heating and cooking devices from the 16th to 18th centuries (*Krajíc 2002*, 294; *fig. 12*). Among these are the finds dating from the 16th century in house no. 220 in Tábor (*Krajíc 1998*), some green-glazed tiles, depicting three male figures in arcade windows with three lunettes (*fig. 13*) and depicting the Grammar from the Seven Liberal Arts found in house no. 137 (excavation by the Hussite Museum in Tábor; *fig. 14*), a collection of tiles from various heating and cooking devices from the 17th-18th century located in house no. 54 (excavation by the Hussite Museum in Tábor), and a representative collection

Fig. 12. Tábor – house no. 308. Late Gothic corner tiles with a decorative combination – a relief with a shield-bearing angel in an alcove, cuts across the front faces; before 1525. Archaeological excavation by the Hussite Museum in Tábor in 2001.
Obr. 12. Tábor – čp. 308. Pozdně gotický rohový kachel s kombinovanou výzdobou – reliéf s andělem štítonošem ve výklenku, celoplošné prořezání předních stěn; před rokem 1525. Archeologický výzkum Husitského muzea Tábor v roce 2001.

Fig. 13. Tábor – house no. 137. Renaissance tile with three male figures in bay windows with lunettes. From the collection of the Hussite Museum in Tábor.
Obr. 13. Tábor – čp. 137. Renesanční kachel se třemi mužskými postavami v arkádových oknech s lunetami. Sbírka Husitského muzea Tábor.

Fig. 14. Tábor – house no. 137. Renaissance tile depicting the Grammar. From the collection of the Hussite Museum in Tábor.
Obr. 14. Tábor – čp. 137. Renesanční kachel se zobrazením Gramatiky. Sbírka Husitského muzea Tábor.

Fig. 15. Soběslav – castle. Grey chamber tile with a Renaissance portrait motif in a medallion. From the collection of the Hussite Museum in Tábor.
Obr. 15. Soběslav – hrad. Režný komorový kachel s renesančním portrétním motivem v medailonu. Sbírka Husitského muzea Tábor.

of tiles from the 16th and 17th centuries from Soběslav (excavation by the Hussite Museum in Tábor; *fig. 15*).

Among the most important finds in Southern Bohemia in the last decade is a collection of Renaissance tiles taken from the castle in Český Krumlov. Coloured glazed Renaissance tiles were discovered during archaeological excavation on the second courtyard in 1995. A mass find in 1918 also yielded numerous tiles. The decorative elements include leaf moulds, egg-shaped decorations, plant and allegorical motifs, figural motifs, like the head of a bearded man with a cap within a circular medallion, the image of God in an oval medallion, or a tall relief of a lion's head. The colours of the glazes are green, white, yellow, various shades of blue, jade, brown, black, and exceptionally also pink, grey, and gold. A discovery in 1918 yielded 368 pieces of Renaissance tiles, 130 of which were colourfully glazed. A limekiln examined in 1995 yielded 3070 tile pieces, of which 398 are colourfully glazed. The ash from the limekiln is dated around 1696–1720 (*Ernée 2002*; *2004*).

Fig. 16. Tábor – house no. 308. Glass goblets from the sump, filled in around 1600. Archaeological excavation by the Hussite Museum in Tábor in 2001.
Obr. 16. Tábor – čp. 308. Skleněné poháry z odpadní jímky, zasypávané v období kolem roku 1600. Archeologický výzkum Husitského muzea Tábor v roce 2001.

III.3.3 Brickmaking

A general description and examples of archaeological finds in the Czech Republic and Southern Bohemia:

The craft of brickmaking, brick products, and the technological equipment used in brickmaking in the medieval and early modern periods in the Czech Republic and within Europe are the subject of a monograph on brickworks from Sezimovo Ústí (*Krajíc 2006*). Consequently, there is room here only to refer to some more recent discoveries of early modern brick production facilities. One, for example, is a brickworks from the 19th–20th century, located on Trýblova Street in Brno (*Holub – Merta – Zůbek 2005*), and another is the discovery in 2006 of a pair of burning kilns in Lovosice (excavation by the Institute of Archaeological Heritage Conservation in Most).

III.3.4 Glass-making (*figs. 16-17*)

Fig. 17. České Budějovice – part of a painted glass beaker in the shape of a shoe. From the collection of the Museum of Southern Bohemia in České Budějovice.
Obr. 17. České Budějovice – část malované skleněné číše v podobě boty. Sbírka Jihočeského muzea v Českých Budějovicích.

A general description and examples of archaeological finds in the Czech Republic:

In the Czech Republic art history collections long had priority in analysing and exhibiting early modern glass (*Brožková 1983-1984*; *Drahotová 1982*; *1989*; *Drahotová – Hejdová 1989*; *Hetteš 1958*; *1958a*; *Jiřík 1934*; *Lněničková 1996*; *Mareš 1893*; *Panenková 1994*; *Poche et al. 1970*; *Vávra 1953*). The expansion of the field of interest to include archaeological finds has been witnessed since the 1990s. It is the result, in part, from the need among archaeologists and applied scientists studying historical glasswork to take an interest in archaeological finds of this type of material culture, and in part from the fact that the increase in the amount of archaeological fieldwork conducted during the last decade of the 20th century unearthed many individual finds and collections of glass from the early modern period. In the Glass Division of the Czech Archaeological Society a group was formed that focuses on archaeological finds from the Renaissance period, and consequently not only has it been possible to create a complete overview of the variety of forms of glasswork from the 16th and 17th centuries in the Czech Republic, but also for the first time the state of knowledge about early modern glass from archaeological finds has become an integral part of a comprehensive

analysis of the historical development of glasswork and glassmaking technology in the Czech lands (*Krajíc – Podliska – Sedláčková – Veselá 2005*). In addition to the emergence of studies focusing on individual finds and regional collections (*Drobný – Sedláčková 1997*; *Frýda 2000*; *Himmelová – Procházka 1990*; *Huml 1995*; *Teryngerová 1997*; *Od gotiky 1999-II*, 582-583; *Renesanční Olomouc 1998*; *Od gotiky 1999-III*, 585n; *Od gotiky 1999-IV*, 225; *Podliska 2003*; *Sedláčková 1997*; *2003*; *Veselá 2003*), advances have been made in research on the field remains of defunct early modern glassworks (Broumy, Božejov).

Southern Bohemia:

In archaeological research the study of early modern glasswork in Southern Bohemia has proceeded in two directions. First, there are the field surveys that have been conducted on glassworks in the Šumava and the Nové Hrady mountains, a form of research with a long tradition and the results of which have been published regularly (*Fröhlich 1989*; *1994*; *1994a*; *1996*; *2003*). The work of Jiří Fröhlich has resulted in the documentation and identification of the locations of more than one hundred glassworks, dating from between the 14th and 20th centuries in the border regions of the southern and southwest parts of Bohemia, and the discovery of glass ovens, production halls, waste heaps, the drives for the grinding plants, and roads and original residential structures. In many locations, sampling has been performed on products, molten glass, waste, and work tools, such as pans and moulds. In cooperation with the Museum of Western Bohemia in Pilsen, archaeological excavation was conducted on a glass oven from the 18th century in Stará huť near Vogelsang, not far from the border.

Fig. 18. Tábor – castle. Bell-casting pit. From before 1532. Archaeological excavation by the Hussite Museum in Tábor in 2003.
Obr. 18. Tábor – hrad. Jáma na odlévání zvonů, před rokem 1532. Archeologický výzkum Husitského muzea Tábor v roce 2003.

The second research trend in recent years has been the complex documenting and recording of archaeological finds of Renaissance glassware from Southern Bohemia (*Krajíc 2006b*). Alongside finds from the 16th and 17th centuries (České Budějovice, Český Krumlov, Landštejn, Písek, Tábor and many other sites – *figs. 16-17*), analysis has also been made of individual finds (*Krajíc 2006d*) and large collections dating from the 17th and 18th centuries (e. g. a collection from a sump in house no. 54 in Tábor – excavation by the Hussite Museum in Tábor).

III.3.5 The production and processing of metals (*figs. 18-19*)

A general description and examples in the Czech Republic:

The history of metalworking, types of defunct production buildings, and surface collections are analysed in systematic historical-archaeological and technological research, which has especially progressed in Moravia, and it is the subject regularly dealt with in the pages of *Archeologia technica*. Recently, information was made available to the public on the results of a survey of the Hlubocký tilt hammer on the outskirts of Brno and a defunct tilt hammer (Šlakhamr)

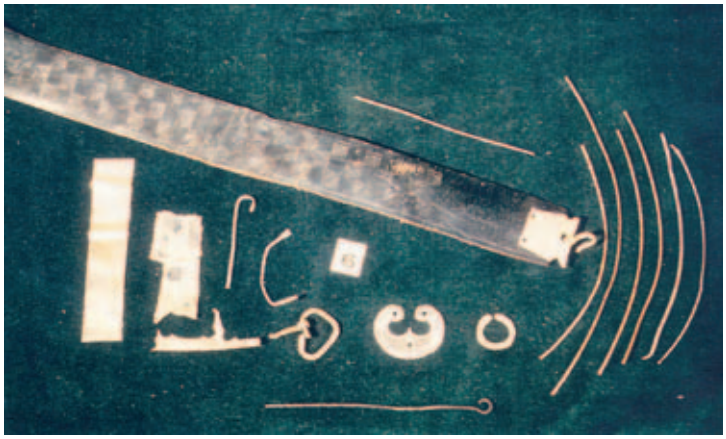

Fig. 19. Tábor – house no. 220. House belonging to Prokop the belt-maker. Completed and semi-finished products, and waste from production. From before 1527. Archaeological excavation by the Hussite Museum in Tábor in 1993-1994.
Obr. 19. Tábor – čp. 220. Dům pasíře Prokopa. Hotové výrobky, polotovary a odpady z pasířské výroby, před rokem 1527. Archeologický výzkum Husitského muzea Tábor v letech 1993-1994.

in the former district of Ždár nad Sázavou. Mining and the processing of precious metals in the medieval and early modern periods were the subject of a special edition of *Mediaevalia archaeologica* (*Těžba 2004*).

Southern Bohemia:

In Southern Bohemia there is a long tradition of research on the history of the process of obtaining and processing metals, primarily thanks to the work of Jaroslav Kudrnáč, who – as the founder of Czech mountain archaeology – for many decades devoted his attention to research on evidence of mining and panning for gold and other metals in the Otava River basin, in the Strakonice region, in the Písek region, and elsewhere (*Kudrnáč 1989*; *1993*). Silver mining in the early modern period in the region of Vožicko and in the Ratiboř mountains in the Tábor region is systematically studied by employees of Chýnov Caves, who document and survey underground works and surface remains, such as pit dumps, entrances to shafts, etc. Traces of early modern prospecting, such as pits, were discovered after surface probes were conducted in 2001-2002 in the northern part of the Tábor region, where there is evidence early modern silver mining. New sites discovered during archaeological surveying on the route of the future D3 motorway between Mezná a Chotoviny, were geodetically documented and archaeogeophysical measurements were made of them (excavation by the Hussite Museum in Tábor).

The post-medieval period is the subject of studies on medieval blacksmith work in Sezimova Ústí, which includes an overview of material and illustrative evidence relating to smith shops, their equipment, and products from between the 13th and 17th centuries (*Krajíc 2003b*).

Other production artefacts relating to metalworking include what was probably a metallurgy kiln, discovered in 1999 during excavation at Latrán no. 15 in Český Krumlov (excavation by the museum in Český Krumlov). This was a circular brick structure with a grating, a heating flue and a pre-firing pit, dug out in the solid ground. The structure was identified as dating from the mid-16th or first half of the 17th century.

The remains of a metallurgist's workshop, and even the pans for processing silver, were archaeologically analysed in Rudolfov (*Fröhlich – Klabouch 2000*). The most important archaeological find of this kind is the metallurgical oven discovered during archaeological excavation in house no. 27 on Radniční Street in Český Krumlov (*Ernée 2001*). In 1993–1994 fragments of technical ceramics, mostly melting pots, were discovered in this house, and parts of a portable ceramic metallurgical oven were found in the silt in its cellar. An analysis of written and archaeological sources indicate that this was part of the equipment of the workshop of the silver refiner and metallurgist Sebald Matighofer of Rožmberk, who pursued his trade in house no. 27 between 1540 and 1569.

A unique facility used for processing metals was discovered in 2003 during archaeological excavation on the former castle in Tábor, inside the early modern malt house (*fig. 18*). At the end of the 15th or the beginning of the 16th century there was a circular excavated pit with a flat bottom inside the casing of the cylindrical castle tower, and from the centre of the pit small channels fanned out in different directions. The structure and the area surrounding it were filled with corroded

green metals, slag, clay blocks and loam, which in some cases bore the inverse prints of geometric decorations and letters. The find circumstances and technological analogies indicate that this was a pit used to cast bells (excavation by the Hussite Museum in Tábor).

Metalworking also encompasses the beltmaking trade, and products, semi-finished products, and production waste from this process were discovered during archaeological excavation in house no. 220 in Tábor, which was owned until 1527 by a beltmaker by the name of Prokop (*Krajíc 1998*; *fig. 19*).

Fig. 20. Tábor – house no. 308. House belonging to the town chronicler Václav Churáněk. Finds connected with writing – a wooden book cover or paper file, partly inscribed parchment, wooden seal covers and leather glass frames, circa 1600. Archaeological excavation by the Hussite Museum in Tábor in 2001.
Obr. 20. Tábor – čp. 308. Dům městského písaře Václava Churáňka. Nálezy související s písařstvím – dřevěná deska z knihy nebo ze spisové složky, část popsaného pergamenu, dřevěné schránky pečetí a kožené obroučky brýlí, kolem roku 1600. Archeologický výzkum Husitského muzea Tábor v roce 2001.

III.3.6 Other trades and production sites (*figs. 20-21*)

Other production sites from the post-medieval period that did not fit into any of the preceding chapters can be divided into several groups. Research and surveys of windmills are connected with the food industry. In 1997 archaeological, geophysical, archive, and historical-structural research was carried out in Příčovy on a Dutch-style windmill from the mid-18th century (*Beránek – Dohnal – Korený – Křivánek – Vařeka 1998*). Similar work was carried out on a windmill in Bratronice in the Strakonice region dating from the 17th-20th centuries (excavation by the museum in Strakonice).

Brewing pans provide evidence of the early modern brewing industry. The remains of one were discovered in 1998-1999 during archaeological excavation of house no. 2 on Svornosti Square in Český Krumlov. This was a rectangular brick structure with its clamps intact. Although the site could not be dated by archaeological means, written records indicate the existence of a brewing trade in the building from the end of the 16th to the 19th century (excavation by the museum in Český Krumlov). A similar structure was discovered in 2000 in Český Krumlov in house no. 29 on Radniční Street, where evidence of brewing activity dates from before 1572, a brewing pan and other equipment are documented from 1626, and the demise of the trade is indicated as 1742. The last-cited date is also confirmed by an archaeological find (excavation by the museum in Český Krumlov). Early modern breweries studied recently include, for example, the structures in the former Carthusian monastery and estate in Královo Pole in Brno (*Holub – Merta – Sadílek 2004*). Economic and production structures documented include the fruit-drying house discovered on the edge of the village of Mračov in the Strakonice region. This was a stone structure, dating from roughly between the 18th and 20th centuries (excavation by the museum in Strakonice).

Trades engaged in the preparation and processing of materials for construction or other use in trades and households form a large group of early modern trades with an older historical tradition. These include tarring, coal firing, limekilns, potash production, and others. Information on these trades is regularly presented in *Archeologia technica*.

Just out of interest, two other professions detected using archaeological methods worth can be mentioned: the town chronicler, Václav Churáněk, who owned house no. 303 in Tábor from 1586 (*Krajíc – Chvojka 2006*; *fig. 20*), and the Vaverka family of shopkeepers (*Krajíc 2006a*; *fig. 21*).

Fig. 21. Tábor – house no. 13. House belonging to the Vaverka family of shopkeepers. Copper weight dish, from before 1532. Archaeological excavation by the Hussite Museum in Tábor in 2004.
Obr. 21. Tábor – čp. 13. Dům obchodníků Vaverkových. Měděná mísa z kupeckých vah, před rokem 1532. Archeologický výzkum Husitského muzea Tábor v roce 2004.

Fig. 22. Tábor – house no. 13. Cistern with remains of a wooden structure in the upper half filled in with refuse after a fire in 1532. Archaeological excavation by the Hussite Museum in Tábor in 2004.
Obr. 22. Tábor – čp. 13. Cisterna se zbytky dřevěné konstrukce v horní polovině; zasypána jednorázově domovním odpadem po požáru v roce 1532. Archeologický výzkum Husitského muzea Tábor v roce 2004.

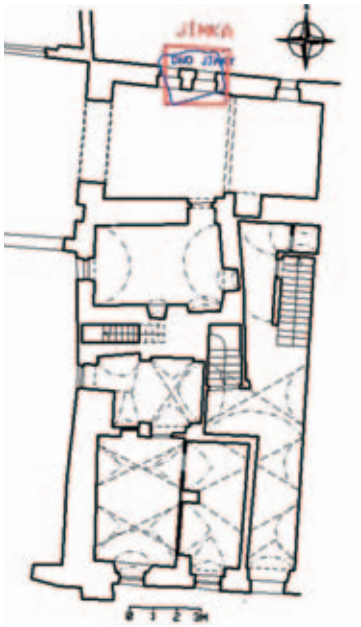

Fig. 23. Tábor – house no. 308. Ground-floor layout of a building, including a sketch of the sump, filled with material around 1600. The front half of the structure of the tank protrudes into the building, the rear half extends through the outside wall of the building. Archaeological excavation by the Hussite Museum in Tábor in 2001.
Obr. 23. Tábor – čp. 308. Půdorys přízemí domu se zakreslením odpadní jímky, zanesené materiálem z období kolem roku 1600. Těleso jímky zasahuje přední polovinou dovnitř domu, zadní přesahuje vně, tj. mimo severní obvodovou stěnu domu. Archeologický výzkum Husitského muzea Tábor v roce 2001.

III.4 Utilities (*figs. 22-23*)

A general description and examples in Southern Bohemia:

The wide topic of utilities on the territory of the Czech Republic are part of the more general study of this history of settlement (in connection with individual buildings, localities, and regions), or individual topics (dumps, wells, technical facilities, etc.) are the subject of separate attention. Given the breadth of this subject, only selected examples in Southern Bohemia are presented below.

An important utility in every community and household was drinking water. The most common early modern structures connected with supplying and distributing water are wells, fountains, water channels, etc. The supply of water was a part of communal policy as well as one relating to individual household structures. The category of public structures would include, for example, Samson fountain in České Budějovice dating from 1721-1727, which was part of the town water supply system. During its reconstruction in 1999, archaeological rescue excavation was carried out on Přemysl Otakar II Square (excavation by the Museum of Southern Bohemia in České Budějovice).

Part of the public water supply system in Jindřichův Hradec, which according to written records was built after 1680, was archaeologically excavated in 1992. A stone drain on Mír Square connected with a wooden water pipe in the direction of the castle (Dobrovský Square – excavation by the museum in Jindřichův Hradec). Long-term research has focused on the remains of medieval and early modern water supply facilities in Prachatice (*Beneš 1996a*).

In Tábor the problem of securing a water supply was solved in 1492 when Tismenický Creek was dammed and an artificial water reservoir called "Jordán" was built. Water was drawn from the reservoir along through a complicated technical mechanism and pumped into a water tower (mention of which appeared in written records as early as 1508) by the town walls, and from there it was distributed to seven town fountains. The best known of these was on Žižka Square, and its current appearance dates from 1567. The water pipes through which water was distributed through the town were wooden, connected with iron rings, which were discovered at several locations, most recently at the end of the 1990s on Kotnovská Street (excavation by the Hussite Museum in Tábor). Around the turn of the 16th century the problem of supplying water to the town had been solved, and thus in some cases the cisterns that – like the wells for ground water – had in the 13th-15th centuries been the only source of water within the town ceased to be used. From the turn of the 16th century the majority of household cisterns were used for waste. The most recent archaeological excavation on this type of site was on the cistern in house no. 13 on Žižka Square, which was filled with layers of burnt refuse when the building was cleaned after a fire in 1532 (*Krajíc 2006a*; *fig. 22*).

Some similar utility structures in the town buildings were, from the start of construction, conceived as part of the building's sanitation facilities, i. e. toilets and sumps. Several different types of shaft-like structures were archaeologically examined in the past decade in the historical centre of Tábor.

They were usually situated in the rear section of the building, were square or slightly rectangular in shape, and reached a depth of around 6 metres. It was not unusual for the capacity to be increased with a trench several metres long and up to 2 metres in height, excavated level to the bottom along one side of the walls of the cistern. Most sumps were located in the interior of the building, usually added to the rear outer wall, or they were found in one of the rear corners of the building. In one case the sump was situated in such a way that the front half protruded inside the building and the rear half was outside (*fig. 23*). The sump was accessible from both the ground floor inside the building and from the first story off the cantilevered bay, with an encased connection between the first floor and the mouth of the shaft at the ground-floor level. Material from the early modern period filled the sumps in house no. 220 (*Krajíc 1998*), house no. 308 (*Krajíc – Chvojka 2006*), house nos. 6, 7, 54, and others.

Public dumps and the collection of household waste are documented in Tábor at two locations: one in the castle ditch and the other outside the town walls at Žižka's stronghold, where refuse and waste was dumped after the town fire in 1532. Other archaeological excavation of this nature includes the site of Svět pond, where scrap material was taken to reinforce the dam opposite Novohradská Gate in the 15th-18th centuries (excavation by the museum in Jindřichův Hradec).

The former utility building and remains of the early modern sewer system made of brick and stone drains were discovered in 2003 during archaeological excavation on the northeast part of the Cistercian monastery in Vyšší Brod (excavation by the museum in Český Krumlov).

In recent years archaeobotanical research on medieval and early modern waterworks has also made substantial progress. Work published thus far includes finds from Prachatice, Vimperk, Cuknštejn, Chanovice, and Gutštejn (*Beneš 1996a*; *Beneš – Kaštovský – Majer 1998*; *Beneš – Kaštovský – Kubečková 2001*).

Fig. 24. The „Golden Path" – Zhůrský system. Among the most common finds n the sections of the path studied are medieval and early modern iron objects (chains, horseshoes, wheel and wagon fittings, etc.). Excavation by the Museum of Southern Bohemia in České Budějovice and the museum in Prachatice.
Obr. 24. Zlatá stezka – Zhůrský systém. K nejčastějším nálezům na zkoumaných úsecích patří středověké a novověké železné předměty (řetězy, podkovy, kování kol a vozů ad.). Výzkum Jihočeského muzea v Českých Budějovicích a muzea v Prachaticích.

III.5 Transport, trade, exchange (*figs. 24-26*)

Southern Bohemia:

The development of the economy, and local and long-distance trade, was accompanied by the construction of roads and trade routes. One of the sites best researched and documented from an archaeological-historical perspective is the "Golden Path" in Southern Bohemia. In addition to the field surveys and detailed measurements that have been carried out on its course and nearby monuments, representative material from the medieval and early modern periods were obtained from one of its many sections (summarised in *Kubů – Zavřel 2001*; *fig. 24*).

Archaeological research on trade, exchange, and shopkeeping has produced new information in recent years. In addition to various minor items, coins, weights, and the pans from shopping scales, some of the most important finds have been historical coin deposits (*Krajíc – Chvojka 2006*; *Krajíc 2006a*; *fig. 21, 25, 26*).

Fig. 25. Tábor – house no. 308. Coin deposit, hidden beneath the floor of a room on the ground story, it contained 3959 silver coins in two ceramic dishes with a converted value of 2760 groschen; from before 1525. Archaeological excavation by the Hussite Museum in Tábor in 2001.
Obr. 25. Tábor – čp. 308. Mincovní depot, ukrytý pod podlahou přízemní místnosti, obsahoval ve dvou keramických nádobách 3959 stříbrných mincí v přepočtené hodnotě 46 kop grošů; před rokem 1525. Archeologický výzkum Husitského muzea Tábor v roce 2001.

Fig. 26. Tábor – a set of scale weights from the area in front of the castle, at the site of an early modern synagogue; from before 1532. Excavation by the Hussite Museum in Tábor in 2005.
Obr. 26. Tábor – sada lotových závaží z prostoru před hradem, v místě novověké židovské synagogy; před rokem 1532. Výzkum Husitského muzea Tábor v roce 2005.

III.6 Technical monuments

Southern Bohemia:

Examples of archaeological research on early modern technical monuments (*Technické 2002 – 2004*) in recent years include the discovery of "Urban's Bridge" in Jindřichův Hradec. During the construction of the main sewer the remains of the bridge were detected in Zbuzany. It was originally a medieval bridge that, in the 17th-18th centuries, was expanded and its supports were reinforced. It was destroyed in the town fire on 19 May 1801 (excavation by the museum in Jindřichův Hradec).

Archaeology has also applied its fieldwork and documentation methods to research on other technical monuments. These include sections of the route of the horse-drawn railway. Archaeological excavation has thus far been carried out at a location in České Budějovice where a Delvita store stands today (*Výzkumy 2000*, 32), at a station in Kaplice in 2002 (*Výzkumy 2003*, 266-267), and in 2003 the location of the former stables of the horse-changing station in Bujanov was surveyed (*Hajn – Chvojka – Majer 2004*).

III.7 The archaeology of landscape

A general description and examples in Southern Bohemia:

The documentation and interdisciplinary study of historical landscapes (*Gojda 2000*) is developing actively in Southern Bohemia. This is partly owing to the need to observe the transformation of the historical-cultural landscape in connection with the intensifying impact of society on nature (motorways, development projects, large-scale construction sites, etc.), and is partly owing to the opportunities arising out of cooperation between archaeology and the natural sciences, in Southern Bohemia especially with the field specialisation of the Laboratory of Archeobotanics and Paleoecology in the Department of Botanical Science at the Faculty of Science of the University of South Bohemia.

There are currently two streams of research applied. One is the targeted study of selected micro-regions, and the other is the study of areas that are directly at risk from large-scale disruption of the landscape. Examples of the first group are Kouty in the Český Krumlov region (*Ernée – Stejskal 2001*; *2002*) or the area around Vlachův Březí in the Prachatice region (*Beneš – Hrubý – Michálek – Parkman 1999*). An example of the second group is the section of the future D3 motorway, running along Mezno – Chotoviny – Tábor – Soběslav – Veselí nad Lužnicí – Bošilec, which since 2001 has been the target of complex interdisciplinary research. This research includes aerial surveys of the landscape and sites, field surveying and collecting, archaeogeophysical prospecting, pedological drilling, archaeological excavations on deserted localities, and the study of collected archaeobotanical samples from selected locations (excavation by the Hussite Museum in Tábor).

IV. The Study of archaeology of the Medieval and Post-medieval periods at the University of South Bohemia in České Budějovice

The study programme of archaeology at the University of South Bohemia in České Budějovice, which was launched in 2005 and since 2006 had been run by the Institute of Archaeology at the Faculty of Arts of the University of South Bohemia, aims to offer basic professional (bachelor level) education in the field, with a continuing programme at the master's level, with two specialisations. The first specialisation will be devoted to archaeology and material culture of the medieval and early modern periods; the second will focus on the study of the historical development and transformation of the cultural landscape. Both areas of research are based on the current internal needs of the field of archaeology, but there also exists an opportunity for close cooperation between the study of the history of material culture in the medieval and post-medieval periods and the traditional focus of the Institute of History at the University of South Bohemia (especially on research of the early modern period). The second area of interest contains the opportunity combine the experience from research at the Faculty of Biology at the University of South Bohemia and archaeological-historical knowledge on the development and transformation of the landscape to develop the kind of interdisciplinary cooperation currently practised through the Laboratory of Archeobotanics and Paleoecology, established in the Department of Botanical Science in 2002, which conducts environmental analyses for archaeological institutions in the Czech Republic and abroad.

V. Conclusion

The above summary of the state and development of the field of archaeological research on the post-medieval period indicates that Southern Bohemia contains a substantial number of structures, sites, and themes that warrant more attention in the near future. At the same time it is necessary to point out that, despite the considerable efforts on the part of archaeologists from professional institutions in Southern Bohemia, it is beyond their power to research, analyse, and evaluate the discovered and documented sites in the near future. In the framework of practical work, various programmes, or graduation work there is an opportunity to involve students of archaeology at the University of South Bohemia in České Budějovice in the study of the medieval and early modern periods in the region of Southern Bohemia and thus to contribute to the field of archaeology itself, to regional archaeological heritage conservation, and finally to the expansion of the study opportunities of the emerging generation of professionals in the field of archaeology.

Resumé:

Obdobně jako ostatní vědní disciplíny prošla i archeologie za více než sto let své existence kvalitativní proměnou. Od prvopočátků, zaměřených na objevování a shromažďování starožitností, přes uznání a rozvoj archeologie jako regulérního vědeckého oboru až po moderní vědu s četnými subdisciplínami a víceoborovou spoluprací. I přes pokusy, sledovatelné v archeologii jako vědním oboru již několik desítek let, není dosud období postmedievální systematicky zkoumáno, byť jsou metodika terénních prací i způsob studia dokladů dobové hmotné kultury velmi blízké např. zaměření historicky předchozího – tedy vrcholně a pozdně středověkého – období.

V roce 1982 byla jako součást pracovní skupiny pro středověkou archeologii zřízena v rámci Československé společnosti archeologické při ČSAV pracovní skupina pro postmedievální archeologii. V následujícím roce se konalo v Berouně setkání archeologů, kteří se v rámci svého odborného zájmu zabývali i zkoumáním památek a materií z novověkého období. Příspěvky, přednesené na berounském semináři, stejně jako osamostatnění skupiny pro postmedievální archeologii při ČSSA ČSAV v roce 1987, měly pozitivní dopad především v tom, že v roce 1990 vydal Archeologický ústav ČSAV v Praze sborník, speciálně věnovaný archeologii novověkého období (Studies 1990). Kromě příspěvků, pojednávajících o archeologicky zkoumaných novověkých lokalitách, artefaktech a mezioborové spolupráci, přinesl tento sborník i první přehled o dějinách bádání v rámci této vědní subdisciplíny u nás a pojednal o jejím obsahu, problémech a perspektivách na našem území (*Smetánka – Žegklitz 1990*, 7-21; studie navázala na: *Žegklitz – Smetánka 1989*, 728-738).

Podíváme-li se na uplynulé patnáctileté období od vydání prvního sborníku, věnovaného české postmedievální archeologii, je nutno uvést, že se v mnoha směrech archeologické studium novověkého období rozšířilo a prohloubilo, že ke kvalitě výpovědních schopností archeologických pramenů i dokumentace nemovitých objektů z postmedieválního období výrazně přispívá spolupráce s mnoha dalšími vědními obory, že jsou často i na novověkých památkách aplikovány nedestruktivní metody poznání, že se posunulo naše poznání některých druhů postmedievální hmotné kultury atd. I přes množství terénních výzkumů a publikačních výstupů se však zatím nedaří zajistit pravidelné kontakty archeologů, kteří se v rámci svého odborného zájmu zabývají i obdobím postmedieválním, či dalších zájemců na setkáních celostátního charakteru. Přes všechna shora uvedená pozitiva o rozvoji a prohlubování archeologických poznatků o postmedieválním období v posledních patnácti letech je proto nutno konstatovat, že systematického studia či kooperace specialistů na národní úrovni formou např. pravidelných konferencí či vydávání specializovaného celostátního periodika zatím dosaženo nebylo.

Předložená studie je výtahem z připravované monografie, která pojednává o dějinách bádání a vývoji postmedievální archeologie na našem území a vedle odkazů na stav zpracování jednotlivých zájmových okruhů na území České republiky podává podrobný přehled o archeologických nálezech a studované problematice na území jižních Čech.

I v jižních Čechách souvisí současný stav archeologického poznání postmedieválního období převážně s výkonem archeologické památkové péče těch odborných institucí, které ve smyslu zákona 20/87 Sb. o státní památkové péči v tomto regionu působí. Většina poznatků tedy vyplývá z prospekčních a záchranných archeologických aktivit, daných smluvními pracovními vztahy s objednateli prací. Pouze některá z témat (užitková keramika, sklářství ad.) jsou – a to především díky iniciativám jednotlivců – již od počátku cíleně zaměřena na novověkou problematiku.

V jižních Čechách lze rozdělit studovanou problematiku rámcově do pěti tematických bloků, přičemž se některé nich obsahově prolínají. První skupinu představují sídla, sídliště a stavební objekty (A), druhou pohřebiště (B), další prezentují hmotné doklady práce a výroby (C), čtvrtou skupinu zastupují prameny vypovídající o obchodu, směně a dopravě (D), a konečně poslední jsou doklady, obsahující informace o duchovním životě společnosti. Samostatně je studována problematika proměn historické krajiny (tab. 1, 2).

Vedle stávajících aktivit se v současné době nabízí možnost rozšířit studium novověkého období archeologickými metodami i na půdě Archeologického ústavu Filosofické fakulty Jihočeské univerzity v Českých Budějovicích. Studium archeologie na Jihočeské univerzitě si totiž klade za cíl se vedle základního profesního vzdělání v oboru orientovat na problematiku hmotné kultury středověkého a novověkého období a specificky se věnovat i studiu historického vývoje a proměn kulturní krajiny. Oba směry bádání vycházejí nejen ze současných vnitřních potřeb oboru archeologie, ale nabízí se zde i možnost úzkého propojení studia hmotné kultury medieválního a postmedieválního období s tradičním zaměřením Historického ústavu FF JU na historické bádání o raném novověku.

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Limits and possibilities of archive studies and its use in archaeology and building history. (Experiences from the study of manuscripts from the New Town office for the 15th to 17th centuries)

Meze a možnosti místopisného studia a jeho využití v archeologii a stavební historii. (Zkušenosti ze studia knih novoměstské kanceláře pro období 15.-17. století)

Grenzen und Möglichkeiten der Ortsbeschreibung und ihr Nutzen für die Archäologie und Baugeschichte.
(Die Erfahrungen aufgrund des Studiums der Bücher der Kanzlei der Prager Neustadt für den Zeitraum 15.-17. Jahrhundert)

Kateřina Samojská

Im Rahmen der laufenden archäologischen Grabung auf dem Náměstí Republiky-Platz in Prag wurde auch eine sorgfältige topographische Untersuchung von mehr als zwanzig Bürgerhäusern durchgeführt, die im 15. bis 19. Jahrhundert entlang der Grenze des ausgegrabenen Häuserblocks zwischen den Straßen Na Poříčí, Truhlářská- und dem Náměstí Republiky-Platz standen. Die Erfahrungen aus dem vieljährigen topographischen Studium dieser Häuser ermöglichen nun eine Bilanz der angewandten Methoden, der konkreten Ergebnisse sowie Überlegungen zu ihrem Beitrag für Nachbardisziplinen, wie Archäologie und Baugeschichte.
Der Aufsatz skizziert in den Hauptzügen die Möglichkeiten des interdisziplinären Studiums, d. h. welcher Typ von Informationen in welchem Kontext, konfrontiert mit konkreten Befunden, gewonnen werden kann. Andererseits werden auch die Grenzen angedeutet, d.h. Typen von Informationen und Feststellungen, zu denen wir nur ausnahmsweise gelangen können. Die hier präsentierten Erfahrungen können auch einen rein praktischen Nutzen haben, z.B. für die Planung archäologischer Ausgrabungen, bei der Entscheidung, ob das zeitlich aufwendige topographische Studium in das Grabungsprogramm eingereiht werden soll, und zeigen an, welche Ergebnisse für das Gebiet der Prager Neuen Stadt und für den besagten Zeitraum zu erwarten sind.

The ongoing archaeological excavations at Náměstí Republiky (Republic Square) included a detailed archive studies on more than twenty town houses which originally stood along the perimeter of the studied block of houses between Na Poříčí Street, Truhlářská Street and Náměstí Republiky for the period between the 15th and the 19th centuries. Experience gained from several years of an archive study of these houses now also allows us to assess the methods used, including their specific outcomes, and to consider the practical benefits of applied archive research for related disciplines. The experiences briefly presented here may prove useful for future researchers and their future research work, for instance in deciding whether to include time-consuming and financially demanding archive study into their research programme and what outcomes they can expect.

A chronological overview of a lot's owners and the trades practiced there; spatial localization of the house

As shown by the research at Náměstí Republiky, the systematic study of original municipal records can offer a very accurate overview of a house's owners, and thus – in most cases – also the trades and crafts practiced on a lot at a particular time. The history of owners and the number and order of houses along the streetfront is thus reliably recorded by historical topography – even for houses which have long been deserted and which no longer have above-ground remains (at Náměstí Republiky, almost one half of houses demolished in the 17th century in connection with the construction of the Capuchin monastery was excavated). Without the help of other disciplines, however, historical topography cannot reliably provide the precise spatial extent of a house, especially the width of a lot, i. e. its exact spatial localisation. Unless the house is a prominent stand-alone building whose construction and shape have remained unaltered to this day, the final word on its temporal and spatial localisation will have to be made by archaeology and building history, not topography. If it is indeed possible to document a similar prominent structure – a property with a stable spatial and familial history over many centuries – such a discovery is undoubtedly of great help for further archive research.

At the excavations on Náměstí Republiky, such an enduring and easily identifiable prominent structure was the large house known as "Skála" ("The Rock"), located at no. 1113 in Truhlářská Street, whose contemporary proportions are the same as they were in the second half of the 15th century. Using this house as a reference point, it was thus possible to start the reconstruction of the entire streetfront once we knew the number, order and names of the houses, even if we were unsure about their precise location. A similar role was played by the large malt houses on the opposite side of the block facing Na Poříčí Street, which were under the stable ownership of the same maltmaster families from the end of the 15th until the 17th century.

Undoubtedly of great benefit to research is a situation in which we have the greatest possible number of analysed houses immediately adjoining each other, better still an entire urban block or the complete street, settlement etc. This enables greater inspection of neighbouring relationships and localisation even if some of the houses are "lost" from the written sources for a certain period and there exists the threat of a break in tracing a house's family and ownership line. Our experiences have shown that it is not possible to compile a historical topography only for a limited period of time or for a single isolated structure, since neighbouring relationships traced and verified over the course of time form the very foundation of topographic research. It is always necessary to simultaneously follow at least two adjacent houses and sometimes also a house on the opposite side of the block bordering the courtyard property, and to move from the present as far as possible into the past. This logically entails time-consuming and financially demanding research. As with all research, the larger the sample of studied houses, the more accurate the results, thus allowing us to go further back into the past. We can say that if we look at a "standard" house in Prague's New Town, together with its two adjoining houses, we can with certainty go back at least to the time of Rudolf II (around the year 1600). If we compile the historical topography for a larger integrated set of town houses as was the case on Náměstí Republiky there is no problem in going

back to the second half of the 15th century. From this, it is then possible to draw certain demographic and statistical conclusions regarding the composition of inhabitants and the trades practiced at the given location during certain time periods.

For the houses on Náměstí Republiky, we created a table offering a clear overview of all owners and ownership transfers. The columns contain the individual houses identified by today's street registry numbers, the rows indicate time layers. Into the field for each property transfer, we entered all available data on the house's location, in particular the neighbours' names. By cross-referencing to the houses on either side, it was thus possible to make an immediate comparison and immediate inspection of neighbouring relationships – and thus to verify the house's location as well. At the same time, it was possible to clearly identify whenever two neighbouring houses were joined or divided. In a similar manner, we also compiled a table of market prices of the particular buildings, including data on whether a house was bought in cash or paid for in instalments. It was thus possible to conjecture which buildings and localities were particularly sought after, and to roughly date any building alterations and other improvements made to the houses.

Town manuscripts – all about the owner, but nothing about the house itself

Entries in town manuscripts recorded primarily the property circumstances of burghers and were not intended for the direct identification of a house. Registries, if at all maintained, were ordered alphabetically by the name of the property's purchaser – not by houses and their location.

There are further obstacles to determining the ownership history of a house, for instance in the identification of the trades and crafts practiced on a lot. It sometimes is not possible to say precisely whether an owner actually lived and practiced his trade in a particular house. Already in the 16th century, many houses were of an exclusively residential character. Also, in the period under review, town manuscripts did not record tenants – for instance, tradesmen working in leased spaces. Nor was it an exception that richer burghers, especially in the 16th and 17th centuries, owned several houses – not just within one neighbourhood or parish, but often directly in the same street. Such circumstances clearly complicate our research and if we are to gain an objective overview of the situation we thus need to focus our attention on the greatest possible number of buildings. It is particularly important to have a good overview of prominent residents (and property speculators) who invested their assets into the purchase of houses, just as it is done today. What is more, one and the same burgher could appear in official documents under various names or monikers. It is often very difficult to decode such a confusion of names and property relations within a small area.

A particularly confusing case of one person owning several houses within a small area, thus complicating archive research, was that of pottery-maker Jelínek, who owned up to three houses in Truhlářská Street in the 1570s and 1580s. His workshop, however, was in only one of these houses – "main" house – which is why one of his other houses studied during the archaeological excavations on Náměstí Republiky revealed no traces of pottery making. This house, later known as Špatenkovský house (no. 1115), was bought by him only in the year 1589. Prior to this, he owned (since 1577)

another house located between the house belonging to the carpenter Mikuláš Voslíček and the garden of Filip the clothmaker, where he apparently worked and had his workshop. However, before this (between 1559-1577) he lived in another house not far from here, located on the other side of Filip the clothmaker's garden (*AMP 2196, fol. 158*; *2193, fol. 393*; *2197, fol. 485*).

Buildings which were not used directly for housing the owner or his family were often leased out for the housing of poor dwellers and labourers. Income from regular rent apparently played a significant role in the burgher's overall income, since in sales contracts its collection was the subject of a special mutual agreement between buyer and seller.

It would appear that two of the earliest documented houses whose purpose was to house tenants and which were radically altered and adapted just for these purposes were the houses (nos. 1110 and 1117) owned by master builder and merchant Jan de Capauli in Truhlářská Street, which he purchased in 1653 and 1661 with the original intent of speculation in case of the (eventually unrealised) enlargement of the new Capuchin monastery. Once the possibility of the monastery's expansion had definitely passed, Jan de Capauli converted both houses into tenant homes and gave them as dowry for his two daughters (*AMP 2267, fol. 56*; *2204, fol. 652*).

Exceptions and specific features of localisation formula in sales contracts, usage of house names and specific appellations

As has already been stated, it is difficult to determine the width of a lot based solely on archive research. In some cases, however, archive sources may offer a somewhat more accurate guideline in determining the length of the lot and the location of the main entrance to the house. Descriptions of streets in the localisation formula found in the house's sales contract also indicate the placement of the main entrance to the house. Any deviation from the normally used formulation may be of great importance.

Altered localisation formula found in sales contracts indirectly helped to determine the location of a deserted Gothic hospice on Náměstí Republiky. Around the year 1600, we find formula stating that three houses standing on the corner, proven to be oriented towards Old Town's Příkop Street, stood on Šilinkova street (today's Na Poříčí Street). This apparent contradiction is only at first glance illogical and erroneous. In fact, for a certain time, these houses were indeed accessible from Šilinkova Street via an alleyway formed on the site of the hospice ruins after its definitive subdivision.

Formulations such as "by the rear gate" and "in the rear" of the house quite reliably indicate the fact that the house in question was located on the opposite side of the block along the far street, and that the land plot of the primary house on the main street originally stretched across the entire depth of the block. Only later was this plot subdivided and the place "by the rear gate" created. In such cases, it is necessary to trace also the historical development of the houses along the opposite streetfront at the rear of the original house, which again make the research more difficult.

Even in the 15th century some street segments in New Town were created primarily by the rear parts of lots of houses standing on the opposite side of the block – for instance on Senovážné Náměstí (Haymarket Square) between Dlážděná and Opletalova Streets for houses facing Hybernská Street. In this way,

one New Town street even received its characteristic moniker used during the entire 16th and 17th centuries – "In Zigl's rear".

An important guideline in spatial localisation is the traditional house name, which can provide a key for linking various written sources across the centuries. It is thus always important to pay proper attention to each distinctive name and to attempt to identify its origin. Names may refer to prominent owners or also to the other specific characteristics of a house (e. g. geomorphologic). Names found in the "Berní rula" (fiscal roster from the year 1654) often originate from the period around the middle and second half of the 16th century and refer to the time of the boom of the burghers, during which several families settled in Prague's New Town for several generations to come. This period ends towards the close of the 16th century, when these families' heirs sell the houses and large integrated family property is again divided up. During the Rudolfine era, there followed a large influx of new residents from the ranks of clerks and the lower nobility who purchased property in Prague's New Town, thus giving the neighbourhood a new, almost residential nature.

The names of the houses nos. 1113 and 1112 in Truhlářská Street – Skála (The Rock) and Skalka (The Little Rock), used from the 15th to the 18th century – referred to the rocky subsurface which is still visible today in the floor of one house's carriageway. When putting together the historical topography of house no. 1234 in Novomlýnská Street near the church of St. Clement, it at first did not appear possible, because of the isolated nature of this alone-standing house (which did not allow a determination of neighbouring relationships) and the large building changes made to the lot during the Early Modern period, to find connections to the earlier periods. One clue was provided by the archaic name U Erbů ("At Coats-of-Arms") found in the Prague housing register from 1814. This may point towards the well-known "U Erbů" medieval baths, which are richly documented in books of sales during the entire 15th and 16th centuries. In municipal written sources, we sometimes come across a specific appellation of a house according to its function. Such appellations, however, tend to be unsystematic, depending on whatever best suited the occasion, and definitely were not a regular part of these documents. Most commonly mentioned are barns, malt houses, distilleries and breweries – all of which were expressions of what probably was the most common and most profitable trade among New Town burghers. Malt houses and breweries were commonly found in houses, and we may infer from the many examples that they stood not only on the houses' courtyards, but frequently formed a direct part of the streetfront, where they interrupted the frontage series of residential houses. Whenever books of sales contain a description such as "house with brewery and malt house", this is a traditional description of a specific property with above-standard value and above-average market value, which usually also included a luxurious residential house. Written sources from the 15th to 17th centuries show a similar standing for butchers' houses with a butcher shop located on a nearby public market dedicated for this purpose – "houses with meat shop". Other types of shops, workshops or manufacturing structures associated with other crafts (with the exception of above-mentioned ones) are almost never mentioned, which does not mean that they did not exist on the lots. An exception are several provisions found in inheritance inventories and testaments, although only if the workshop and its equipment were assessed posthumously as forming a prominent part of the movable property which were of high importance in the inheritance hearings. It is not until the "fiscal roster" of 1724 (the part

of the Theresian cadastre) that pubs and taverns (serving beer or wine) and other trades are explicitly mentioned. An especially cautious approach is required when dealing with names such as "poustka" (wasteland), "spáleniště" (site of a fire) and "zbořeniště" (site of a ruin), which may – but need not – indicate a poor state of a house (especially during the time of land speculation after the Battle of White Mountain).

One example is the series of appeals from the year 1646 (i. e. from the time after the White Mountain Battle when the property seizures and land speculations flourished) addressed to the town council by the merchant Daniel Natanael Kunštát, in which he asks for permission to join seven former housing lots into one single property in order to build a large brewery along the north-eastern frontage of Senovážné Square. In order to achieve this merging, which would result in one property burdened by only single tax payment, he consciously describes the purchased houses in the most gloomy manner.

The distinguished Natanael Kunštát of Kriegsfeld, burgher and councillor of the New Towne of Prague, hereby did describe the house of Štěpán Kohout lying between his own garden on the one side and that of Baltazar Werner on the other, wherein there is located one chamber on the ground level and another above, in which the self-same Štěpán Kohout had made a chamber for himself having no chimney, in the same chamber along the right side is a window 1 and 3/4 cubits in height, opposite the door a window 3 and 1/2 in height and 2 and an eight in width and one small window next to it made of loam. Of the rest, there is no thing, no stairs nor floors, it all being fit for demolishing. Asking for this to be recorded. (*AMP 2204, fol. 290*)
... said house being abandoned and in a state of collapse, in which people cannot reside, Mr. Kunštát requests kindly for the bailiff and burgomaster to be inclined towards him ... this place being so abandoned it cannot be made use of, so that they may join this place to the first places registered in the books. (*AMP 2204, fol. 290v*)
Daniel Natanael Kunštát has purchased for himself and his wife an abandoned place, once belonging to Jan Kratochvíl, next to the house once belonging to Jan Mluvka for a sum of 20 Rhein guilders. Upon the request of Daniel Natanael Kunštát this humble place is registered into the books and joined to the house which he has purchased from Matouš and Ludmila Štička. (*AMP 2204, fol. 390*)

Types of town manuscripts and what information they have to offer. Books of sales as a foundation for historical topography

The very backbone of archive research concerning historical topography is formed by a continuous series of books of sales, which by far contain more than mere records on the purchase and sale of houses, but also register the most diverse range of property settlements and transfers. If the books of sales prove insufficient for completing a list of successive owners, it becomes necessary to turn to the study of secondary manuscripts such as books of testaments and inventories, forfeitures, obligations and pledges, orphans' books, marital contracts, books of the Office of Six Councillors ("šestipanský úřad"), or the burgomaster's register of books on sales and judgments. Every such manuscript has its specific characteristics and may provide quite different information. Although research is founded on the study of books of sales, when putting together a historical topography it is important to properly complement and combine the information they offer with information gleaned from other types of books.

Nevertheless, books of sales hold a specific and privileged place among the other types of books. This is because they contain not only entries on the sale of houses, but also record the most diverse range of property transfers. They are the only source that may (and often does) contain records and information which should have been found in other manuscripts from the New Town office – books of testaments, obligations, quietuses and the like. We should especially bear in mind that town books recorded primarily burghers' property and legal relations, property transfers and outstanding debts. They were never intended to be used for the direct identification and description of houses or trades performed on a lot, i. e., the main things that today's archaeologists and historians are looking for. A burgher's livelihood was not of importance for the transfer of a property and, with the exception of more complicated inheritance hearings, there was never the need to request and obtain a detailed description of the house and its furnishings. Such information is contained in the texts only indirectly, and often not at all. The house's location was determined solely by the name of the relevant parish and street and using the names of the neighbours on either side (although this information is frequently entirely absent). Matching a house to today's registry number tends to be difficult and requires a comparison of all available written sources, including the various types of town books up to the most recent.

Research is always founded on establishing a line of sellers and buyers (or testators and heirs etc.); the identification of the house (a burgher's residence) follows afterwards. At the same time, it is important to carefully separate the house in question from other houses owned by the same person. The specific type of manuscripts generally contains several entries for a particular house and owner – or sometimes none at all. During the period under review, whether such an entry was recorded depended solely on the burgher's willingness and needs and was not required by any higher authority such as municipal or regional government. Although it definitely was a good and useful habit to have one's property entered into the town books, this depended, among other things, on the applicant's solvency (this was a paid service) and on his sense of responsibility and neatness. In this regard, the ability of town books to provide useful information fundamentally differs from the systematic records contained in more recent financial registers and housing rosters (of primary use for local history are the Berní rula of 1654 and the Theresian cadastre).

Books of testaments and inventories

After books of sales, the second most important sources of information are undoubtedly books of testaments and inventories. These contain a detailed catalogue of the deceased's assets, drawn up primarily for its better reckoning and division during inheritance hearings. They allow us to recognize precisely the burgher's standard of living and his house's furnishings, in particular the attractiveness of the house at the time of his death. Drawing up inventories (and testaments) was not a matter of course, however, and depended much on the owner's social standing and – in the case of testaments – on his sense of responsibility and insistence on order. The preserved inventories are thus most likely to be of more wealthy residents or from otherwise prominent houses. In any case, if they are available they offer an extremely good overview of a household's furnishings and everyday life.

Fig. 1. Reconstruction of probable proportions of the house of bell-maker Brikcí of Cinperk in Široká (Jungmann) Street in the last quarter of the 16th century with location of bellmaking workshop, made on the basis of entries in manuscripts from the New Town office (books of sales, testaments, inventories and the Office of Six Coucillors). The location of the more recent Bellmann's bellmaking workshop from the 19th century, which followed the baroque Dietrich's workshop, was determined on the basis of information from the Theresian cadastre and the records office of the Prague municipality. Light blue – maximum proportions of the Zvonařovský house (1571-1599); orange – Bellmann's houses with bellmaking workshop; dark blue – location of Brikcí's workshop; green line – boundary of monastery gardens from 1418; upper red line – boundaries of permitted construction of courtyard houses after 1418; lower red line – boundaries of medieval street development (production area).
Obr. 1. Rekonstrukce pravděpodobného rozsahu zvonařského domu Brikcího z Cinperka v Široké (Jungmannově ulici) v poslední čtvrtině 16. století a lokalizace zvonařské huti na základě zápisů městských knih (trhových, testamentů, inventářů a šestipanského úřadu). Poloha mladší Bellmanovské zvonařské dílny z 19. století, navazující na barokní Dietrichovskou, byla stanovena na základě údajů Tereziánského katastru a spisovny pražského magistrátu. Světle modrá – maximální rozsah Zvonařovského domu (1571-1599); oranžová – bellmannovské domy se zvonařskou dílnou; tmavě modrá – lokalizace Brikcího dílny; zelená linka – hranice klášterní zahrady od roku 1418; horní červená linka – hranice povolené dvorní zástavby domů po roce 1418; spodní červená linka – hranice středověké uliční zástavby (výrobní část).

Prior to his death in 1599, the house of the well-known bellmaker Brikcí of Cinperk in Široká Street (today's Jungmann Street no. 747 – *fig. 1*) was home to a total of 12 members of the household – besides Brikcí and his wife, this included the families of both his sons, two cooks and three servants. Besides the inhabited part, the house also included a bell-making workshop (in the courtyard) described in much detail, including unfinished products, and a shop with ironware. The house's upper hall served as a social space as well as a dining room and bedroom for the guests. There were two large tables and benches with fourteen mattresses for sleeping, on the wall hung a horse harness with halter and along the wall there stood a tin basins – a luxury for its time, as were the multi-branched brass candlesticks on the walls and the portrait gallery of members of the family hanging next to a portrait of Emperor Rudolf II. On the same storey was Brikcí's private office, which was decorated with an aristocratic coat-of-arms and contained a desk and a bureau cabinet with important documents such as contracts and promissory notes (sureties). On the wall was a map of Vienna, Hungary and Moravia. A chest contained certain small products from the workshop, guild bellmaking tools and a pistol. Brikcí's private bed chambers contained additional artistic objects and a library (56 volumes) whose most outstanding item was an illuminated Czech bible bound in black silk with silverwork. In addition to much jewellery, Brikcí owned what even then was an exclusive luxury item – a pendulum clock with two cymbals, probably produced directly in his workshop. The clock stood, together with a mangle, by the doorway to the upper hall. No less interesting is the description of the ironmonger's shop located somewhere in the house together with the distribution storeroom. The assortment of goods included metal casks, bundles of bar iron, a supply of steel and nails and various tools such as saws, wedges, shovels, sickles and pitchforks. Also available were cowbells, wires, kitchen scales, sheets of paper and rolls of canvas. These goods

were stored and on offer next to supplies of sugar, flour and diverse spices (primarily saffron, ginger, nutmeg and pepper) which were kept in chests from which they were weighed and sold directly in the ironmonger's shop (*AMP 2209, fol. 194*).

Usually, descriptions of burgher households do not offer a picture of the layout or ground plan of a house, especially its inhabited part, since historical documents tend to describe only those rooms containing valuable inventory – and this without any standard order. We find a different situation in the lot's courtyard and manufacturing parts where, in some cases, the preserved inventory even allows us to reconstruct the space's working arrangement – the location of production and commercial structures and their spatial distribution within the individual spheres of activity located behind the streetfront tract.

One example is the house with a brewery owned by Tomáš Koník in Dlážděná (Hybernská) Street (*fig. 2*). According to an inventory produced in 1597, there were three different spheres of activity located one after the other behind the residential house, each containing various spaces. The house lot contained a passage through the whole house from Dláždění Street (where the main entrance was situated) and through the barn to Senný trh (Haymarket), from where the malt house was supplied with grain. Of course, any reconstruction performed on the basis of the recorded inventory is only of an schematic character and cannot describe the individual structures' exact location and spatial extent.

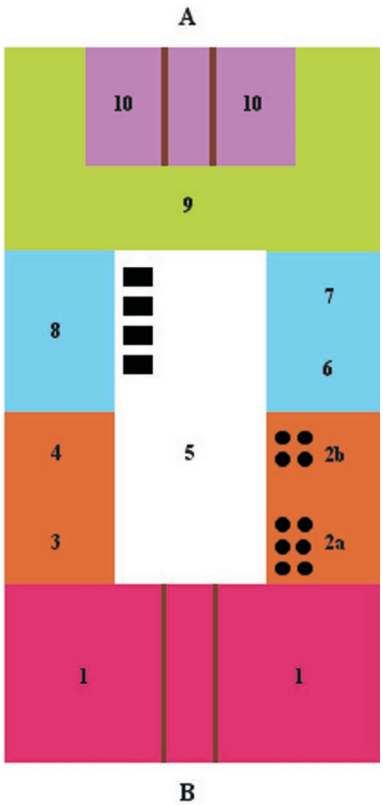

Fig. 2. Diagram of production on the lot belonging to the Koník house with brewery. Reconstruction performed on the basis of inheritance inventory from 1597. A – Senný trh; B – Na dláždění; 1 – residential house facing the street; 2a – storeroom for beer barrels (for sale); 2b – storeroom for beer barrels (for aging); 3 – sties (20 pigs); 4 – stables; 5 – courtyard (4 wagons and a cart, work table); 6 – malt kiln with inhabited ground floor (sleeping chamber); 7 – tools storage; 8 – malt house; 9 – garden; 10 – barn with through-passage.
Obr. 2. Provozní schéma na parcele Koníkovského domu s pivovarem. Rekonstrukce na základě pozůstalostního inventáře z roku 1597. A – Senný trh; B – Na dláždění; 1 – obytný dům při ulici; 2a – sklad pivních sudů (prodejní); 2b – sklad pivních sudů (kde pivo zraje); 3 – chlévy (20 prasat); 4 – konírna; 5 – dvůr (4 vozy a kára, pracovní stůl); 6 – hvozd s obytným přízemím (komora ke spaní); 7 – sklad nářadí; 8 – sladovna; 9 – zahrada; 10 – průjezdná stodola.

Testaments or wills usually offer additional information about the deceased, his assets and familial relations. We can subsequently learn the name of the heir primarily from entries in the books of sales made on the basis of the drafted and confirmed testament, although much time could have passed between the execution of the will and the actual entry of the new owner and his property into the town books. In addition, for all types of entries, the date of entry at the municipal office may differ markedly from the actual moment of the property's transfer to the new owner, which may have taken place several years prior to the entry in the books.

We often do not learn of a burgher's trade and place of residence until we read his last will and testament. When working with testaments, much attention must be paid to the final clause containing the names of witnesses – usually neighbours or close friends who might have been present at the dying person's bedside at the critical moment and who thus witnessed the last will. Because of personal ties, in addition to neighbours we very often see the deceased's closest friends and guild colleagues, who were often named guardians of any orphaned children and trustees of the deceased's property. (We thus find them in other records as the house's seller, representing orphans

who are still minors.) This information allows us to estimate the burgher's standing within the guild and his social standing in general. Testaments also offer a detailed catalogue of debts owed and due. The testament sometimes also mentions the state of materials in stock and finished goods in the workshop. If so allowed by his state of health, the testator gives any last instructions for the payment of debts and the completion of deliveries. This offers a picture of the workshop's or business's turnover and production, and about concluded contracts and sales.

... I hereby leave all my estate to my wife Marta... Floryan the armless owes me 300 groschen for fish, the bugler in Slaný 720 groschen ... Gregor from the château 360 groschen, the innkeep from Vrbnice 180 groschen ... I leave my ward Václav 600 groschen ... at Slatina I bought fish in 2 cartloads at 7 pails each, 2 at Bořkovský pond by Pardubice, 1 cartload and 5 pails at Malkovský pond ... last will witnessed in council by Šimon the carpenter and Václav the weaver. (Testament of Jan Přigmyn the Jew, fisherman, 1555 – *AMP 2207, fol. 256*)

Testaments and inventories also inform us about other sources of income for the burghers, in particular from agriculture, since in addition to assigning the heirs to inherited movable assets, they also assign heirs to all real estate including fields, vineyards, hop-fields and gardens. The burghers of New Town often cultivated grain, hop and grapes for their malt houses, breweries and distilleries. Other houses owned by the testator may have been used for tenant housing, and thus represented another, not insignificant, source of income. In addition to cash, a prominent items found in inventories and testaments are certain payments in kind – stored grain, malt, beer and wine, and piles of wood, all of which were carefully inventoried and included in the inheritance. The testaments of maltmasters and brewers frequently included sureties (promissory notes) for delivered goods in which customers who could not pay in cash pledged their personal jewellery as collateral.

1592 following the death of maltmaster Jakub Holyan, burgher of the New Towne of Prague, his estate has been searched through and assayed. The house, called "U Brotánků" and standing on Na Poříčí, with barrels, tubs and all which is used for the brewing of beer, also all which is fixed by plaster, brick and nail, with tables, chairs, benches, chains and a metal wheel for stripping wood – all assayed at 72000 Meissner groschen. Further:
hop-field beyond the gallows 3600 groschen
wood on piles one and two 9000 groschen
grain which following the death of the departed was found at the price as paid this year, as marked in the inventory
oats 63 strych[1)] at 60 groschen 3780 groschen
rye 23 strych 1560 groschen
wheat 101 strych at 120 groschen 12120 groschen
wheat malt – 10 at 2400 groschen 24000 groschen
barley malt at 3000 groschen
15 barrels of light beer at 150 groschen 2220 groschen 30 kreutzers
4 barrels of bitter beer at 540 groschen 2160 groschen
4 batches of bitter beer, each batch 10 barrels, at 540 groschen a barrel 21600 groschen
8 batches sold at 420 groschen 30 kreuzer 3600 groschen
copper and brass kitchen utensils 600 groschen

Note 1:
An old Bohemian measure roughly equal to 8.2 bushels (translator's note).

knives with silver handles, also spoons which the widow Ludmila did not use until after the death of her husband 540 groschen
the sum of this whole estate from ground to gable is 163080 groschen 35 kreutzers.
Whereas the sum shall be divided in four parts among: the widow Ludmila, Daniel and Dorota, son and daughter of Ludmila, and Anna daughter of Jakub Holyan by his first marriage. Each share comes to 40740 groschen 38 kreutzers. The widow Ludmila is obliged to pay the debts remaining to the deceased, as given in the inventory, in total 16260 groschen ... (*AMP 2208, fol. 407*)

Books of the Office of Six Councillors

From an archaeological and historical building studies point of view, important information on an urban lot's technical and hygienic facilities may be found in the books of the Office of Six, in which six municipal clerks elected for this task addressed various disputes between neighbours as well as property relations between the town and private property owners (annexations of street properties and embankments, extensions of arcades into the street, permission to connect to aqueducts, permission to build fountains or lay boundary stones etc.). A special committee of aldermen was established to address such issues directly on site. Quite common were disputes related to walls along property boundaries, gutters, gullies and drains, and generally issues related to water flowing from a property – both waste water as well as "snow water" and "rain water". We also frequently find agreements related to openings and passages in the walls bordering two neighbouring houses. The subsequent contracts contain very clear agreements between the two neighbours or official instructions for solving the dispute.

1556. Burian the Boilermaker vs. Marta Strnadka.
This record illustrates the manufacturing activities of a foundry workshop in Široká (today's Jungmann) Street. Burian's workshop in house no. 748 was one of the largest local metal-working shops in the period around the middle of the 16th century.
The officials were asked to address a dispute among neighbours regarding a shed constructed by Burian the boilermaker in which he "made two chimneys". The neighbours agreed as follows: Burian shall wall in the chimneys in the shed so that the dividing wall, which is below the shed, may serve both neighbours in the sense that they may build on it, with the exception that, should something be built, "no window leading from Burian's cellar may be blocked". (*AMP 2149, fol. 99*)

1560. Brikcí the Bellmaker vs. Kryštof of Plzeň.
This record documents the different usages of neighbouring courtyard plots, which was the source of the conflict. While Kryštof used his courtyard in a more than utilitarian manner (e. g. for keeping poultry), the ennobled burgher and famous bellmaker Brikcí of Cinperk arranged his home (no. 747) to reflect his new social standing – for instance, by developing a decorative garden and flower plot on his courtyard property.
Brikcí the Bellmaker accuses his neighbour of several offences against good neighbourliness: Kryštof of Plzeň had an opening with a cover built facing the garden of Brikcí's house, said opening being at a place where there had never

been one before. Kryštof's chickens fly onto Brikcí's garden and cause damage there. The new structure on Kryštof of Plzeň's lot faces into Brikcí's garden. Kryštof "emits filth onto Brikcí's garden" from his slough. Kryštof of Plzeň defends himself by claiming that the garden does not belong to Brikcí, but to the monastery, and also that he closes the opening whenever "the servants are doing something". The officials found in favour of Brikcí on the grounds that "a neighbour shall not make any sight nor damage unto his neighbour". They also obliged Kryštof of Plzeň to make redress as the drain is concerned. (*AMP 2146, fol. 34*)

As an important part of a property, sewers were repeatedly included into contracts on the purchase or sale of a house, which then also contained agreements regarding their maintenance. For instance, the open gutter passing across the lot of the later Hašek house in Štěpánská Street is recorded in written sources from the 16th to 18th centuries. We can reasonably assume that it is older in origin, possibly dating from the Middle Ages.

... the gully flowing from the adjoining neighbour (shall) be blocked at his expense and the second, leading from the house of Bílinský to the house of the seller, shall be left open for all eternity so that it may flow only with rainwater and does not emit filth, for now and all time... (*AMP 3770, fol. 27*)

The following entry from the year 1587 relates to the malt house at reg. no. 1076 and a gully which ran across the block from Na Poříčí to Truhlářská Street:

... in addition I must insist in particular that the flow of water, which goes from our house of Talavaškovský and across the garden thereof and the Pašinkovský house to Truhlářská Street, shall for all eternity flow freely without being hindered by the spouses nor all their future generations, and may said gully not be blocked by anyone, so that it may not flow back to the house of the self-same Talavaška. And should the water ever be blocked, then let it be conveyed from the neighbours, meaning the owners of the self-same Pašinkovský house... (*AMP 2197, fol. 37*)

Another important part of a house's sanitary facilities were wells. These are mentioned in written sources only if they were a joint facility used by both neighbouring houses. Similar agreements are found relatively frequently. A quite unique case, however, is an agreement between neighbours regarding the form and functioning of a joint privy at an as of yet unidentified New Town house from around the year 1500:

The contract has been made between Matěj Křížek and Mikuláš, neighbours on either side, regarding the privy jointly owned ... and as it came to be a hindrance to Mikuláš ... he thus submitted for the privy to be done elsewhere in his house ... and they shall use it commonly and clean it at equal expence ... and may it be large enough in size so that it shall not require cleaning for five years ... if this should come to pass after ten years, Mikuláš shall empty it at his own expence. (*AMP 2091, fol. 20*)

Books of forfeiture and orphans' books

Forfeiture ("zvod") is a special form of settling debt in which the town council assigns a house to the creditor after all other possibilities for paying a debt have failed. The house is thus forfeited to the person to whom its original owner owed money. The creditor is introduced ("zveden") into ownership, essentially without regard to the difference between the amount owed and the real market value of the house. Promissory notes in which the house is put up as collateral for the debt thus frequently contain the phrase "under the menace of forfeiture of house and putting away the keys" ("pod zvodem zmocněním a klíčů složením").

Jindřich Buchal, appearing personally before the council, admits that he owes the esteemed counsellor Jan Christofor Sferin of Ferin and his wife Kateřina and all future generations his right and true debt of 24000 Meissner groschen, which sum he shall be obliged to pay ad actum of this entry by the day of St. Gall nearest in next year. And that, so being requested, he did insure these 24000 towards his creditors with the house in which he resides, this under forfeiture and all proper penalties. And the law being observed as the sun sets, the forfeiture was enacted and keys put away presented. Addendum: *Jindřich Buchal, having been announced from the bailiff and the lords the satisfaction of the debt owed Chrisostom Sferin of Ferin as recorded above, announced in the council that he accepts the forfeiture. 1625.* (*AMP 2228, fol. 304*)

Orphans' books represent a kind of parallel to testaments and inventories. They contain entries on the assignment of property to surviving orphans and appoint trustees or property administrators until the children reach full age. In addition, they are the only type of town book whose records are ordered by street and neighbourhood, making them a kind of precursor to housing rosters. Orphans' books can be of significant help for archive research, particularly when a period of ten or more years has passed between the time of the homeowner's death and his children reaching the age of maturity, after which time we cannot find any connections in other town books.

In one example, a record found in the orphans' book for the Zderaz neighbourhood helped to bridge the absence of written reports on house no. 716 in Palacký (Pasířská) Street for the long period from 1584 to 1651 and helped to connect the otherwise unrelated names of the tailor Jan Pučer (1584) and the Italian brickmason Mirani (1651). The information was not found in the books for the neighbourhood of Our Lady of the Snow, where the house in question was located, but in the books for the Zderaz neighbourhood, the site of another house owned by the deceased.

The tailor Jan Pučer died around the year 1610 and his estate was entrusted to trustees until his two surviving daughters reached full age (orphans' book for the neighbourhood of Our Lady of the Snow – reference to Zderaz neighbourhood). According to the records, the settlement between the two daughters Anna and Barbora – by now married and of age – was not performed definitively until 1628. The house in Pasířská Street (no. 716) is taken over by Anna's husband Jakub Jiří Karolydes, who undertakes to pay his brother-in-law and brother-in-law's wife Barbora her share of the inheritance in the amount of 16380 groschen. Being unable to pay the sum all at once, they agree to payment in instalments of 1800 groschen a year with an advance of 1800 groschen (Jakub Jiřík Karolydes is the son of Daniel Karolydes of Karlsperk, a prominent New

Town burgher from the Rudolfine period – intellectual, humanist and owner of a private printing shop in New Town). The house is inherited by the daughter of Jakub Jiřík Karolydes, Alžběta, who married the New Town brickmason Mirani some time before 1651. Not until the inheritance hearings in favour of her child, the underage orphan František Karel Mirani, do we find another entry in the books of sales related to the said building (*AMP 2229, fol. 38*; *2204, fol. 510*).

Books of obligations, court books and books of wedding contracts

Other types of town books – books of obligations, court books and books of wedding contracts – generally do not offer any further essential information on building history and are more likely to help flesh out the picture of the burgher's life and times. Because, with certain exceptions, they do not contain information on the house in which the burgher resided, they are of limited use in putting together a list of houses' owners. Their significance thus rests solely in the fact that they can confirm that a certain individual was active in the given place at the given time in his active years, that he practiced his trade here and that he probably lived in this location. We may, with reservations, consider the signing of a wedding contract to represent the potential time when two people began living together in a new home, although this fact is usually not confirmed until what was called the "mutual matrimonial surrender of property" – which is usually entered in the books of sales and can be connected to a specific house. Books of obligations, which record various types of debts and receivables owed to each other by private individuals and institutions, have a similar level of significance for historical topography. In some entries, the debtor "insures" the amount owed through his own house, i. e. if necessary he undertakes to pay off the debt via the forced sale of the house – although it is not specified which house is being referred to. This can be documented only in combination with the relevant entry from the books of sales. In books of pledges, creditors seek to claim their accounts receivable or heirs vocalise their belief that they have been left out of inheritance hearings.

Books of testimony contain the testimonies of witnesses as well as injured parties in various disputes and conflicts, and vividly describe the life of burghers. While some burghers' names make their way into official records once in a lifetime, the more "boisterous" and conflict-oriented characters are found repeatedly in similar types of records.

The following entry from a book of testimony records testimony regarding a quarrel between Valentin Sobiehrd, potter from Poříčí Street, with one of his guild colleagues regarding journeymen. Unfortunately, although the entire brawl is vividly described, it offers little additional information on the essence of the dispute. Somewhat later, according to an entry from a book of sales, the same potter was unable to pay a house in Truhlářská Street (reg. no. 1114), which he had purchased from his mother-in-law in 1513.

Testimony on Valentin Sobiehrd the potter by Jan, son of the alderman and pursemaker: *... and so Sedláček lunged for Valentin with his epee and struck him, after which Sedláček fell into the mud. And so Valentin bended down to him, and they did clench together ... and did together scramble for the sabre. And so Bartoš, joining in, did twice strike Valentin, after which Valentin did release Sedláček and he did run from them and they after him...* (*AMP 1046, fol. 82*)

Another entry involves a property settlement following a divorce. Following the settlement, the wife disavows all claims to inheritance:

Matěj Kroupa and his wife Dorota, when they could no longer be together, to which they both acquiesce, to be free of each other... each to practice his trade without hindrance from the other ... and he Matěj shall give her the bedding, chest, table linen and two stools. And she Dorota shall have no right to Matěj and his estate for now and forever ... (*AMP 2091, fol. 38*)

Legal aspects of entries in town books, aldermen in the role of justices of the peace

In their time, all property transfers, bequests, testaments and other texts contained in town manuscripts were living legal documents, and were thus of the corresponding form and contained the proper requisites. Their wording was far from haphazard; particularly important were standard formulations which ensured that the record was valid in its entirety. The best known formulations include easily understood sentences such as "all which is in the house is fixed by plaster and nail" (unmovable property with fixed interior furnishings) or "purchased for himself and all future generations" (automatic inheritance of the house by heirs). A donor or seller could also "stipulate for himself" part of the transferred property, for instance lifelong use of a flat, shop or workshop located in the house, or part of the money in cash. Less clear formulations include sentences such as "reservation of rights", which indicated a very important circumstance that the property's donor or testator could change his mind at any point in the future and cancel the contract. A similar meaning was assigned to the formulation "the above-mentioned entry allowing", which was rather applied in cases when both parties agreed to the cancellation of the entry. If a standard formulation was missing from the text of the entry, it could have serious legal consequences.

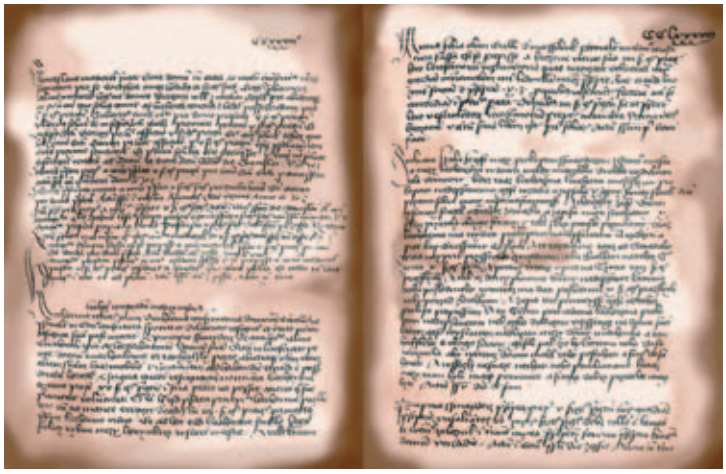

Fig. 3. Latin and Czech entry in the book of sales of Prague's New Town from the year 1500 regarding the settlement between Prokop the shopkeeper from Old Town and Kateřina, widow of Duchek the builder.
Obr. 3. Latinský a český zápis v trhové knize Nového Města pražského z roku 1500, týkající se narovnání mezi Prokopem šmejdířem ze Starého Města a Kateřinou, vdovou po Duchkovi staviteli.

In the donation contract which preceded the following entry, Kateřina widow of Duchek the builder forgot to include the formulation "reservation of rights". For this reason, when she decided to annul the contract and recover her former property, she had to pay the recipient Prokop relatively high compensation, the amount of which was agreed to by both parties with the assistance of friends and upon a proposal from the town council. The entry is from the year 1500 and relates to one of the houses on the lot of today's Lidový dům in Hybernská Street (*fig. 3*):

The contract has been made between Prokop the Shopkeeper of Old Towne and Kateřina the widow and erstwhile wife of Duchek the builder of houses. And this same Kateřina did relinquish in the town books and write to the same Prokop her house and other estate, without reservation of rights. And wanting again this house and her estate freed of this self-same bond and entry, so did both parties through friends and also through lordly intercessions agree, that this same Kateřina shall present the same Prokop five and thirty

three-score of Bohemian groschen, this doing unevenly from the nearest day of St. Vitus falling within one year's time, paying on the self-same St. Vitus five three-score of Bohemian groschen. And then in one year again on St. Vitus 7 three-score of Prague groschen. And so on until the sum written herein above is met, except for the final year in which she shall pay the final 5 three-score of Prague groschen, the years always running. And let the first entry be released by this same Prokop. And may Kateřina with this sum, provided to the above Prokop or his heirs, assure her house, standing as it does on Dláždění between the houses of Machník and Ranhuský on either side. And if in any year she shall not do as herein described, let him be able to act against this same house and have his satisfaction. And may all troubles, ill favour or calumny which have been between them fall away and let them be good friends. (*AMP 2090, fol. 284*)

In many entries, the town council takes on the role of a kind of public authority for solving common family disputes, reconciling quarrelling family members and offering proposals for the most diverse forms of compensations and settlements. In fact, all types of documents which have been described here were concluded directly in the town offices in the personal presence of the burgomaster and the members of the town council, who confirmed the validity of the concluded contracts.

In the year of our Lord 1650, under the officiating of the esteemed Aleš Ferdynand Wratislav of Mitrovice, chief councillor of the New Towne of Prague and bailiff Václav Augustin Kavka and the lord councillors to whom has been presented a dispute for resolution between mother and son – Magdalena Kolínská in good memory the widow of Jan Kolínský fellow councillor and burgher in the New Towne of Prague and her son Václav Kolínský. As Václav Kolínský has virtuously entered into the state of matrimony, he would like to practice the trade which he dutifully studied and besides many other honourable burghers' trades did want much hard work, but for lack of resources he cannot, so let his mother Magdalena Kolínská be of aid to him. In response she Magdalena Kolínská does state that her son, in his often poor behaviour towards her, did so turn her against him that she shed her obligatory motherly love and he did squander her love to him, and besides that she has no monied resources at hand. The lord commissioners thus seeing that there is something to be done between these two most bound by blood, being mother and son, they did entreat Magdalena through their intercession to be disposed to this and vouchsafed that she is willing (to give him) the house in Truhlářská Street and also, so that he may be able to perform this trade, a soap-making kettle for boiling soap, properly repaired, and with it a smaller kettle for candles, and what she could give from her smaller dishes not necessary to the household, and to this handing over she did bind herself. Further, as for the begin of any business is needed honest money, she did bind herself in this contract to provide for the start of his trade 30 three-score of Meissner groschen in coins and when the mother does see that he behaves rightly with them, she shall give him another 30 three-score of Meissner groschen. And since she Magdalena has shown herself so motherly and kind to him, so shall Václav be by the lord commissioners admonished to treat his mother with all true fidelity and thrift. Which he did swear before the council, thanking her as befits a son. (*AMP 2204, fol. 477*)

Conclusion

Archive research can offer quality results only if we simultaneously study at least three houses at once – the house under review and its two immediate neighbours – by analysing written sources and by systematic tracing all existing and preserved records and documents from contemporary reports as far back into the past as possible while identifying the historical house with the current house number. A historical topography cannot be elaborated for an individual isolated house or a limited period of time, since neighbouring relationships over the course of time form the absolute foundation of such research. The limits and possibilities of this research and its use in building history and archaeology can be summarised in the following table:

what can be reliably determined	what can be determined with reservations
the chronological order of a working in house's owners lot,	tenants and tradesmen leased spaces on a residential houses and tenant houses
order of houses on the streetfront	precise spatial location of house on the specific lot (for houses disappeared for a long time without any above-ground remains)
location of entryway, orientation towards street and depth of the lot if it stretched across the entire block	width of the lot (for houses and adjacent buildings which no longer exist or were rebuilt from the foundations up)
joining of properties or subdivision of lots, neighbourly relationships	precise spatial description of the house and lot boundary
house's market price and tax burden	actual state of house at the time
malt houses, breweries and houses with meat shop, gardens belonging to the house	other types of manufacturing buildings and workshops, shops, pubs and taverns, water gullies

The backbone of archive research is formed by books of sales, whose entries are usefully supplemented by many secondary town books, of which the most important for historical topography are books of inventories and testaments and books of the Office of Six. The ability of town books to provide useful information differs significantly from later sources of fiscal nature which systematically recorded all houses from the viewpoint of centralised administration. The entry of records in the New Town office's books was entirely dependent on a burgher's goodwill, solvency and actual needs. For this reason, records are unsystematic and of varying quality. The study of books of sales helps to create an ownership line for an individual house and to determine the crafts and trades practiced on the lot. This is always based on the compilation of a set of possible acquirers; the identification of the specific houses (a burgher's residence) and persons is performed subsequently. Books of testaments and inventories can tell us about the burgher's economic standing and the furnishing of his household, and sometimes allow us to reconstruct the working arrangement on the lot and to locate the house's manufacturing

and workshop areas. They also provide information on other sources of income for the house's owner, particularly from agricultural activities and tenant housing. Books of the Office of Six provide information on houses' and lots' sanitary and technical facilities, in particular as regards wells, gullies and building activity along the boundaries of a lot (if part of a dispute or official proceedings). For the most part, other types of town books do not offer any fundamental information on a house's building history, but rather help to flesh out the picture of the burgher's life and the customs of the time, particularly in the area of property relations. They are particularly useful in clarifying genealogical lines and familial and neighbouring relationships when identifying a house's owner.

The selected and cited texts may give the impression that the use of archive studies in building history and archaeology is an almost ideal and error-free method. The types of benefits offered by the individual types of town books may lead us to believe that they are always and everywhere a source of easily accessible information. This is far from true, however, mainly because of the unsystematic nature of these sources and the varying quality of the entries contained therein. We have selected here only those examples (containing better than average information, in a way) which directly allowed us to connect data from fieldwork and archival studies and to identify a specific house. In many cases, however, this it not possible and the result of exhaustive searching and reading of archival materials is practically zero. It always depends on the amount of preserved archival material and frequently on luck and the method of research, which – in this field of study – often resembles detective work.

Resumé:

Na základě několik let trvajícího topografického studia zaniklých domů v areálu bývalých kasáren na náměstí Republiky nabízí příspěvek zkušenosti ze studia knih novoměstské kanceláře pro období od 15. – 19. století. Zabývá se využitím písemných pramenů vztahujících se k městským domům v archeologii a stavební historii a na konkrétních příkladech líčí setkání archeologických nálezů a písemných pramenů. Ukazuje meze a možnosti místopisného studia při řešení problémů a otázek, na které u historické topografie hledá archeologie často odpověď – tedy zejména při určení řemesel a živností provozovaných na parcele v té které době, při datování a identifikaci nálezů spojených s konkrétní výrobní aktivitou či osobou nebo při lokalizaci dílen a výrobních objektů. Příspěvek se dále snaží definovat, které dokumenty městské kanceláře (typy městských knih) mohou výše uvedené informace poskytnout a v jaké míře: zápisy v těchto knihách nesloužily prvořadě k prostorové identifikaci řemeslníků a jejich objektů, nýbrž k evidenci majetku měšťanů obecně, a záznamy v nich nejsou systematické, ani nejsou přímo přiřazeny ke konkrétnímu místu.

Právě přesné místopisné přiřazení je hlavním úkolem topografického studia. Hlavním pramenem k tomu jsou záznamy hlavní řady trhových knih, které je po jejich pečlivém vyhodnocení nutné kombinovat a porovnávat se záznamy vedlejších řad městských knih, jakými jsou knihy testamentů, inventářů, zvodů, kondikcí, obligací, knihy sirotčí a knihy svatebních smluv. Vedlejší řady městských knih (kromě knih trhových, knih testamentů a inventářů) nepřinášejí již většinou zásadní poznatky pro stavební historii objektu, spíše dokreslují život měšťana a reálie jeho doby. Ve stručnosti lze říci, že z městských knih je možné dovědět se mnohé o majiteli, ale nikoli vždy o domě jako takovém. Z dokumentů jiných městských úřadů než městské rady jsou užitečné zejména knihy šestipanského úřadu, purkmisterská registra trhová a knihy soudní (knihy svědomí).

V příspěvku je zvláštní důraz kladen na rozbor měšťanských testamentů a inventářů, které umožňují blíže poznat živnost měšťana, vybavení jeho domácnosti a někdy i prostorovou lokalizaci výrobních objektů a dílen na parcele (lokalizace zvonařské dílny Brikcího z Cinperka z roku 1599, pivovaru Tomáše Koníka z roku 1597). Jak ukázal výzkum na náměstí Republiky, lze systematickým studiem písemných pramenů z provenience městské správy určit velmi přesně sled držitelů domu, a tedy ve většině případů i řemesla a živnosti provozované na parcele v tom kterém období. Historický místopis spolehlivě zachycuje jak sled držitelů konkrétního domu, tak i počet a pořadí domů v uliční frontě, a to i u domů již dříve zaniklých, nad terénem v současné době neexistujících (na náměstí Republiky byla sledována téměř polovina domů zbořených již v 17. století v souvislosti s výstavbou kapucínského kláštera). Co však místopis není schopen bez pomoci jiných disciplín spolehlivě určit, je přesný prostorový rozsah takového domu, hlavně šířku parcely, to znamená jeho přesnou časoprostorovou lokalizaci – pokud se nejedná o nějaký význačný stavební solitér zachovaný v nezměněné stavební a obrysové podobě do současnosti. Na druhé straně, jestliže se podaří identifikovat podobný význačný objekt, existující jako prostorově i majetkově stabilní veličina po mnoho staletí, je to nesporně velkou oporou místopisného studia. Od takového domu se jako od výchozího bodu celé osnovy může rozvinout přesná rekonstrukce celé uliční fronty. Podobně je třeba věnovat náležitou pozornost ustálenému názvu domu, který může být klíčem spojujícím různé písemné prameny napříč staletími. Názvy mohou odkazovat na významné držitele a stavebníky objektu, ale i na jeho jiná specifika, například geomorfologická.

Při zpracování většího vzorku domů je možné spolehlivě stanovit pořadí a počet domů v uliční frontě, méně spolehlivě však jejich přesné prostorové vymezení a šířku parcel. Ze specifických formulací používaných v trhových smlouvách lze odvodit umístění hlavního domovního vchodu i hloubku městiště v případě, že procházelo napříč celým blokem. V tomto smyslu jakákoli odchylka od ustálené formulace (v zápisech se formule popisující jeden a týž objekt opakují) pak může být závažným indikátorem radikální stavební proměny objektu, například změny orientace hlavního uličního průčelí. Z písemných pramenů je možné zjistit tržní cenu objektu a výši jeho daňového zatížení v dané době, která ovšem nemusí nutně vyjadřovat skutečný stavební stav objektu. Podobně obezřetně je třeba přistupovat i k používaným názvům jako „poustka“, „zbořeniště“, „spáleniště“ apod., jejichž použití při majetkových převodech může mít spekulativní nádech. V textech městských knih jsou jmenovitě uváděny a popisovány pouze některé typy objektů a jejich příslušenství, zvláště sladovny, pivovary, stodoly, užitkové a okrasné zahrady, tedy příslušenství zásadním způsobem navyšující cenu objektu. Absence jiných typů, zvláště výrobních objektů, dílen a šenků, v textech novoměstské kanceláře pochopitelně neznamená, že by se na parcelách domů nevyskytovaly. Výslovně jsou v záznamech jmenováni pouze sladovníci a řezníci – ustálené oficiální výrazy „dům se sladovnou“ a „dům s masným krámem“ označovaly specifické majetky nadprůměrné hodnoty.

Městské knihy také sice evidují držitele objektu, ale nikoli všechny osoby skutečně zde bydlící a pracující, například nájemce. Řada domů již v 16. století nebyla řemeslnická, ale měla vysloveně rezidenční či naopak nájemní charakter. Dále není žádnou výjimkou, že bohatší měšťané drželi více domů, a to nejen v rámci jedné čtvrti, ale i jedné ulice – pouze v jednom z nich však bydleli a provozovali svou živnost. Spekulativní koupě a rychlé střídání majitelů bylo na denním pořádku. Jeden a týž měšťan navíc mohl navíc figurovat v úředních záznamech současně pod různými jmény či přezdívkami. Všechny tyto skutečnosti nesmírně komplikují místopisné bádání a složitý spletenec rodinných, majetkových a právních vztahů na úzce vymezeném prostoru lze někdy jen nesnadno dešifrovat.

Velkou výhodou je proto vždy co největší vzorek zpracovávaných domů, nejlépe celé osady, bloku, ulice a podobně. To totiž umožňuje větší kontrolu sousedských vazeb a tedy i prostorových lokalizací, a to i v případě, kdy se část hledaných objektů v písemných pramenech pro určité období zcela „ztratí“ a hrozí přerušení ve sledování majetkové linie. Historický místopis objektu nelze zřejmě vypracovat pouze pro omezené časové období nebo jednotlivý objekt, neboť právě sousedské vazby sledované a ověřované v průběhu času jsou naprostým základem topografického studia. Vždy je nutno spolu se zkoumaným objektem studovat nejméně také jeho dva bezprostřední sousedy (a někdy i objekt na protější straně bloku sousedící svým zadním, dvorním traktem), a to prostřednictvím analýzy všech dostupných a dochovaných písemných pramenů od současnosti směrem co nejhlouběji do minulosti. Lze konstatovat, že u „průměrného“ novoměstského domu, sledovaného v základní trojici spolu s jeho dvěma sousedy, lze bez problémů dospět nejméně do období kolem roku 1600. Pokud je místopis zpracováván pro větší, ucelený soubor novoměstských domů, lze u všech objektů dospět nejméně do druhé poloviny 15. století a u některých objektů lze data spojit s údaji W.W. Tomka pro druhou polovinu 14. století, publikovanými v Základech starého místopisu pražského.

Topografický výzkum domů na náměstí Republiky potvrdil, že u řady objektů je možné propojit údaje obou dosud publikovaných pražských místopisů (W.W. Tomka pro období kolem roku 1400 a Berní ruly z roku 1654) a překlenout tak dosud neprobádané údobí 250 let.

Osou místopisného studia je vyhledání souvislé řady záznamů v trhových knihách. Základem je vždy sestavení jakési „genealogické" linie domu z hlediska nabyvatele majetku. Je třeba si uvědomit, že městské knihy nikdy nesloužily prvořadě k identifikaci domů či živností na parcelách, tedy k tomu co v nich především hledá dnešní archeologie a stavební historie. Jejich účelem bylo zaznamenat majetkové poměry a vztahy měšťanů, přičemž způsob obživy majitele ani přesné umístění domu nebyly při majetkových převodech podstatné. Informace tohoto druhu jsou v textech obsaženy nepřímo a mnohdy vůbec ne. Ztotožnění zmiňovaného objektu s dnešním číslem popisným je proto složité a vyžaduje pečlivou komparaci všech dostupných zpráv a pramenů až po ty současné. Pořizování zápisů v městských knihách ve sledovaném období bylo závislé pouze na aktuálních potřebách měšťanů a nebylo nařizováno žádnou vyšší autoritou, například městskou či zemskou správou. Proto jsou tyto záznamy mezerovité a nesystematické a svou vypovídací hodnotou se zásadně liší od mladších centrálních berních rejstříků a domovních rol. Obecně platí, že k určitému objektu a jeho majiteli lze v městských knihách nalézt hned několik zápisů, k jinému ale třeba ani jediný. Městské knihy zkrátka nejsou zdrojem jednoznačných a snadno dostupných informací o stavební historii objektu. Jejich vytěžení a zpracování je časově náročné a v mnohém připomíná detektivní práci.

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The discovery of an Early Modern bell foundry on Jungmann Street in the New Town in Prague

Objev novověké zvonařské dílny v Jungmannově ulici v Praze na Novém Městě

Die Entdeckung einer neuzeitlichen Glockenwerkstatt in der Jungmannova-Gasse in der Prager Neustadt

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Die Rettungsgrabung in der Jungmannova-Gasse in der Prager Neustadt erbrachte die einzigartige Entdeckung des Überrests einer Gießgrube der Glockengießerei der Familie Bellmann aus der Mitte des 19. Jahrhunderts. Aufgrund dieses Fundes wurde eine topographische Studie zur Kontinuität der Glockenherstellung an dieser Stelle vom 15. bis 19. Jahrhundert ausgearbeitet, die die Existenz von metallverarbeitenden Werkstätten bereits im letzten Drittel des 14. Jahrhunderts bestätigte und gleichzeitig auf das höchst interessante Thema der nahezu ununterbrochen bis in das 19. Jahrhundert währenden Kontinuität der örtlichen Glockenherstellung hinwies. Die Jungmannova-Gasse (ehem. Široká-Gasse, manchmal wird auch die Bezeichnung Zvonařská- oder Konvářská- gebraucht) war ein bedeutendes Zentrum der Glockenproduktion und Metallgießerei auf dem Gebiet der Prager Neustadt. In seiner Blütezeit in der Mitte des 16. Jahrhunderts waren hier bis zu fünf Glockengießerein gleichzeitig in Betrieb. Tätig waren hier die angesehensten Meister dieses Faches (u.a. der Glockengießer Brikcí aus Cinperk – 1550-1599, Zachariáš Dittrich – 1716-1764, oder, als Mitglied der bereits erwähnten Familie Bellmann, Karel Bellmann der Jüngere – 1869-1884). Neben der Analyse des Befundes wurde auch die Problematik der Technologie des Glockengießens angeschnitten und einzelne Produktionsverfahren im Mittelalter und der Neuzeit verglichen.

Bell foundries and boilermakers on Jungmannova Street in the New Town in Prague – tradition and continuity in bell founding on the site from the 15th to the 19th century

The impulse for this overview was an archaeological excavation that was carried out on the lots of houses no. 744 and 745 and in the courtyard of house no. 742 in 2002-2003, and the subsequent need to identify finds from a foundry which, at the time of the excavation, were not clearly interpretable. Earlier literature dealing with the history of bell founding traditionally located the workshops of the leading Prague bell-founders of the Late Middle Ages and the Early Modern periods to Jungmann Street, but without concentrating on their exact locations. Therefore, this summary has been prepared to find the exact location of the workshops on the basis of a critical investigation of earlier literature, papers on historical building research, and a new topographical study of three houses directly affected by archaeological excavation (houses nos. 742, 744 and 745), on which no historical building research has yet been drawn up. The summary includes the entire eastern side of Jungmann Street, from the corner by the Church of Our Lady of the Snow to the corner where the street intersects with Palacký Street. The localization of the workshops operating between the end of the 15th to the end of the 16th century was taken from completed building passports for houses nos. 752, 749, 748, 747 and 746, prepared by SÚRPMO Prague. Data for

the period prior to the 15th century was taken from studies by *K. Guth* (*1918*), *A. Rybička* (*1885*), *J. V. Šimák* (*1906*) and *Z. Winter* (*1906*), which have not yet been critically verified. Data for houses nos. 741, 742, 744 and 745 was based on the author's own topographical studies. Each single name of bell-founder and boilermaker is matched with only one, main house, even though during this period these burghers may have owned numerous houses located beside one another. The decisive criterion, however, was the location of the workshop. The summary provides an illustration of the very interesting phenomenon of the continuity of local bell founding, running almost uninterruptedly over the course of five centuries – from the 15th to the 19th centuries.

According to informations from W. W. Tomek, metalworking began to spread on Jungmann (Široká) Street back in the last quarter of the 14th century; for example, a blacksmith is mentioned in house no. 744 (today part of house no. 745), a sword-maker in house no. 746, and a goldsmith in house no. 747. Although Tomek's identification of locations with particular existing street numbers must be taken with some reservations, their location on the eastern side of Jungmann Street is certainly correct (*Tomek 1870*, 53-56). In Prague in the 15th-16th centuries, there were two centres of bell founding – in the Old Town by the Church of St. Nicholas, and in the New Town on Široká Street. Evidence of metalworking and the production of metal goods was also found on Železná Street in the Old Town, which is how the street acquired its name (*Železná* means iron). According to earlier written sources, during the Jagellonian period Jungmann (Široká) Street was home to five bell foundries at once. At that time the parallel use of the street name Zvonařská (a word relating to bell foundries) or Konvářská (relating to cans) was established (*Šimák 1906*).

A preliminary hypothesis can be formulated that an important impulse behind the expansion of bell founding on Široká Street was the selling off of former monastery lands to private owners in 1418. At that time, work was under way on the triple-nave Franciscan Church of Our Lady of the Snow (the southern nave and tower) and the monastery needed resources to finance its construction (*Lorenc 1973*). It decided to sell a strip of garden land to the holders of twelve adjacent houses to expand their facilities and gardens. A Baroque reprint of the royal document granting permission for this sale has survived to date, along with Tomek's transcription of an entry from a New Town manual lost in a fire. The owners of the houses were to separate their newly acquired lots from the monastery garden with a three-metre masonry wall, and new extensions were not to be built by the owners any further than 8.86 metres from their existing houses and only to the height of the new wall (*Tomek 1870*, 53). This shifted the western boundary of the monastery land and fixed it along the line where it lies today. A critical analysis of the texts cited above puts the original boundary of the monastery garden on a line roughly 17 to 18 metres further out from where it runs today. The increase in the size of the lots attached to the houses may have stimulated the spread of more spatially demanding types of production, which metal casting most certainly was, and it may have provided additional room for storing finished products. This hypothesis may find support in the following topographical findings. An analysis of written sources reveals that bell-founders and boilermakers settled only on the eastern side of Široká Street and at the corner of Široká and Pasířská (today Palacký) Streets, right where the enlargement of the lots occurred in 1418. Workshops founded in the 15th century no longer moved into other parts of the town

and instead began to concentrate on the eastern side of Široká Street, while bell-founders moved into the workshops already established here. And thus a tradition of bell founding in this location was launched. A curious expression of this was the fact than many bells years later returned to their place of origin. So just as Brikcí Zvonař (Brikcí "the Bell-founder") of Cinperk recast the bells cast by his predecessor and grandfather Bartoš Berounský, in the 19th century the Bellmann workshop recast many bells made by Brikcí of Cinperk, the most famous bell-founder on Široká Street, whose workshop was located, symbolically, at the centre of the street, at the very core of metal-casting production.

House no. 752 (according to the original numbering – today house no. 750; the workshop of Adam the boilermaker, circa 1550)

The corner building at the entrance to the cemetery at the Church of Our Lady of the Snow has, according to *Šimák* (*1906*, 478, 505), a bell founding tradition that dates back to the last quarter of the 15th century. The presence in this building of the bell-founders that Šimák mentions, Václav (from 1474) and Řehoř Karban (from 1496), has not however been proved in a comprehensive archive study. Around 1550, the presence in this house of a New Town burgher named Adam Kotlář is however certain (*Lancinger – Lišková – Švácha 1992*). The house was bought from one of his descendants in 1583 by Brikcí Zvonař of Cinperk, who owned it and two other houses on Široká Street until his death in 1599. However, the core of his famous workshop certainly remained in the Zvonařovský house – no. 747 (*AMP 2196*, fol. 476).

House no. 749, U Kotlářů ("At Boilermakers") or Kotlářovský house (the boiler workshop of Tomáš Krumlovský, 1580-1606)

The start of a bell founding tradition in this house, which emerged upon the joining of two older buildings, is dated to the middle of the 15th century by F. Ruth, but the information that he cites has not been verified by archive study. He identifies it as the site of the foundry of Havel and Jilek Ryba. He explicitly refers to the bell foundry of Mikuláš Ryba, the gunsmith (known as Havel Ryba), occupying this house in the year 1441. His widow then married Jilek, the boilermaker and bell-founder who, in addition to taking over the shop of his predecessor, also adopted the established name of Ryba (*Ruth 1903*, 441). In 1459, he reached a contractual settlement with the son of the bell-founder Havel Ryba. Around 1501, he left the house and the workshop equipment to his grandson, Jan, who continued working there until 1514, the date from which his last will survived (*Winter 1906*, 470).

The right-hand building of the two later joined to become house no. 749 was owned prior to 1550 by a less known bell-founder named Matěj. Passing from his estate, the house briefly became the property of Brikcí's neighbour, Burian the boilermaker, who ran a workshop in the courtyard wing of the attached neighbouring house no. 748 (*Lancinger – Líbal – Muková 1980*).

The house on the left of the two that later became no. 749 was owned for nine years (from 1571 to 1580) by Brikcí Zvonař of Cinperk, who bought it with the intention of amalgamating his property into a single connected line of houses (*AMP 2195*, fol. 7). However, this aim clashed with the similar aim of his neighbour, Tomáš Krumlovský, to whom – for a substantial sum – Brickí ultimately sold the house in 1580. Tomáš Krumlovský joined the two neighbouring houses and created a base for his workshop; the established name of this house, "Kotlářovský", dates from that time (*AMP 2196*, fol. 464).

House no. 748 (the workshop of Burian the boilermaker, 1537-1562; the workshop of Tomáš Krumlovský, 1562-1580)

In 1537-1562, this site was owned by Burian the boilermaker, who owned the house for almost a quarter of a century and whose production here developed substantially. The work of Burian the boilermaker is relatively well recorded in written records. Entries in the town registers record, for example, his construction of new chimney hoods in the courtyard in 1556 or the description of supplies of iron and copper, recorded in an inventory of his estate (*AMP 2207*, fol. 72; *2149*, fol. 99).

In 1562-1580, the shop was run by the boilermaker Tomáš Krumlovský, who married Burian the boilermaker's widow. After the death of his wife and the execution of her will in 1580, however, he had to transfer his workshop to the neighbouring house, no. 749 (*Lancinger – Fajmon – Koběrská 1980*).

House no. 747, Zvonařovský or U Zvonařů ("At Bell-founders"), later U tří zvonků ("At Three Bells") (the workshop of Bartoloměj Berounský, 1528-1534; the workshop of Brikcí Zvonař of Cinperk, circa 1550-1599)

In 1528, the house was purchased from a widow named Marta Kulhánková by the bell-founder and gunsmith named Bartoš, alias Bartoloměj of Beroun, who set up a renowned bell foundry and introduced the bell founding tradition into the house (*Lancinger – Růžičková 1980*). *K. Herain* (*1918*, 15) described Bartoš's workshop as "the first example of large-scale production in a Prague bell foundry".

His son, Ondřej Zvonař, ran a boiler-making trade in his father's home in 1534-1550. In 1550, the workshop was taken over by his eldest son Brikcí Zvonař (later of Cinperk), who ran it until his death 1599 and earned renown as the most famous bell-founder of the Renaissance period in the Czech lands. An idea about the size and organisation of the Zvonařovský house can be obtained from an inventory conducted after Brikcí's death in 1599. In addition to vast storage space, the house contained an ironmongery and a metal foundry in the courtyard (*AMP 1211*, fol. 194). On top of that, in 1570-1583 the printing house of Michal Peterle of Annaberk also operated here (*Winter 1909*, 280).

The last bell founder from this family who operated in this house was Brikcí's eldest son Bartoloměj, but he only ran the workshop until his premature death in 1601 (*AMP 1211*, fol. 194).

House no. 746 (the house of the boilermaker Vavřinec Křička of Bítýška, 1557-1566; lathe-work house, 1685-1795)

In 1557-1566, the boilermaker Vavřinec Křička of Bítýška worked here, the author of the well-known contemporary technical treatise on bell casting and the casting of other items. In the last quarter of the 17th century, the tradition of metalworking was revived in the house and throughout the 18th century the building was home to lathe work.

Vavřinec Křička acquired the house from a locksmith named Jan Petržilka in 1557 (*AMP 2193*, fol. 368). Given that it was already a very small house at that time, almost without any courtyard land and consequently without any production space, it can be assumed that Vavřinec Křička worked as an external specialist in next-door Brikcí's workshop.

In 1685-1714 the lathe-worker Virgilius Steger worked in this house after acquiring it from the municipal commission after Ferdinand Springer. In 1714-1732, the house was in the hands of the lathe-worker Jan Steiner (*AMP 2274*, fol. 23;

3769, fol. 43). In 1778-1795, the master lathe-workers Jan and František Podušanský worked here (*SÚA TK 146*, N. C. 482). In 1795 the house was bought by Jan Sedaller, a master cutler (*Schaller 1797*, 328).

House no. 742 (Bellmann bell foundry, 1809-1884)

The foundry was established by Karel Bellmann Sr., who in 1810 married Anna Kühnerová, the daughter of the by that time deceased New Town bell-founder Václav Kühner, who worked in the neighbouring house, no. 740. Parish records from the Church of Our Lady of the Snow indicate that from 1813 K. Bellmann's residence was house no. 742-II on Široká Street. That house then became the centre of a great merging of the houses under the baton of Bellman family, which culminated in the 1840s. The building department of Prague Town Hall documents Karel Bellmann at that time as the owner of four building addresses – houses nos. 743, 742, 741, and 740. Bellmann purchased the Kühnerovský house no. 740 in 1832 and not longer after that evidently acquired house no. 741, formerly the seat of the Baroque bell foundry of Zachariáš Dittrich. In 1857-1869, the foundry was headed by Karel Bellmann, Jr., and in 1869-1884 by his sister Anna Bellmannnová (*AMP IV 1413/1896*; *D1 1676 per 1840-1844*; *Adressen-Buch 1847*; *Adressen-Buch 1875*; *Adressen-Buch 1878*). Bellmann's foundry is the last example of a bell foundry in Prague that maintained traditional foundry techniques that consciously drew on local tradition and specialized largely in recasting older bells.

House no. 740 (bell foundry of Zachariáš Dittrich and his sons, 1716-1764; bell foundry of Jan Václav Kühner, 1781-1801)

The most important New Town bell foundry in the Baroque period, which consciously revived and drew on the famous bell founding tradition of the Renaissance period on Široká Street.

Zachariáš Dittrich is recorded in the visitation tables of the Teresian Land Register as the owner of the house in the first quarter of the 18th century (*SÚA TK 142*).

Around the middle of the century, his sons Zachariáš, Jan, and Vít worked in the house, identified in the land register as "Ditrichische Erben" (*SÚA TK 146*, entry from 1757). Of the three bothers, the bell-founder Vít worked the longest in the house, and examples of his work are known from as late as 1764 (*Rybička 1885*, 84). The Teresian Land Register later recorded, following Dittrich's heirs, the presence of the bell-founder Jan Kühner in the same house (*SÚA TK 146*, entry from 1781).

Jan Václav Kühner came from an old family of bell-founders. His workshop in this house was probably the connecting link between the Baroque workshop of the Dittrichs in the second half of the 18th century and the Bellmann foundry in the first half of the 19th century. Evidence of this is an entry in the Teresian Land Register in 1781, where following the heirs of the Dittrich family, mention is made of "Johann Kühner" (*SÚA TK 146*, N.C. 486). After Kühner's death, the trade was run for a while by his widow, Anna Marie Kühnerová, and in 1810 the workshop was taken over by her son-in-law Karel Bellmann, who was married to Kühnerová's daughter Anna (*Šittler, b. d.*). The workshop of Václav Kühner continued in bell founding tradition and forms the direct link between the Baroque Dittrich workshop and the Bellmann house (the Bellmann's foundry was in house no. 742).

House no. 739 (the workshop of Mikuláš Zvonař from Žebrák, second half of the 15th century; the workshop of Jakub the boilermaker and bell founder, from 1484)

According to as yet unconfirmed information provided by earlier researchers, this is also a house with a bell founding tradition stretching back to the 15th century.

According to earlier literature, in the second half of the 15th century the workshop of Mikuláš Zvonař of Žebrák was located in the house on the corner of Široká and Pasířská Streets.

After marrying Zvonař's widow, Jakub the boilermaker – a friend and contemporary of Bartoloměj Berounský of house no. 747 – acquired the house in 1484 (*Rybička 1885*, 483).

An archaeological rescue excavation conducted in the courtyard of house no. 745-II (historically houses nos. 744 and 742-II), raised the need for a deeper archive studies, which had not yet been carried out on these New Town houses. This study, which was led primarily with reference to actual finds (remains of an Early Modern bell foundry on the excavated site), provided some fundamental new information. Above all, it facilitated the precise localisation of the bell foundry of Brikcí of Cinperk from the second half of the 16th century and the metal foundry of the Bellmann family from the 19th century (*fig. 1*). The discussion surrounding the location of the Bellmann foundry, which had been unclear since the time of the earliest researchers studying Czech bell founding at the start of the 20th century, was finally put to rest (cf. *Guth 1918*, 12; *Podlaha 1925*, 523; *Kybalová 1958*). The high point in the activities of the workshop on this excavated site was identified by both the archaeological excavation and archive records as the 1820s-1830s, when the foundry was headed by its founder Karel Bellmann, Sr. An interesting hypothesis that was subsequently verified was that the bell founding carried out on Jungmann Street in the courtyard lots near the Franciscan monastery had existed with uninterrupted continuity from the 15th to the 19th century (with the exception of the period after the Battle of White Mountain). A guideline and connecting link between the earlier and later periods was provided by the Teresian Land Register, specifically by its fiscal roaster of 1724, documenting the trades practised in each of the houses. Direct evidence was provided of the work of the bell-founder Zachariáš Dittrich in the house later given the number 740-II, in which a revisitation in 1781 documented another bell-founder, Jan Václav Kühner (*SÚA TK 142*; *TK 145*; *TK 146*). It was into Kühner's family that Karel Bellmann, Sr., after arriving in Prague, married at the very start of the 19th century (*AMP IV 1413/1896*; *D1 1676 per 1840-1844*). When he was looking for a location where he could establish his bell foundry, he did not just choose a location with a famous tradition, but one where that tradition was still alive. As a spatial reconstruction shows, Bellmann's foundry was located in the immediate vicinity of the assumed workshop of Brikcí of Cinperk. However, the renewal of the tradition of Czech bell founding on Široká (Jungmann) Street, associated with the names of Bartoloměj Berounský and Brickí of Cinperk, must be set not at the start of the 19th century as previously assumed, but rather deeper into the past – to the period of the Baroque (the workshop of Zachariáš Dittrich and his sons).

In the second half of the 16th century at the latest, it must be assumed also that special arrangements were made for the courtyard lots by the monastery wall of the Franciscan garden, where the metal foundry production was concentrated.

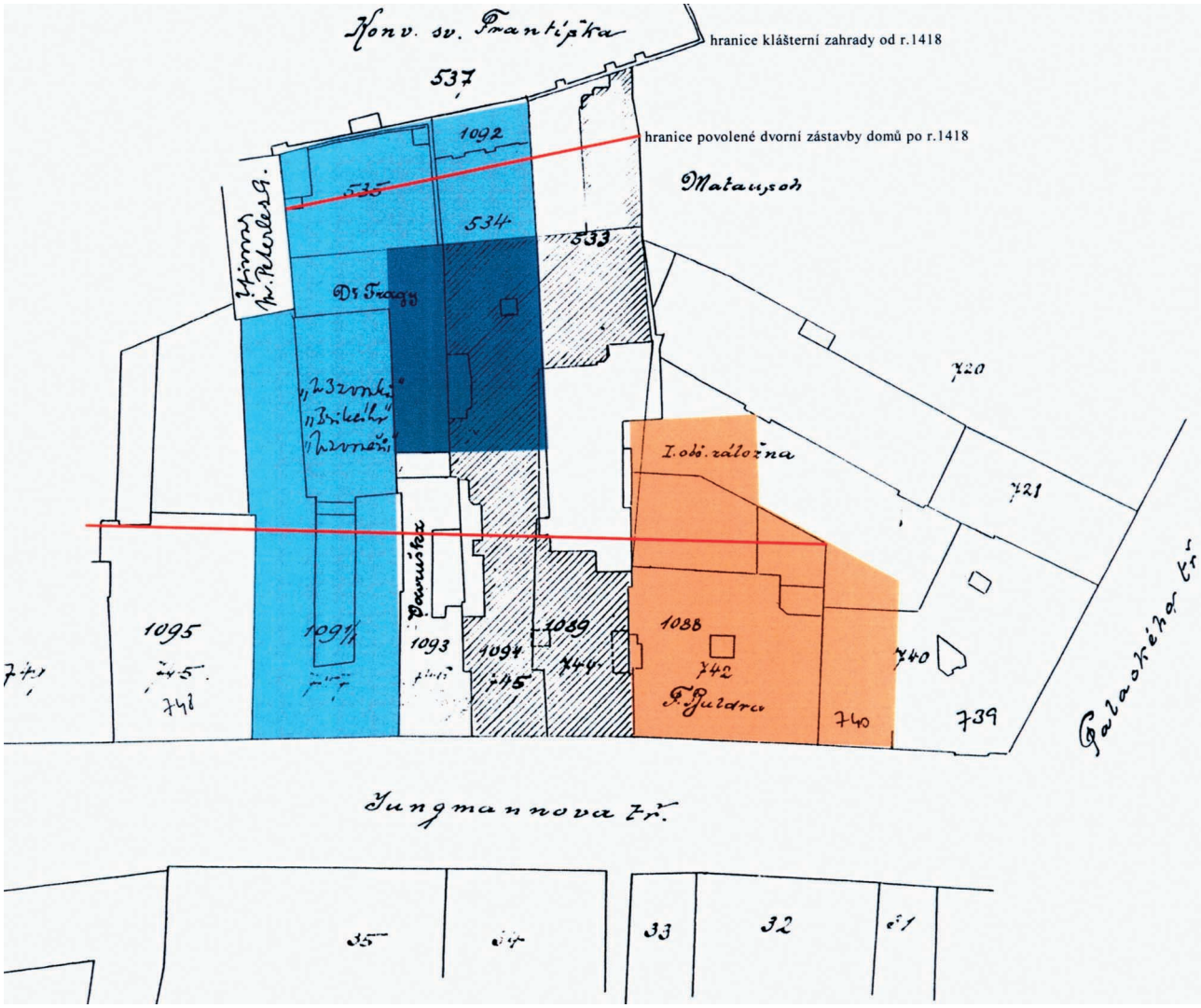

Fig. 1. Localisation of the foundry of Brikcí of Cinperk and the Bellmann foundry. Blue – maximum size of the Zvonařovský house (1571-1599); dark blue – probable location of Brikcí's foundry within the Zvonařovský house (16th century.); ochre – Bellmann's houses and bell foundry (19th century); the red line demarcates the production area on respective lots.
Obr. 1. Lokalizace dílen Brikcího z Cinperka a bellmannovské. Modrá – maximální rozsah Zvonařovského domu (1571-1599); tmavě modrá – pravděpodobné místo Brikcího dílny v rámci Zvonařovského domu (16. stol.); okrová – bellmannovské domy se zvonařskou dílnou (19. stol.); červená linka vymezuje výrobní prostor na příslušných parcelách.

The courtyards by the houses were soon integrated and consolidated as workshop bases and their borders did not exactly match the lot boundaries of the built-up area along the street.

Systematic archive studies also confirmed some other facts, for example, that in the 17th century Široká Street was much sought after and prestigious locality with a high market prices. In addition to the waning tradition of boiler-making foundries and bell foundries, the location was also popular among wealthy burghers and nobility at that time. Among the well-known figures who resided here was, for example, the Court architect Bonifác Wohlmut, or among politically active figures Tobiáš Štefek of Koloděje, who was among the Czech nobility executed in 1621 on the Old Town Square; the same fate befell his former neighbour from the Zvonařovský house, the son-in-law of Brikcí of Cinperk and a New Town councillor, Ondřej Kocour of Votín. After 1622, the New Town councillor and burgomaster Andreas Gatti, a former imperial courtier, also lived in one of the excavated houses (*AMP 2194*, fol. 7; *2202*, fol. 51; *2210*, fol. 98). Throughout the 17th century, the buildings on Široká Street were much sought after by buyers, which is evident from the substantial number of market contracts and from the market prices of the property, which ranged well above the average for property in the New Town.

Results of the archaeological excavation – the field context

A rescue excavation conducted in 2001 and 2002 by Archaia company on a large lot on Jungmann Street no. 24 (descriptive nos. 744 and 745) in Prague 1, provided a considerable amount of information about the as yet unknown field contexts in the area under observation. Together with the study of archive sources and historical building research on preserved masonry structures, a good picture was obtained of the historical development of the lot in the vicinity of what is today the Franciscan garden (*Juřina 2004*).

Test trenching already conducted by researchers from the Prague Heritage Institute (now the National Institute of the Care of Monuments, the territorial specialized department in Prague) suggested that the lot under observation was one with preserved archaeological terrains reflecting the diverse development of the rear of the house built in its original form over the course of the second half of the 14th century (*Tryml 1999*). It was therefore justified to assume that an excavation covering the whole vacant parts of the lot would make it possible to trace all the significant functional changes that left their mark on the appearance of the lot in the immediate vicinity of the monastery garden. The conditions of the built-up area today, however, made it necessary to divide the excavation into two spatially separate units, where we were forced (owing to the impossibility of connecting the unearthed stratigraphies) to evaluate the archaeological contexts separately (section A and section B).

Sector A is formed by the rear (eastern) courtyard with the large original garden house. Its core may have dated from around the year 1600, but the substantial reconstruction work carried out by František Buldra in the 1890s significantly altered it from its original appearance. All the earlier stratigraphic settlement layers were liquidated during the reconstruction works and only the lower part of the structures excavated into the sand-and-gravel subsoil remained available for evaluation. This generally involved pits not too large in size and with an irregular layout, containing a minimum amount of datable material. Paradoxically, the best-preserved find (a complete ceramic vessel) came from the space of a trench connected with a previous test trenching (*Tryml 1999*). The origin of most of the pits discovered can be dated to the course of the 15th century. In the western neighbourhood of the above-mentioned garden house just two mutually infringing structures – torsi of Early Modern sandpits from the 17th and 18th centuries – were excavated. In the fill of the later of the two, the excavation unearthed the filled cellar structure, with the part of the barrel vault intact.

Sector B, in its current appearance, is a large cellarless quadrangle bordered by the original street wing of the historical building and by the two wings of the above-mentioned extension built by František Buldra at the end of the 19th century. Work on this part of the excavated area, owing to the building's operational functions and the need to ensure the stability of the outside walls, was divided into the following two stages.

In the first stage, we had an opportunity to investigate the entire area of the spatially most significant parts of the excavated grounds. Here, beneath the surface of the recent courtyard and the bed beneath, two basic types of archaeological contexts were unearthed. The first was a fragments of technical equipments (brick gutters, cesspits, etc.), revealing an initially unidentifiable type of production work in the space of courtyard in the recent past (19th century). The second type of structures were the foundations of the masonry

structures, representing the original buildings located in the existing courtyard and removed in connection with the radical reconstruction of the lot at the end of the 19th century.

The second (much smaller) area, excavated in the second stage, was until recently the main communication route within the lot space, connecting the street wing to the yard in the neighbouring monastery garden. Within just this limited area the excavation succeeded in uncovering an intact medieval formation[1)] which, in the adjacent areas, was removed in connection with more recent settlement activities.

The most important discovery during the whole excavation was made at almost the very centre of the excavated site. The excavated structure, with a diameter of almost 5 metres, took up the entire area of trench no. 10, marked out in the southwest part of sector A, one metre south of the axis of trench no. 9. During the excavation, it was identified as a unique casting pit for repeated bell casting. Gradually, five stratigraphic layers of bell casting, that is the remains of the structures used for casting, were uncovered here. The levels were numbered while they were being unearthed. The casting pit, originally of an elliptic shape, reached a depth of almost two metres. By excavating each individual horizontal level, it was discovered that the casting area was in some stages of its use also divided vertically into three technological sections, so that it was possible to prepare a mould and cast a bell at the same time. This hypothesis was confirmed by the remains of wood and post-holes from the casing at the centre of the casting pit. The excavation recorded a sand-gravel subsoil (context no. 1006)[2)] at the bottom of the pit at a hight of 193.40 metres above sea level, and on its surface it unearthed the oldest and also the largest structure (remains of the foundation parts of the mould) for casting the bell, comprised of several parts (context nos. 10054, 10055, 10056, 10057, 10058). Tightly pressed against it was the next, fourth, level of the remains of the casting mould (context nos. 10039, 10040, 10041), at the centre of which a fragment of a burnt wooden stake was unearthed (context no. 10045). This mould, located in the southern part of the trench, was separated from the remaining parts of the casting pit by wooden casing, the remains of which were discovered in the shape of a channel (context nos. 10044 and 10043) and a post-hole (context no. 10208). The remains of the mould (context nos. 10054-10058) were covered with a yellow-brown, red-streaked encrustation (context no. 10034), which was simultaneous with the encrustation (context no. 10023) found in the northern part of the trench. Both of these layers belonged to the upper remains of the fourth level. The encrustation (context no. 10023) was the only piece of the remains of the casting mould at this level. The third technological level was represented by another loam layer (context no. 10014), found in the western part of the trench, one-third of which extended into the western wall of the trench. This part was also separated from the remaining space of the casting pit by wooden casing, a remnant of which (context no. 10013), in the form of rotten wood (a wooden board), passed around the encrustation at a 136-degree angle toward the centre of the entire excavated structure. Pressed against the fourth level of the two remains of moulds for casting bells was the second level, which also contained two remains from casting moulds, roughly equal in size and with the same position in the casting pit. This level also had two parts – an older piece of remains from firing the so-called core of the bell (context nos. 10024, 10025, 10009, 10008) and a later encrustation

Note 1:
One of the important finds is a collection of coins, which helped us to precisely date the ceramic material that was found and the respective layers. A small collection of currency from the 1390s helped identifying an unremarkable formation in the area of the main communication route with the oldest settlement horizon of the New Town building development at this location. That development was directly connected with the first stage of selling off parts of the monastery garden. All of the finds were common small coins of domestic and foreign origin (*Militký 2004*).

Note 2:
The numbers in the brackets refer to particular contexts.

dating from a period after the moulds were out of use (context nos. 10005 and 10004). The most recent, the first, level turned up the smallest piece of remains of a mould for casting bells (context no. 10003), also with the same kind of wooden casing (context no. 10010) as that found at the third level. It is likely that levels 1, 2 and 3, 4 may have functioned simultaneously.

During the field works it was not possible to identify a structure that could have been the melting furnace, which must have been used in the immediate vicinity of the casting pit. There may be two reasons for this fact. Either this piece of technical equipment was located in the vicinity to the west on a lot not excavated by us, or its foundations were removed during later adaptations of the courtyard. A comparison with the situation in bell foundries today, where casting pits are found relatively deeply beneath the level of the melting furnace, would suggest the latter.

Bell-founding technology

The remains of the casting pit unearthed during the rescue excavation on lot no. 24 (descriptive nos. 744 and 745) on Jungmann Street prompts a question about the technology used in bell founding: what process did the casting of large bell moulds take, and what remains after the destruction of the moulds from cast bells? Finds of relevant melting structures or structures used for casting bells, so-called casting pits, are relatively rare. Without the cast structures (remains of bells) to accompany the melting structures, it is difficult to interpret the latter. Nevertheless, even far back in Europe of the Middle Ages, it is assumed there was knowledge of so-called hearth furnaces, the use of which facilitated continuous casting and with it a perfect homogeneity of large castings (*Nováček 2002*).

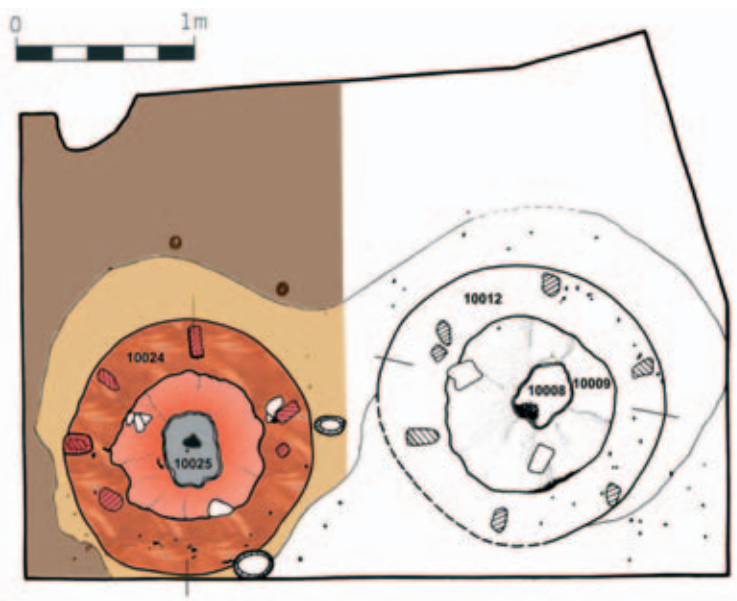

Fig. 2. Prague 1, Jungmann Street no. 747. Remains of two bell moulds in the third unearthed level of the casting pit. *Drawing by K. Kašák.*
Obr. 2. Praha 1, Jungmannova ul. č. p. 747. Relikt dvou zvonových forem ve třetí odkryté úrovni licí jámy. *Kresba K. Kašák.*

The find of a casting pit at Jungmann Street no. 745, ascribed to the bell foundry run by the Bellmann family, belongs in terms of the extent of the remains (approx. 70 % of the pit was preserved) to the better preserved finds and, given that the remains of several moulds in the pit are easily visible, also to the more easily interpreted finds (*figs. 2, 3*). The melting equipment, that is, the hearth furnace, was not found during the excavation, even though it is more than likely that it would have been situated somewhere close to the casting pit. As it was possible to unearth almost the full depth of the casting pit beneath the recent layer, it may be that the melting furnace, which must have been located above the upper edge of the casting pit, was destroyed during the reconstruction work done on the house by F. Buldra in the 1890s.

A description of the work procedure in the production of bells can be found in the text by Vavřinec Křička of Bítýška, written before 1570. The basic principles and methods described by Křička – with the exception of the use of modern lifting devices or computer technology for precisely calculating the shape of the bell rib – do not differ much from the techniques used in foundries today (see the reconstruction of the casting of medieval bells

for the Church of St. Mary Major in Exeter (Devonshire) in southwest England (*fig. 4*). Consequently, it was possible not just to identify the remains of the casting moulds in the pit but also to partially reconstruct the work procedure used in casting bells in the Bellmann foundry.

Casting pits were sometimes built for single use, in the case where the bell was being cast on the site of, or close to, the place where it was to be raised. This possibility was used mainly for casting large bells, which were difficult to transport. In such cases, the casting pits were usually dug out in the ground with just simple wall reinforcements and, if the ground was suitable, then sometimes without reinforcements.

Casting pits were also built for repeated use, especially in the Late Middle Ages and Early Modern periods, and they were carefully walled and fitted with a solid floor to make them easy to clean and harder to destroy. These pits were built in metal-casting workshops which, in the Czech lands, flourished mostly in the 16th century, during the lifetime of Vavřinec Křička of Bítýška. This kettle-maker and author of the text "On Casting and Preparing Cannons, Bullets, Mortars, Bells, Kettles for Drawing Water, for Fountains, etc., with Many Illustrations", happened to reside in house no. 746, adjacent to the bell foundry of Brikcí Zvonař of Cynperk (no. 747). At the start of the 19th century, it was in this house that Karel Bellmann revived the bell-making tradition.

The basic, and the most delicate, task of the bell-founder, and the most important task for ensuring acoustic precision, is creating the proper shape of the bell rib (profile of a bell), which should be of such shape that the finished bell achieves an accuracy of within one-eighth of the desired tone which, in an ascending harmonic series, contains all the partial tones. The widest part

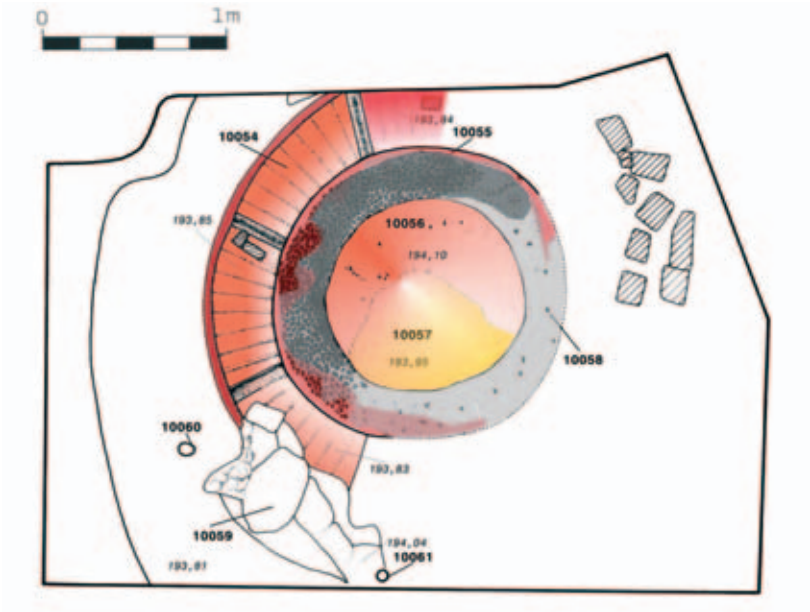

Fig. 3. Prague 1, Jungmann Street no. 747. Remains of the bell mould of the largest bell in the fifth level at the bottom of the casting pit. *Drawing by K. Kašák.*
Obr. 3. Praha 1, Jungmannova ul. č. p. 747. Relikt zvonové formy největšího zvonu v páté úrovni na dně licí jámy. *Kresba K. Kašák.*

Fig. 4. Exeter, St. Mary Major. Reconstruction of the work techniques involved in casting bells. Top, from left: shaping the core on a bench; shaping the false bell; lowering the finished mould into the pit. Bottom, from right: drying the mould and melting the wax relief work; casting. Reproduced from a book by *S. R. Blaylock* (*1996*).
Obr. 4. Exeter, St Mary Major. Rekonstrukce pracovních postupů při odlévání zvonů. V horní části zleva: formování jádra na stolici; formování falešného zvonu; spouštění kompletní formy do jámy. Ve spodní části zprava: vysoušení formy a tavení voskových reliéfů; lití. Reprodukováno z knihy *S. R. Blaylocka* (*1996*).

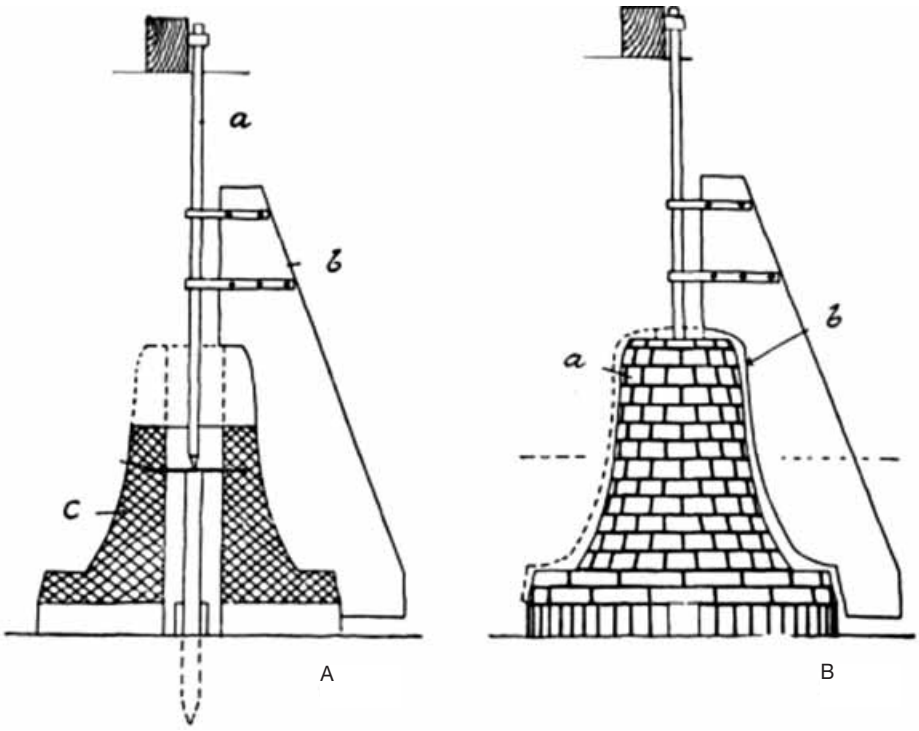

Fig. 5. A – core of the bell walled according to the shape of the strickle: a – iron spindle; b – wooden strickle; c – bricked core. B – finished core, shaped and smoothed to match the strickle: a – bricked core; b – hole for putting on the coat of clay. Reproduced from a book by *L. Kybalová* (*1959*, 27).
Obr. 5. A – jádro zvonu vyzděné podle šablony: a – železná hřídel; b – dřevěná šablona; c – vyzděné jádro. B – hotové jádro, vykroužené a uhlazené podle šablony: a – vyzděné jádro; b – výřez pro nános hlíny. Reprodukováno z knihy *L. Kybalové* (*1959*, 27).

on the rib, the sound bow, is a kind of measure of the proportions in the shape of the bell rib. Most important is the relationship between the size of the rib and the height and thickness of the sound bow in its diameter. Just as important are the proportions between the largest and smallest diameters of the bell. The rib is shaped according to precisely set calculations: the upper part should at the cross section be half as thick as the sound bow, the lip should sharply narrow into the shape of the letter "V" (*Kybalová 1958*, 22).

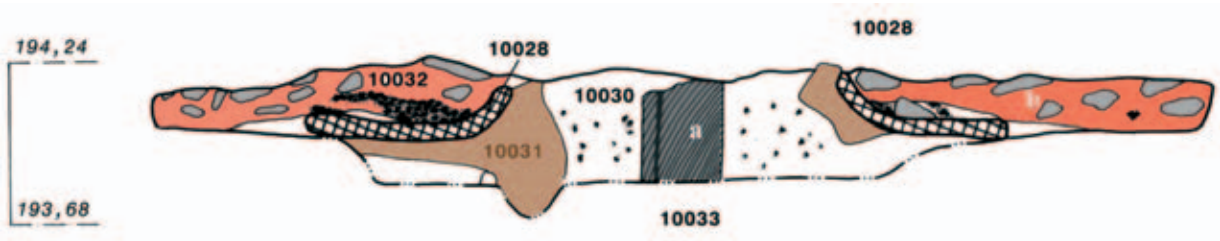

Fig. 6. Prague 1, Jungmann Street no. 747. Section through a piece of remains of the bell mould for the largest bell at the bottom of the casting pit. a – carbonised wood (spindle); b – clay encrustation. *Drawing by K. Kašák.*
Obr. 6. Praha 1, Jungmannova ul. č. p. 747. Řez reliktem zvonové formy největšího zvonu na dně licí jámy. a – zuhelnatělé dřevo (hřídel); b – mazanicová krusta. *Kresba K. Kašák.*

The process of casting bells itself has changed little since Křička's days. The base of the bell structure is a vertical spindle sunk into the ground (see *fig. 5*). In the casting pit uncovered on Jungmann Street, the remains of such spindles were usually found in the form of carbonised wood, located at the centre of a furnace used to slowly dry the individual layers of the mould. This was probably the part of the spindle that passed through a drying channel (*fig. 6*). A wooden strickle was hung on this spindle with several scale lines prepared in advance to help create the particular shapes of mould and ultimately the shape of the bell itself (*fig. 5*). The strickle was made from dry pear or maple wood. The brick base for the construction of the so-called core was then built. This base is used repeatedly today, given that it tends not to be damaged after casting. The core, which has then been bricked onto the brick foundation and the future appearance and shape of the bell has in rough contours been thus determined, is hollow inside and has several holes for ventilation during casting process. The channels inside the base help to dry the individual layers of clay coated on the core in order to create the shape of the clay model of the bell (so-called false

bell). These layers, created out of clay, neither too pasty nor too sandy, mixed with cow or horse manure, animal (usually calf) fur, flax fibres, and graphite then form the future inner profile of the bell. The final layer must be fine in order to create a precise and smooth surface and shape that matches the shape of the first, rotating strickle (*Kybalová 1958*, 27).

While the core dries slowly and properly, it is coated with a mixture of fine ash and water and then sometimes tallow. This creates a kind of expansion layer for separating the future false bell from the core.

Manufacturing the false bell is the most important part in the process, as the false bell is what determines the exact appearance and therefore also the quality of the future bell (*fig. 7: A*). It is made with a new strickle, this time one that takes the shape of a bell surface. The false bell is made by gradually coating on layers of clay; the first one (according to Křička, around 5 cm thick) dries in the air, the other layers then dry with the help of a fire. The surface of the finished false bell is again covered with tarrow or with paraffin mixed with beeswax. The finished bell after casting will be an exact copy of the false bell, so any decorations or inscriptions that are to be included on the finished bell must be prepared during this phase. This relief work and inscriptions are made of wax and are stuck onto the surface of the false bell. After the final layer of clay, so-called cope, has been added, these figures and inscriptions slowly soften and melt away as it dries. So an impression emerges in the cope that will be filled by the bell metal during casting.

The cope is the third and final layer of the mould. Strickles are not required to make it. The first layers are of fine burnt clay mixed with brick powder, graphite, sometimes animal fur with a bit of beer or molasses (*Kybalová 1958*, 29). The mixture is spread on the surface of the false bell with a brush to ensure that all the details of the decorations are captured. The remainder of the cope is covered in thicker layers and using a solid clay mixed with fur and hemp. The mould for the crown of the bill is also made of wax, which is wrapped in clay; then an inlet is made and its exhaust is sunk into the prepared opening at the top of the cope. In order for the casting to be successful, it is necessary to ensure that the cope reaches deeper than the false bell and that it fits tightly up against the walled base. The cope is braced up on the surface with longitudinal and transversal iron belts and hinges (*fig. 7: B*). After the individual parts of the mould have dried, the cope is raised; this reveals the false bell, which is carefully broken and removed. The heating appliance inside the form is put out of action and therefore it is possible to brick up the individual holes. The cope is again lowered on the core, in the very same position from which it was removed. Any fissures that emerge, mainly in places of contact between the cope and the base, are coated with a mixture of clay and sand to prevent the bell metal from flowing out. The entire mould is lowered with iron belts into the prepared casting pit located close to the melting furnace. In the case of large bell moulds, it was also possible to build the mould right in the casting pit. The contexts unearthed during the excavation on Jungmann Street do not confirm this; an exception is the largest bell located on the bottom of the casting pit that was evidently built just for it.

The base structure of the bell core was the best preserved part of the remains from the destruction of this bell mould. At the centre of the base there were – unlike in the case of other destroyed moulds – clearly evident traces of the presence of a furnace, which indicates that this mould was built directly at the bottom of the casting pit. Also, the size of the base – in comparison with the likely size of the casting pit –suggests that working space for building the mould was taken into account in the construction of the pit for casting this

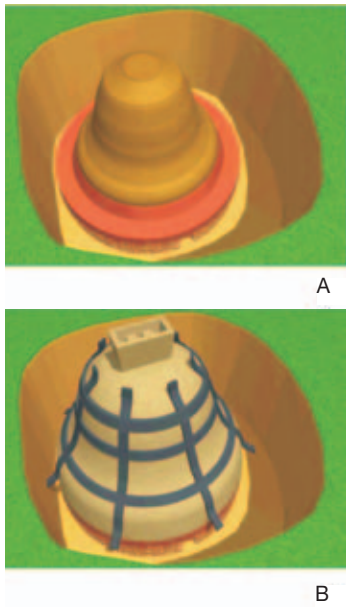

Fig. 7. Prague 1, Jungmann Street no. 747. Reconstruction of the casting pit and the largest bell mould cast in it. A – a false bell; B – cope of the bell mould with bracing.
Drawing by F. Zemek.
Obr. 7. Praha 1, Jungmannova ul. č. p. 747. Rekonstrukce licí jámy a největší zvonové formy v ní odlité. A – tzv. falešný zvon; B – plášť zvonové formy s vyztužením. *Kresba F. Zemek.*

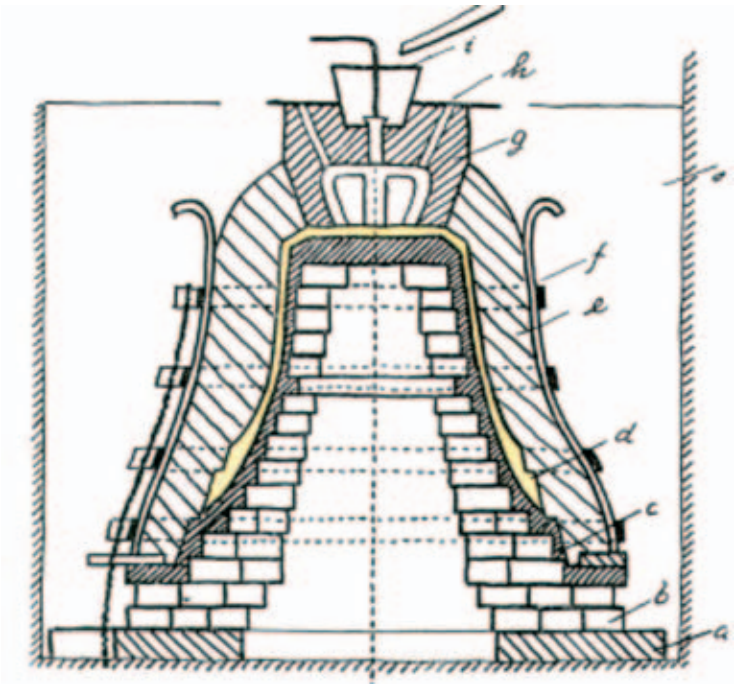

Fig. 8. Section through the bell mould: a – base; b – bricked core; c – clay layer of the core; d – a false bell; e – cope; f – metal belts; g – mould for the crown; h – exhaust; i – groove for the inflow of metal; j – casting pit. Reproduced from a book by *L. Kybalová* (*1959*, 31).
Obr. 8. Řez zvonovou formou: a – základ; b – vyzděné jádro; c – hliněná vrstva jádra; d – falešný zvon; e – plášť f – kovové pásy; g – forma pro korunu; h – výfuk pro odvod vzduchu; i – žlábek pro přítok kovu; j – licí jáma. Reprodukováno z knihy *L. Kybalové* (*1959*, 31).

bell. An analogical situation, the only difference being that three bells were cast at the same time, was unearthed in an excavation on Cowick Street in Exeter *(Blaylock 1996*, 76, fig. 5). Other, smaller, moulds, the remains of which were unearthed in the pit, were usually tightly encased so that another mould could be prepared while the process of casting was taking place. This confirms the hypothesis that it was necessary to save space in Karel Bellmann's foundry and the pit was therefore used repeatedly.

Moulds that for reasons of size did not have to be prepared at the casting site, directly in the pit, were moulded on benches. Particular layers were dried, again with the aid of charcoal, while the mould was fixed to a horizontal spindle that slowly rotated. Before casting, the mould in the pit was backfilled with clay so that the pressure of the metal during casting would not raise the cope from the core. A brick channel was made from the prepared tapping point to the top of the mould. The bell metal was melted in a hearth furnace.

The bell metal was made with copper and tin. These raw materials had to be melted down at a temperature of around 1200° C and then mixed in the right proportions to create a homogeneous mass. The proportional amounts of these basic materials often varied, not just over time, but also between individual foundries. The exact composition of the bell metal was a well-kept secret of every foundry, and the ratio of copper to tin also to some extent had an effect of the sound of the individual bell.

The floor of the melting chambers in the furnaces had to be not flat, but slightly inclined so that the alloy could flow to the tapping holes. The temperature of the bell metal during casting was 1100° C; at higher temperatures the volume of an easily melted tin might be reduced. Before pouring the metal, the brick channel had to be heated with charcoal to prevent a rapid change in temperature which could lead to damaging the channel or cooling the hot metal. The furnace was usually located in a place from which it could be tended the best, which meant on ground level. This was one of the reasons that the casting pit was dug below this level. By being excavated into the ground it was also easy to backfill, and the clay served as a key material for sealing and, at the same time, for slowly cooling the cast bell. After casting, the bells cool down for up to several days, depending on their size. It was therefore necessary that bells roughly equal in size were cast simultaneously in one pit, so that they could also be removed simultaneously from the pit after cooling down.

After the cope was raised the bell was set down, the core broken up, and the clay and bricks removed. In the case of repeatedly used pits, only the intact base of the bell core remained. Only the impression from the mould remained on the base. In the case of the casting pit unearthed in the excavation on Jungmann Street, even the base was partly taken apart. Once the remains of the core were removed, the bottom of the pit was cleaned up and the pit and the base were then used to build another mould. This procedure was based on the assumption that other bells cast in the same pit would not be as large as

Fig. 9. Prague 1, Jungmann Street no. 747. Layout of sector A of the excavation, the casting pit and the assumed edge of that pit marked with a red arrow. *Drawing by K. Kašák.*
Obr. 9. Praha 1, Jungamnnova ul. č. p. 747. Půdorysný plán plochy A výzkumu s vyznačenou licí jámou a její předpokládanou hranou (červená šipka). *Kresba K. Kašák.*

the previous bell. How many such pits were located at the foundry of Karel Bellmann and his successors cannot be estimated. Owing to requisition introduced during the First World War, the exact number of bells cast at this foundry is today unknown. At least six bells were cast in the unearthed pit at house no. 747. Given that three generations of the Bellmann family worked at the same location, it is certain that many more bells than that were cast in this foundry.

In conclusion, it can be said that the majority of the finds of bell foundries published in Central and Western European literature were sites built for just single use. These were sites located close to the place where the bell was to be raised, like the casting pit dating to the Middle Ages dug into the deserted casing of the castle tower unearthed in an excavation at the castle in Tábor (*Krajíc 2006*).

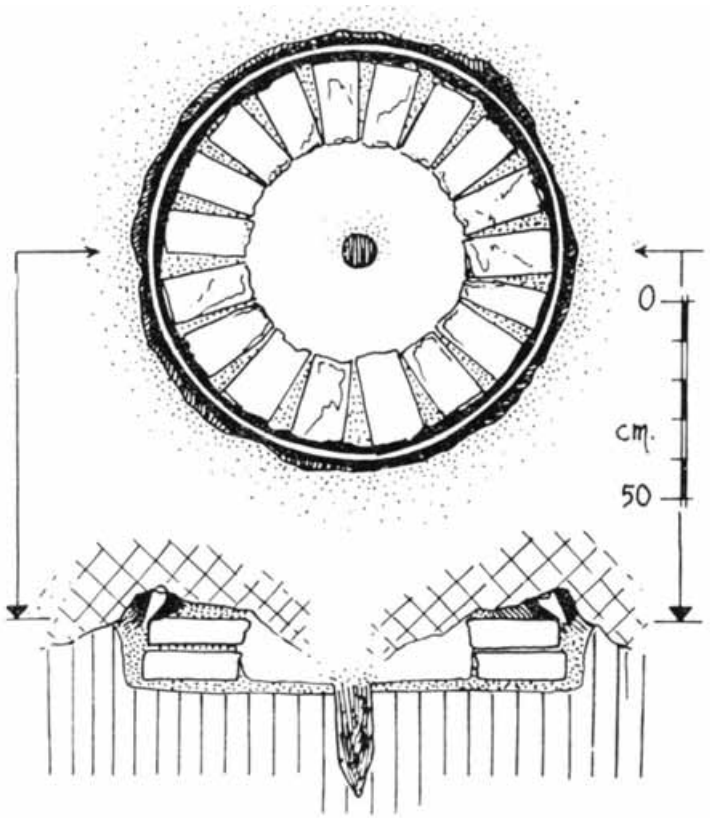

Fig. 10. Brussels, St-Martinuskerk te Genk. Layout and section through the remains of the base of the bell mould, with the remains of the carbonised spindle. Reproduced from a book by *J. Mertens* (*1957*).
Obr. 10. Brusel, St-Martinuskerk te Genk. Půdorys a řez reliktem základu zvonové formy s pozůstatkem zuhelnatělé hřídele. Reprodukováno z knihy *J. Mertense* (*1957*).

Evidence of continuous bell founding (bell foundries operating over an extended period) is not identified through archaeological methods – unlike in written records – very often. Nevertheless, termination horizons of casting pits excavated thus far are identical both in the case of single-use sites and in the case of long-running foundries.

Conclusion

The early stages of the built-up areas on the excavated lots are connected with the initial division of the large garden of the Franciscan convent at the Church of Our Lady of the Snow. This means that circa around 1380 boundaries were established between the houses and were respected almost up to the time of the radical reconstruction carried out on the lots by František Buldra after 1889. In the interim, changes to the lot territories occurred mainly in connection with the gradual sale of parts of the monastery garden up to its current border. This resulted in an enlargement of the production sphere at the rear of the built-up area along the street (*Poche 1980*, 150-166). This period is evident in archaeological contexts from the various mining structures (sandpits) dating from the 15th to the turn of the 17th and 18th century, when development on the rear parts of the lots became stable. Given the rich collection of finds, it is worth mentioning the fill of two cisterns dating from the course and end of the 16th century. These Early Modern cisterns were definitely part of the property owned by the famous bell-founder Brikcí. However, archive research found that the actual foundry of this master of the bell-founding trade was located outside the area of archaeological excavation. Identifying the location of this foundry nonetheless is one of the main findings of the archive studies that were required in the complex approach to the study of this site.

A major contribution of the excavation is, above all, the discovery of the casting pit from the Early Modern bell foundry of Karel Bellmann. At the start of the 19th century, he founded his successful trade on a long tradition of bell founding on then Široká (formerly Zvonařská) Street, stretching back to the legendary master of bell founding, Brikcí of Cinperk (before 1600). The character of the pit (an excavated, isolated structure) allowed us to thoroughly study this part of the production process of this old craft. In some horizons, it was possible to unearth the structural foundations of the bottom parts of bell moulds, which also allowed us to determine the dimensions of the bells that were actually cast at this site. The dating of this structure was confirmed by a coin from the time of the Emperor Franz I, found in the fill layers. An important contribution of the archaeological excavation as a whole was also the direct confrontation of the field contexts with the findings of a recently conducted archive studies and the definitive exact location of the Bellmann foundry. The archaeological excavation and the archive records both dated the high point in the foundry's activities to the 1820s-1830s, when it was headed by Karel Bellmann, Sr. (*Lunga 1996*, 7; *Scheufler 2001*, 14-17).

A

B

Fig. 11. Pasov, bell foundry of the Perner family.
A – bricked core of the bell mould with the moulding strickle;
B – the bell-casting process, where the melted bell metal flows along a brick channel into the bell mould in the casting pit.
Photo by P. Juřina.
Obr. 11. Pasov, zvonařská dílna rodiny Pernerů.
A – vyzděné jádro zvonové formy s formovací šablonou;
B – proces odlévání zvonu, kdy roztavená zvonovina protéká cihlovým kanálkem do zvonové formy zasypané v licí jámě.
Foto P. Juřina.

An interesting hypothesis that was eventually verified was that bell founding in the courtyards on Jungmann Street by the Carmelite and later Franciscan monastery was carried out with almost uninterrupted continuity from the 15th to the 19th century.

Based on the above facts, we can conclude that in the case of the excavated grounds of the future "Jungmann Plazza" Centre, we were able to excavate one of the few preserved cellarless lots in this part of the New Town. Despite the considerable interference in the terrain by sub-recent building activities, this was archaeologically an extremely important area in the Prague conurbation and one that is a very rich source of historical information. Subsequent analysis produced, and in the future will certainly continue to produce, important information contributing to the understanding of the issue of the development of settlement infrastructure in the rear sections of town lots in the High Middle Ages up to the 19th century. An exceptional contribution is also the discovery of unique technical equipment, which has shed new light on our knowledge of the development of one of the most significant applied arts in Prague.

Resumé:

Záchranný archeologický výzkum, vyvolaný záměrem výstavby business centra „Jungmannova Plazza" v Jungmannově ulici na Novém Městě v Praze a prováděný v letech 2002-2003, přinesl unikátní objev reliktu zvonařské licí jámy.

V důsledku výstaveb a rekonstrukcí probíhajících na celém území Nového Města zanikají původní, archeologicky cenné terénní situace. Podzemní garáže navrhované v objektech v této části Prahy kompletně devastují veškeré zbytky archeologických situací důležitého území sídelní aglomerace s velmi vysokou historickou vypovídací schopností. Jungmannova ulice (dříve Široká) byla již od konce 14. století významným centrem, kde se soustřeďovali řemeslníci zaměření převážně na zpracování kovů. Archeologickým výzkumem v domech č. p. 745 a 744 se podařilo prokázat poměrně zachovalé terénní situace. Vzhledem k postupné zástavbě území vymezeného ulicemi Jungmannova, Palackého a Vodičkova z jedné strany a františkánskou zahradou s kostelem Pany Marie Sněžné ze strany druhé byla

značná část parcely zasažena touto činností v podobě jam po těžení písku. Nejstarší archeologicky zjištěný horizont na parcele představoval období výstavby domu ve druhé polovině 14. století. Tyto terény byly však natolik ojedinělé a torzovité (dochované ostrůvky prakticky nevytvářely ucelenou situaci), že nebylo možné je kvalitním způsobem interpretovat. Jednalo se v podstatě většinou o objekty zahloubené do podloží a v jednom případě o relikt kamenného základového zdiva.

Největším přínosem archeologického výzkumu byl objev reliktu poměrně zachovalé zvonařské licí jámy. Při exkavaci zásypu této jámy se vedle nevelkého množství novověké keramiky, zbytků slitiny kovů (později určené jako zvonovina) a také jedné krejcarové mince císaře Františka I. podařilo odkrýt šest reliktů zvonových odlévacích forem. Tak bylo – s využitím souběžně zpracovávané historické rešerše dané lokality – možné přesně určit polohu zvonařské huti rodiny Bellmannů, která zde navázala na historickou zvonařskou tradici na počátku 19. století.

Původní parcelace rozsáhlé zahrady karmelitánského konventu při kostele P. Marie Sněžné (kolem roku 1380) jasně vymezovala rozsah Bellmannovské huti. Původní parcelní hranice byly respektovány prakticky až do radikální přestavby tohoto domovního bloku Františkem Buldrou po roce 1889. Archeologickým výzkumem se podařilo zachytit okrajovou část Bellmannovské dílny. Důkladná archivní rešerše navíc velice podrobným způsobem rozkryla polohu ostatních hutí významných mistrů tohoto uměleckého řemesla. Jednalo se o dílnu Brikcího z Cinperka (1550-1599, č. p. 747), konváře Vavřince Křičky z Bítýšky (1557-1566, č. p. 746), proslulého spisem o postupu při výrobě zvonů, nebo zvonaře Zachariáše Dittricha a jeho synů (1716-1764, č. p. 740). Působení těchto mistrů jasně dokládá kontinuitu zdejší zvonařské výroby.

Rozborem jednotlivých situací v odkryté licí jámě, jež byly konfrontovány s poznatky o technologii výroby zvonů, bylo potvrzeno, že se jedná právě o relikt zvonařské licí jámy. Ve výplni této jámy ani v jejím nejbližším okolí nebylo sice nalezeno větší množství odpadu po odlévací činnosti, tuto situaci ovšem vysvětluje fakt, že zvonovina jako materiál byla poměrně drahá, takže její případné zbytky se zvonaři pokoušeli opětovně upotřebit.

Z dosavadních zjištění je zřejmé, že technologie výroby zvonů neprošla během svého vývoje příliš velkými změnami. To dokládají různé analogie převážně z objevů učiněných v západní Evropě. Objevy pozůstatků po zvonařské činnosti jsou v evropské literatuře publikovány daleko častěji než u nás, což může vést k domněnce, že ne vždy jsou tyto relikty v terénu rozpoznány či náležitě interpretovány.

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Archaeological excavation of a Modern period brickworks on the Kimberly-Clark site in Jaroměř

Archeologický výzkum novověké cihelny v areálu Kimberly-Clark v Jaroměři

Die archäologische Grabung der neuzeitlichen Ziegelei im Areal Kimberly-Clark in Jaroměř

Radek Bláha – Jiří Sigl

Im Rahmen der Grabung im Areal der Firma Kimberly-Clark wurden im Jahr 2003 Aushübe für das Leitungsnetz verfolgt. Im Nordarm des Aushubs für eine Gasleitung wurden zwei 21 und 27 m lange Objekte mit regelmäßig verteilten Brandspuren dokumentiert, in deren Verfüllung sich Ziegelfragmente fanden. Beide Objekte können als Überreste einer ursprünglich größeren Ziegelei wahrscheinlich aus der zweiten Hälfte des 18. Jahrhunderts angesehen werden, die wahrscheinlich mit der örtlichen Festung Josefov zusammenhängt. Weitere Objekte kamen während der Grabungssaison 2004 zutage. Es handelt sich wahrscheinlich um regelmäßig verteilte Gruppen von Gräbchen und größere Lehmgruben. Diese Objekte können gleichfalls als Bestandteil einer technischen Einrichtung in Zusammenhang mit der Ziegelproduktion gesehen werden.

... where there is a huge brickworks.
The large, high kilns emitted black columns of smoke,
sometimes darkening the whole sky or covering Jaroměř.
... Red earth, red bricks, grey buildings, ragged folk,
dusty soldiers, clouds of black dust everywhere, the suffocating smoke
and above it, the burning sun...
(Albieri 1892, 42, translation: A. Millar)

Archaeological excavations[1)] took place at the Kimberly-Clark a. s. works have been ongoing since 2000, and stretch back to 1995 (*Vokolek 1996).* The investigated area lies on the western edge of Jaroměř, east of the Dolecký stream and south of the area known locally as "Cihelny", at an altitude of 263-267 m a. s. l. *(fig. 1).*

In addition to intensive settlement in prehistory, a Modern period archaeological situation was also investigated that can be linked to the local production of bricks (reports on the individual excavation seasons are available in *Bláha – Sigl 2004; 2005; Sigl – Vokolek 2001; Sigl 2002; 2003).*

Bricks (and other products) were made in this part of what is now Jaroměř from 1780 onwards, to supply the construction of the Ples fortress (now known as Josefov). The production is recalled not only by the still extant name for this part of Jaroměř ("Cihelny" translates literally as "Brickworks"), but also in the traces to be seen in cartographic sources of the 18th-20th century (particularly in the Ist, IInd and IIIrd military mappings), where they appear as regular depressions in the terrain running roughly west to east. It was indeed at the edge of conspicuous unevenness in the terrain that buildings associated with brick manufacture were identified during the 2000 and 2001 excavation seasons, and especially in 2003 and 2004 *(figs. 2, 3).*

Note 1:
Archaeological excavation was undertaken by the East Bohemian Museum in Hradec Králové; technical and documentary support was provided by the firm of Milan Čermák.

Fig. 2. Jaroměř, Kimberly-Clark works. Contour plan of the archaeological excavations of 1995 and 2000-2004, showing the areas investigated in 2003 and 2004 and the features described in the text.
Obr. 2. Jaroměř, areál Kimberly-Clark. Vrstevnicový plán archeologického výzkumu 1995, 2000-2004. Vyznačeny plochy výzkumů z let 2003 a 2004 s objekty popisovanými v textu.

Fig. 3. Jaroměř, Kimberly-Clark works. General plan of the archaeological excavations of 1995 and 2000-2004 and the features discovered, and indicating the areas investigated in 2003 and 2004 and the features described in the text. A – the location of the modern features investigated in 2003; B – features investigated in 2004.
Obr. 3. Jaroměř, areál Kimberly-Clark. Celkový plán archeologického výzkumu 1995, 2000-2004 s jednotlivými objekty. A – poloha novověkých objektů prozkoumaných v roce 2003; B – objekty zkoumané v roce 2004.

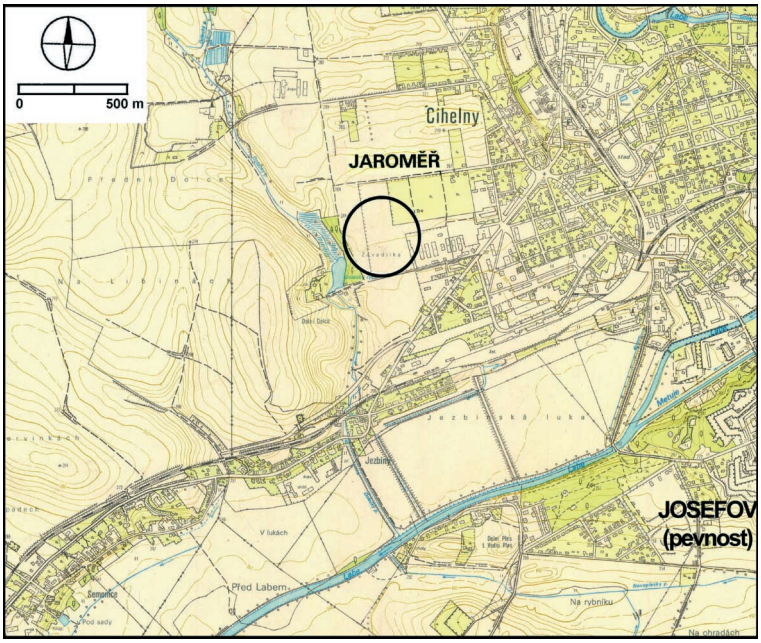
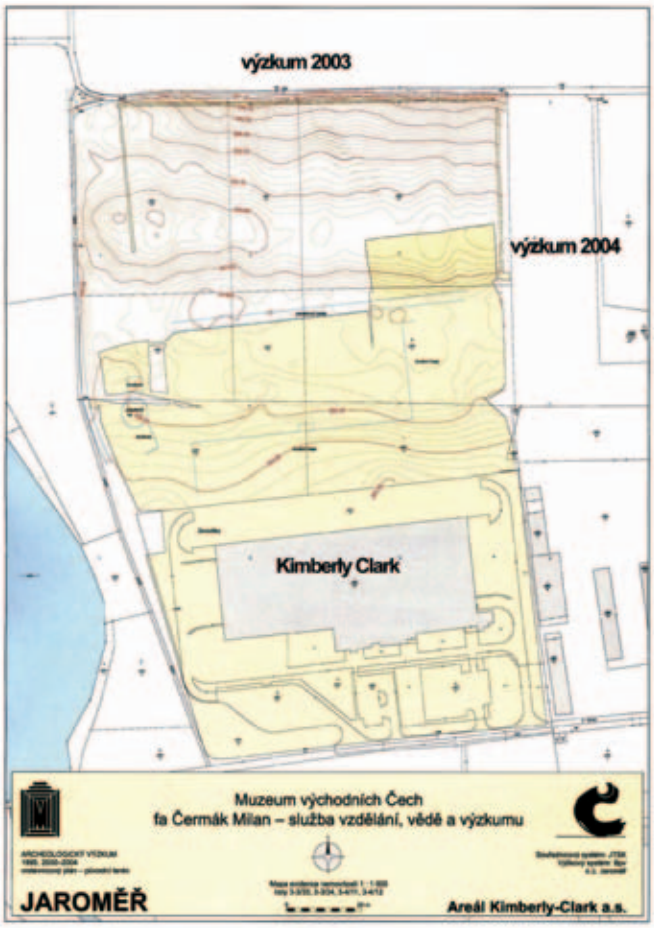


Fig. 1. Jaroměř. View of the south-western part of the town, showing the investigated area within the Kimberly-Clark works building site, the Cihelny quarter and the Josefov fortress.
Obr. 1. Jaroměř. Pohled na jihozápadní část města. Vyznačena zkoumaná plocha v rámci stavby závodu Kimberly-Clark, poloha čtvrti Cihelny a pevnosti Josefov.

2.



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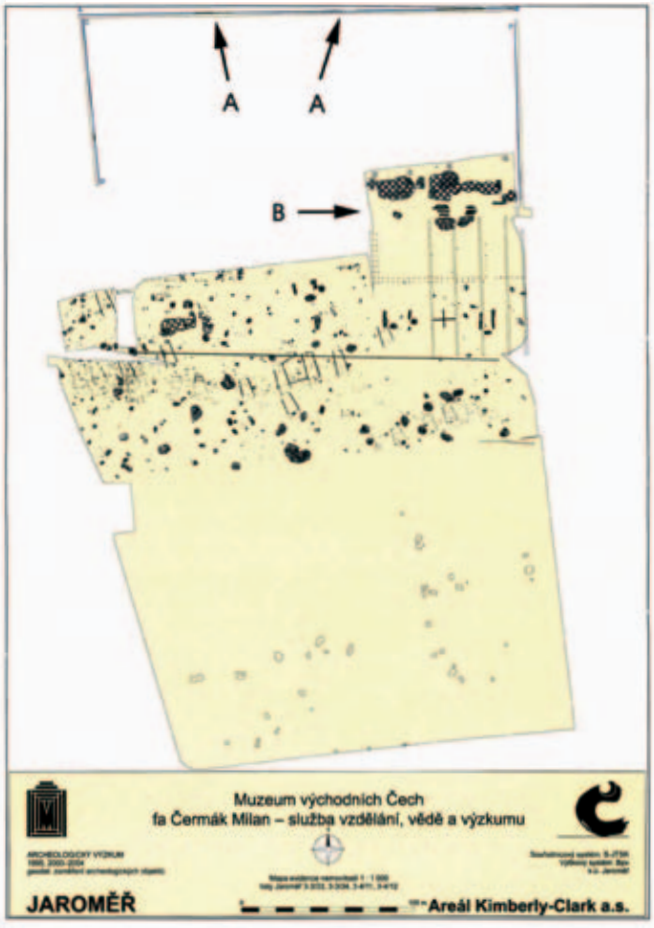


In 2003, the plant area belonging to Kimberly-Clark a. s. expanded considerably to the north, its northern edge advancing into close proximity of the Cihelny part of town. In this year, archaeological excavations were oriented around a gas pipeline trench that ran for a total length of some 520 m along the inside of the newly-erected perimeter fencing, on plots 2290/16, 2407/18 and 2407/19.

It was possible to identify two large features during the documentation of the northern section of the northern branch of this trench – feature 1329, some 21 m in length, and feature 1330, some 27 m in length (there being a gap of some 120 m between these). Feature 1329 comprised 11 parts, each formed in the profile by a square pit measuring roughly 1 m along each side, and roughly 60 cm deep. The majority of these were burned to black in their lowest sections, above which was brick detritus with a black surface and black, burned earth. Between the two layers was a thin stratum of ochre- to yellow-coloured sandy earth. Above these layers there was brick detritus with pieces of brick and an admixture of earth. The entire situation was in turn covered by plough soil. The substrate comprised a white, dusty, compact clay/earth, and below this was a red, clayey earth *(figs. 4, 5)*. An analogous situation was documented in feature 1330, which had 14 parts similar to those found in feature 1329 *(Bláha – Sigl 2004, 57-58, 62-64)*.

Fig. 4. Jaroměř, Kimberly-Clark works. Feature 1329/2003 (set of field kilns) and a detail of one part thereof.
Obr. 4. Jaroměř, areál Kimberly-Clark. Objekt 1329/2003 (baterie polních pecí) a detail jedné z jeho částí.

Both features may be interpreted as the remains of originally larger production facilities. The regularly placed square pits with fired bases and a fill comprising brick fragments clearly represent the remains of a duct used for heating or firing.

The shape of these features, their location in the forefield of the Josefov fortress and the placename evidence cited above (on which see *Kuběnka 1968*, 154) make it possible to express the opinion that these are the remains of field brick kilns of the second half of the 18th century. Such kilns are similar to charcoal burners, made from bricks destined for firing. The fuel (wood, peat, coal) is burned – unlike the situation in charcoal burners – on a grating made from raw bricks. Such kilns were built either in open areas, or sunk into the ground. Ashpits and forehearth were dug from the ground, both to a depth of around 50 cm; ashpits were around 45 cm wide, at roughly 1 m intervals. Across the ashpit flat pieces of iron were laid or alloy were laid, and with the aid of further layers of bricks the heating channel was created. More bricks, intended for firing, were then aligned on this. Generally, such a kiln would have had four to six heating channels, each 5 m long (due to feeding and raking). The heat created by the burning of the fuel on the grating dried and fired the aligned bricks. The disadvantages of this type of kiln were the high consumption of fuel and the number of unsuccessful bricks generated (in summary see *Fiala undated*, 19-21; *fig. 6*).

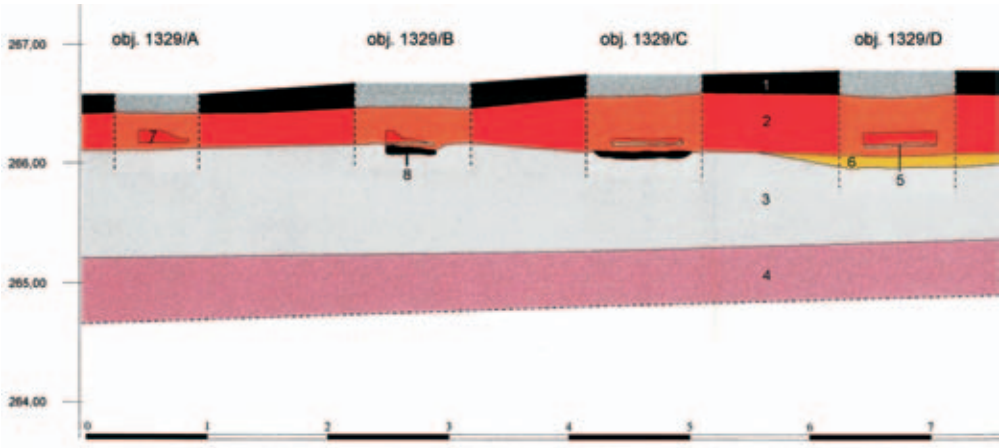
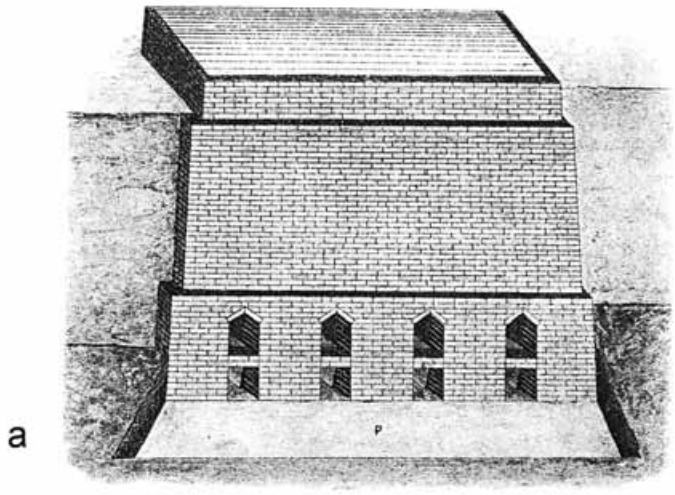
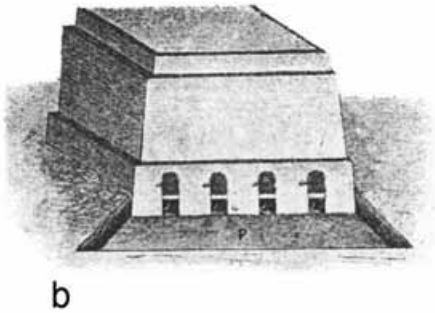


Fig. 5. Jaroměř, Kimberly-Clark works. Section through one part of feature 1329/2003 (set of field kilns) with the contexts marked. 1 – plough soil (grey-brown earth with numerous small brick fragments); 2 – brick dust with an admixture of earth; 3 – white, dusty, compact earth; 4 – red clayey earth; 5 – yellowing ochre sandy earth (thin, only beneath 9); 6 – brown dirt band; 7 – brick detritus with black surface in a matrix of black, fired earth; 8 – layer 3, burned black.
Obr. 5. Jaroměř, areál Kimberly-Clark. Řez jedné z částí objektu 1329/2003 (baterie polních pecí). 1 – ornice (šedohnědá hlína s četnými drobnými úlomky cihel); 2 – cihlová drť s příměsí hlíny; 3 – bílá prachovitá kompaktní hlína; 4 – červená jílovitá hlína; 5 – žlutě okrová písčitá hlína (tenká, jen pod 9); 6 – hnědý proplástek; 7 – drť cihel s černým povrchem a s černou spálenou hlínou jako matrix; 8 – do černa propálená vrstva 3.

Other groups of features apparently linked to brickmaking were found during the excavations of 2000, 2001 and, most especially, 2004, south of the trench dug in 2003 (*fig. 7)*. In particular there were two groups of grooves (3 and 4 grooves in each), oriented east-west. Each such groove was 6-8 m in length, around 1 m wide and 50 cm deep. Their fill comprised brick fragments. The distance between the individual grooves was 1-2 m, while there was 10 m between the two groups (*fig. 8*). These feature groups may be interpreted as the remains of the heating channels for kilns, or "ashpits", similar to those described in the aforementioned brickmaking handbook.





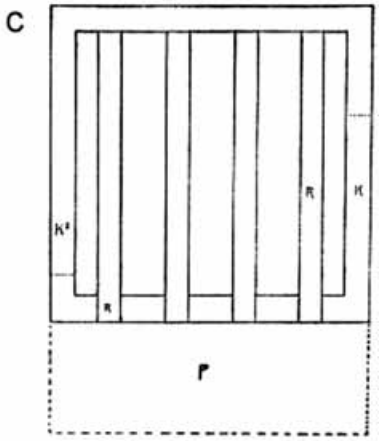


Fig. 6. A type of field kiln, in a period brickmaking handbook. a) field kiln in the ground; b) kiln built in an open area; c) plan of a field kiln. Abbreviations: K – channel, P – forehearth pit; R – grating. After *Fiala, undated*, 20, 22.
Obr. 6. Typ polní pece v dobových cihlářských příručkách. a) polní pec v zemi; b) pec stavěná na volném prostranství; c) půdorys polní pece. Vysvětlivky značek: K – kanál, P – předpecní jáma, R – rošty. *Podle Fialy*, b. d., 20, 22.

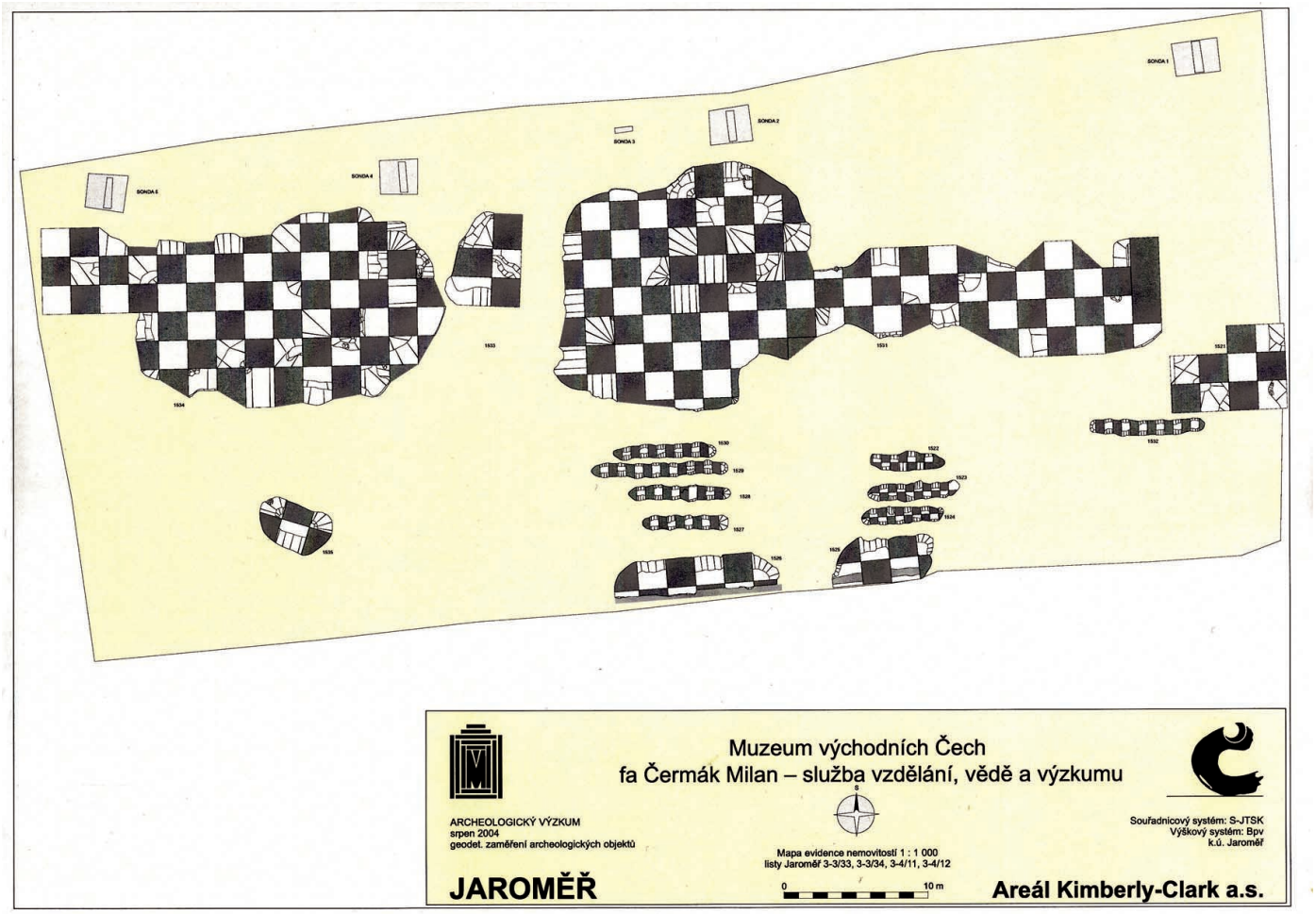


Fig. 7. Jaroměř, Kimberly-Clark works. Ground plans of features 1523 and 1531/2004 (relicts of kilns and earth pits).
Obr. 7. Jaroměř, areál Kimberly-Clark. Půdorysy objektů 1523 a 1531/2004 (relikty pecí a hliníky).

The last feature type recorded came from immediately north of the aforementioned grooves. These were extensive, irregular pits, with maximum dimensions of 45 x 20 x 2 m, their long axes always oriented east to west. Their fill comprised brick pieces and brick dust (*fig. 8; Bláha-Sigl 2005*, 57, 61). These Modern features are interpreted as earth extraction pits, closed using production waste.

No whole bricks were found in any of the features described – only brick fragments, either insufficiently fired of overfired products. It can nevertheless be calculated that the original dimensions of these bricks would have been roughly 32 x 16 x 8 cm; they were, therefore, "rampart bricks", of the kind used in the construction of the Baroque bastion fortress at Hradec Králové in the years 1766 (or 1784) to 1789 (on the dimension of brickmaking products see e. g. *Ebel 2001*, 30).

Brick production was associated, as stated above, with the erection of the fortress on the site of the village of Ples, a project which began in 1780. Six field kilns originally stood in the Ples Forest, near the present village of Rasošky, although of course production shifted to the area north-west of Jaroměř, along the current road towards Trutnov, and to the area now occupied by the municipal hospital. In addition to brickworks, wheelwrights' workshops and smithies also sprang up here, along with accommodation for both officers and labourers (*Duška 1884-1885*, 124, 140; *Duška 1908-1909*, 177; *Honl 1968*, 67). The establishment of all these buildings, part of or ancillary to the fortress, required the intensive production of bricks. It is this production and the facilities associated with it that the excavations were able to demonstrate.

Fig. 8. Jaroměř, Kimberly-Clark works. View of feature 1523/2004.
Obr. 8. Jaroměř, areál Kimberly-Clark. Pohled na objekt 1523/2004.

Fig. 9. Jaroměř, Kimberly-Clark works. View of feature 1531/2004.
Obr. 9. Jaroměř, areál Kimberly-Clark. Pohled na objekt 1531/2004.

In closing, it is necessary to emphasise that the rescue excavations conducted at Jaroměř in the area of the Kimberly-Clark a. s. works brought not only a great deal of important information relating to the prehistoric settlement of the region, but above all information relating to the use of this area in the Modern period. They resulted in the valuable excavation and documentation of manufacturing facilities, specifically 18th century brick kilns. The authors believe that further excavations of this type are essential, and will require collaboration with professionals in other related disciplines, in particular history but also in technical fields. It is however clear that for technical facilities of such and similar type, intended more or less for "one-off use", the data recoverable through archaeology are irreplaceable and unsubstitutable.

Resumé:

V rámci předstihového záchranného archeologického výzkumu na stavbě závodu Kimberly-Clark v Jaroměři (*obr. 1*) byly mimo intenzivního pravěkého osídlení zaznamenány také novověké archeologické situace, které lze spojit s místní výrobou cihel (zprávy o jednotlivých výzkumných sezónách viz *Bláha – Sigl 2004; 2005; Sigl –Vokolek 2001; Sigl 2002; 2003*).

Cihly (a další výrobky) byly v této části dnešní Jaroměře vyráběny po roce 1780 pro stavbu pevnosti Ples, dnešní Josefov. Na tuto výrobu upomíná mimo jiné dodnes existující název jaroměřské čtvrti "Cihelny"; její stopy zaznamenávají i kartografické prameny 18. – 20. století (především I., II. a III. vojenské mapování), a to jako pravidelné terénní deprese probíhající zhruba ve směru západ – východ. Objekty související s výrobou cihel byly zjištěny ve výzkumných sezónách 2000, 2001, a především v letech 2003 a 2004 právě na okraji výrazné terénní nerovnosti (*obr. 2, 3*).

V roce 2003 se při dokumentaci severního řezu severní větve plynovodu na parcelách č. 2290/16, 2407/18 a 2407/19 podařilo zaznamenat dva rozsáhlé objekty, a to objekt č. 1329, dlouhý cca 21 m, a objekt č. 1330 o délce cca 27 m (vzájemná vzdálenost mezi nimi činila téměř 120 m). Objekt č. 1329 se skládal z 11 částí, každá tato část byla na profilu tvořena čtvercovou jámou o straně cca 1m a hloubce cca 60 cm. Většina z nich byla v nejspodnější partii do černa propálená a nad ní se nacházela drť cihel s černým povrchem a s černou spálenou hlínou. Mezi oběma vrstvami ležela tenoučká vrstvička

okrové až žluté písčité hlíny. Nad těmito vrstvami byla cihlová drť a části cihel s příměsí hlíny. Celá situace byla v horních partiích překryta ornicí. Podloží bylo tvořeno bílou prachovitou kompaktní hlínou/jílem a ještě níže červenou jílovitou hlínou (obr. 4, 5). Obdobná situace byla dokumentována u objektu č. 1330, který měl 14 částí podobných těm zjištěným v objektu 1329 (*Bláha – Sigl 2004*, 57-58, 62-64). Oba objekty lze interpretovat jako zbytky původně rozsáhlejšího výrobního zařízení. Pravidelně rozmístěné čtvercové jámy s propáleným dnem a zásypem tvořeným zlomky cihel jsou patrně zbytky kanálků s otopnou, respektive vyhřívací funkcí.

Podoba těchto objektů, jejich umístění v předpolí pevnosti Josefov i pomístní název "na Cihelnách" (k tomu viz *Kuběnka* 1968, 154) , umožňuje vyslovit názor, že se jedná o pozůstatky cihlářských polních pecí z druhé poloviny 18. století. Šlo patrně o typ polní žárové pece. Tato pec je podobná milíři, staví se z cihel určených k pálení. Palivo (dříví, rašelina, uhlí) se spaluje – na rozdíl od milíře – na roštech zhotovených ze surových cihel. Tyto pece se stavěly buď na volném prostranství, nebo se zahlubovaly do země. V zemi se vykopaly popelníky a předpecí, obojí do hloubky cca 50 cm, popelníky byly široké asi 45 cm, ve zhruba metrových rozestupech. Napříč popelníky se položily ploché kusy železa nebo litiny a dalšími vrstvami cihel se nad popelníky vytvořily topné uličky. Na ně se pak rovnaly další cihly určené k výpalu. Většinou měl tento typ pece čtyři až šest topných uliček o délce cca 5 m (kvůli přikládání a prohrabování). Žár vyvinutý spálením paliva na roštech vysoušel a vypaloval narovnané cihly. Nevýhodou tohoto typu pece byla vysoká spotřeba paliva a také množství nepovedených cihel (souhrnně *Fiala b. d.*, 19-21; *obr. 6*).

Další skupiny objektů souvisejících zřejmě s výrobou cihel se podařilo zjistit i při výzkumu v roce 2000, 2001 a především v roce 2004 jižně od výkopů rýh z roku 2003 (*obr. 7*). Jednalo se především o dvě skupiny žlabů (po 3 a 4 žlabech), orientovaných ve směru východ – západ. Jednotlivé žlaby měly délku 6-8 m, šířku cca 1 m a hloubku 50 cm. Jejich výplň tvořily zlomky cihel. Vzdálenost mezi jednotlivými žlaby ve skupině činila 1-2 m, vzdálenost mezi oběma skupinami pak okolo 10 m (*obr. 8*). Tyto skupiny objektů lze interpretovat jako zbytky topných kanálů pecí, respektive tzv. popelníků, podobných těm, které popisují výše zmíněné cihlářské příručky.

Poslední typ objektů byl zaznamenán bezprostředně severně od výše zmíněných žlabů. Jednalo se o rozsáhlé nepravidelné jámy o maximálních rozměrech 45 x 20 x 2 m, orientované svojí delší stranou opět ve směru východ – západ. Výplň tvořily části cihel a cihlová drť (*obr. 8; Bláha – Sigl* 2005, 57, 61). Tento typ novověkých objektů interpretujeme jako hliníky, zavezené výrobním odpadem.

Ani v jednom ze zde presentovaných objektů nebyla nalezena celá cihla, pouze jejich zlomky, a to buď nedopálené či přepálené nepovedené výrobky. Přesto lze dovodit, že původní rozměry těchto výrobků činily zhruba 32 x 16 x 8 cm; jednalo se tedy o tzv. cihly „šancovky", používané též při stavbě barokní bastionové pevnosti v Hradci Králové v letech 1766 (respektive 1784) – 1789 (k rozměrům cihlářských výrobků např. *Ebel 2001*, 30).

Výroba cihel souvisela, jak již bylo uvedeno výše, se stavbou pevnosti na místě vsi Ples, která byla zahájena v roce 1780. Šest polních pecí stálo původně u Plesského lesa u dnešní vsi Rasošky, hlavní výroba se ovšem přesunula do prostoru severozápadně od Jaroměře, podél dnešní státní silnice ve směru na Trutnov a do míst dnešní městské nemocnice. Mimo cihelen zde také vznikly kolářské a kovářské dílny a domy pro ubytování důstojníků a dělníků (*Duška 1884-1885*, 124, 140; *Duška 1908-1909*, 177; *Honl 1968*, 67).

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Renaissance glassworks in Broumy

Renesanční sklářská huť v Broumech

Eine renaissancezeitliche Glashütte in Broumy

Jaromír Žegklitz

1988-1989 verlief im Raum der aufgelassenen, von Kryštof Schürer zwischen 1596 und 1599 gegründeten Renaissance-Glashütte in Broumy eine Rettungsgrabung. Auf der durch die Bauarbeiten vorgegebenen Fläche wurden die Überreste von zwei größeren Objekten gefunden: eines zumindest zweiräumigen gemauerten Hauses, das auch mit einem Kachelofen und einem wohl zusätzlichen Glasofen (wohl Temperofen, zum Aufwärmen der Schmelzpfanne, evtl. ein Muffelofen zum Emaillieren) ausgestattet war. Während das Haus in Folge eines Brands im Jahr 1600 nicht mehr bewohnt war, diente der Ofen selbst dann noch im ganzen 17. Jahrhundert. Das bei der Grabung gefundene Glas (Rohglas, Fertigwaren, Ausschuss und Halbfertigwaren) legt ein Zeugnis über das hier produzierte Sortiment der Hütte ab, die zu jener Zeit auch Bestellungen direkt vom Prager Kaiserhof Rudolfs II. entgegennahm. Zu den interessantesten Funden gehören auch Halbfertigwaren, die zur Produktion von Fadenglas bestimmt waren, sowie Fragmente von mit dieser Technik verzierten Fertigwaren, Nachahmungen von Venezianischen Stücken. Mit Rücksicht auf die Anwesenheit dieser Artefakte auch in den ältesten Schichten noch vor dem Brand von 1600, handelt es sich um einen der ältesten und gleichzeitig auch am besten dokumentierten Belege für die Produktion dieses Glastyps im Böhmischen Raum.

In 1988-1989, an archaeological rescue excavation was carried out on a deserted glassworks in Broumy, in response to unannounced groundwork on the inner grounds of the former glassworks, during which almost 150 m^2 of area was destroyed, including all the archaeological contexts it contained. On the southwest wall of the building pit, it was possible to see walled structures, the function of which was unclear, and a thick cultural layered formation, containing a substantial amount of waste from the glassworks' operations. The rescue excavation took place on an area directly adjacent to the construction pit, with the aim of investigating the affected structures and the connected area of the interior of the demolished barn where, in connection with the intended construction, disturbing of the terrain was also planned.

1. The history of the glassworks

After a long period during which the Czech mediaeval glassworks production flourished in the 14th and 15th centuries, it went into decline at the end of the 15th century, manifested in the considerably smaller numbers of glass turning up among archaeological finds. This situation continued to the mid-16th century, when German glass-making families began settling mainly in the border regions of the Czech lands (northern and southern Bohemia) and in Silesia, moving into these regions from areas in the Saxony region of Krušné hory (the Ore Mountains). A substantial rise in the price of one of the most important ingredients in glass production, the price of wood, in connection with the rapid development of mining and metal-working on the German side

of Krušné hory, forced members of the Saxony-based glass-making families (the best-known of which, for example, were the Schürers, Preusslers, Friedrichs, and Wanders) to look for opportunities to pursue their trade elsewhere. The glassworks in Falknov, established in 1530 by Pavel Schürer, was the first now known and the most prominent glassworks founded in the Czech lands as a result of this migration. Many other new glassworks were founded over the course of the second half of the 16th century and the start of the following century (e. g. Krompach, 1545 Deštné in Orlické hory, 1558 Huť u Zásady, before 1562 Rokytnice in Krkonoše (the Giant Mountains), before 1577 Rejdice, Mšeno u Jablonce, 1605 Prague-Bubeneč, circa 1606 Vítkovice in Krkonoše, 1614 Bedřichov – *Drahotová et al. 2005*, 125-135).

New glassworks were founded both in the borderland regions of the country and in the forested inland areas where, in addition to the abundance of wood, other raw materials were available for glass production, such as quality quartz sand or quartz. Křivoklát was one such region which, thanks to the favourable conditions, began attracting the attention of people interested in establishing glassworks at the start of the 1570s.

The first to attempt to found a glassworks in Broumy was the Prague-based Italian glassmaker Mikuláš Perlo. While he was granted permission in 1572 from King Ferdinand I to establish a glassworks, the specific terms of the contract he was presented with by the Křivoklát commissioner Václav Oulický of Oulice were so unfavourable that he abandoned his initial intention (*Kočka 1936*, 176-177).

Another attempt made 17 years later also ended unsuccessfully, behind which was an unknown smelter (worker or owner of works) from Blatná u Jáchymova. Although the Křivoklát commissioner at that time, Jan Jindřich Prollhofer of Purkersdorf, recommended the construction of the works to the Czech Chamber, for reasons now unknown it came to nothing (*Kočka 1936*, 177).

The third case of a request to found a glassworks in this region came from the Kryštof Schürer, son of the founder of the Falknov glassworks Pavel Schürer. This occurred in a letter addressed to the Emperor in 1596, when Kryštof had already been the head of glassworks in Falknov for twenty-six years and was not entirely unknown to Rudolf II, as before that date he produced "allerlei Instrumente und glöser" (*Psota 1958*, 430) that had been directly commissioned by Rudolf II. This was evidently also one of the reasons why the Emperor charged the Křivoklát commissioner Prollhofer, who this time was not in favour of the foundation of the glassworks, to accommodate Schürer and ordered him to find an appropriate location on the Křivoklát demesne for the construction of the glassworks. The contract for the construction of the glassworks in Broumy, concluded between Prollhofer and Schürer sometime between 1596 and 1599, was then confirmed by Imperial Charter on 10 July 1599.

Based on the contract, Kryštof obtained hereditary ownership of six tracts of land to build a house, farmstead, and glassworks and establish fields, meadows, and a pond. He acquired the right to build a mill with one millwheel, a sawmill, and houses for the workers (who, unlike Schürer, his children, and the next owners of the glassworks, were in the position of serfs), and also the right to slaughter cattle and run a meat shop, to bake bread for sale, and to serve beer, but only beer from the breweries in Křivoklát or Točník (see *Pelc 1951*, 8-19). With the permission of the gamekeeper, he could in the autumn and the winter take fallen wood to burn for ash to use as a fluxing agent. The building where the fluxing was done evidently stood on the site of where building no. 43 stands today; when construction work was carried out on this

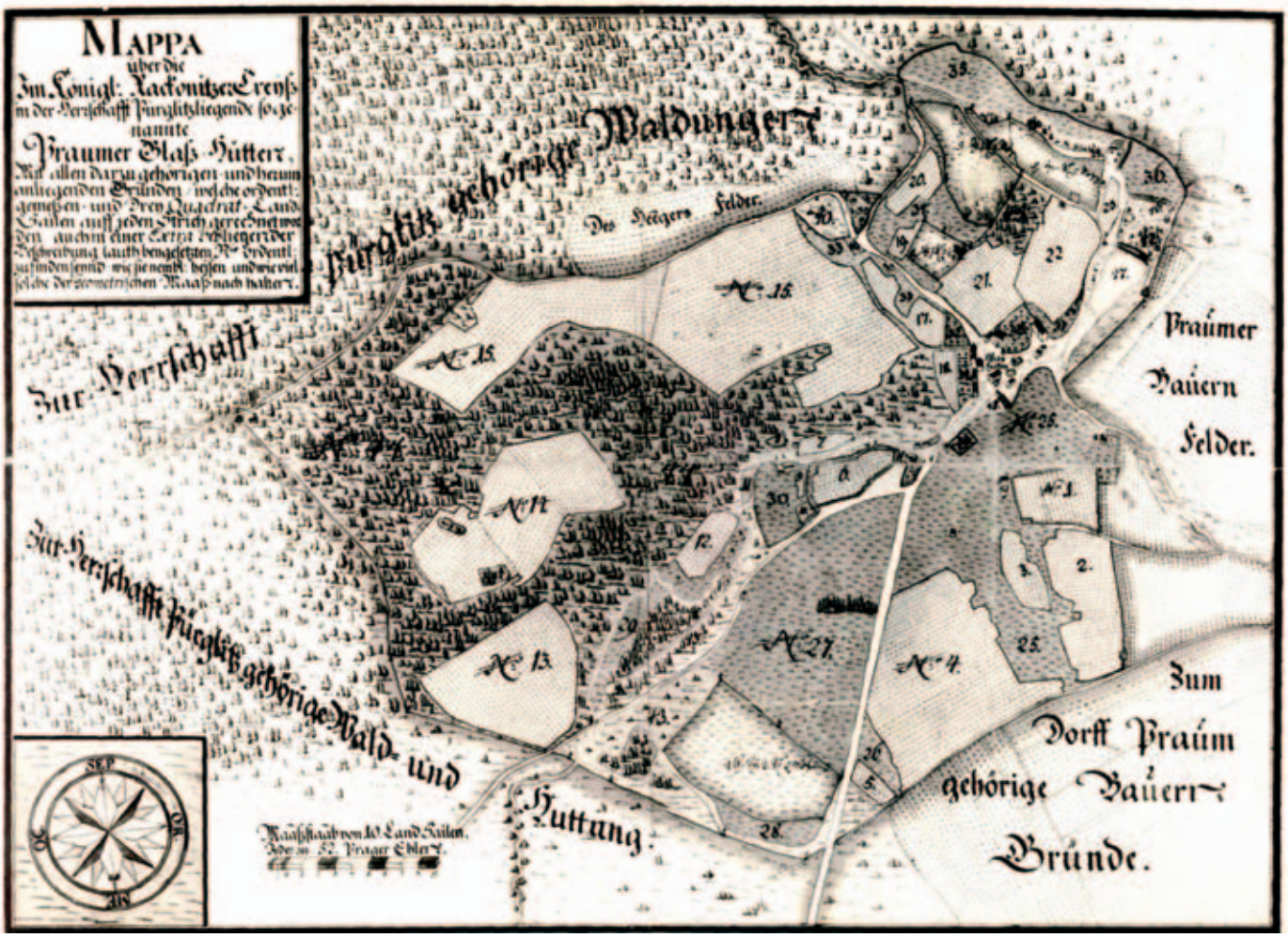

Fig. 1. Broumy. Map of the grounds of the glassworks, with all the land, from 1751.
Obr. 1. Broumy. Mapa areálu hutě se všemi pozemky z roku 1751.

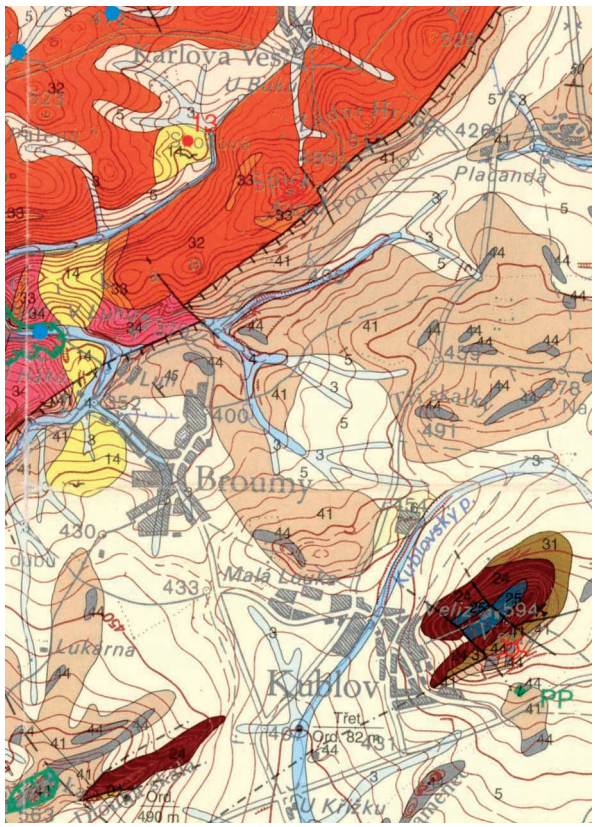

Fig. 2. Geological conditions in the area around Broumy. Detail from a geological and scientific map of the Křivoklát region (*Křivoklátsko 1997*). Directly in the location of "V luhu" and around it, Miocene river and lake sand, gravel, and clay, with deserted sandpits (no. 14 – yellow), south and southwest of the village, islands of Ordovician, Libeň and Dobrotiv formation – quartzite (no. 24 – dark red-brown).
Obr. 2. Geologické poměry v okolí Broum. Výřez z geologické a přírodovědné mapy Křivoklátska (*Křivoklátsko 1997*). Přímo v poloze „V luhu" a jejím okolí miocénní říční a jezerní písky, štěrky a jíly s opuštěnými pískovnami (č. 14 – žlutá), jižně a jihovýchodně od vsi ostrůvky ordovického libeňského a dobrotivského souvrství – křemence (č. 24 – tmavě červenohnědá).

building in the first half of the 20th century, a massive two-metre layer of ash was allegedly uncovered (*Psota 1958*, 434; also names on the local map from 1751 serve as evidence of its position: no. 12 – "u popeláře", no. 29 – "za popelářem louka" – see *fig. 1*; "popel" means ash, "popelář" is a man producing ash). The glassworks was supplied with sand that, according to tradition, was mined from a hill opposite the works on the right bank of Úpořský Creek (*Psota 1958*, 433-434; see *fig. 2*).

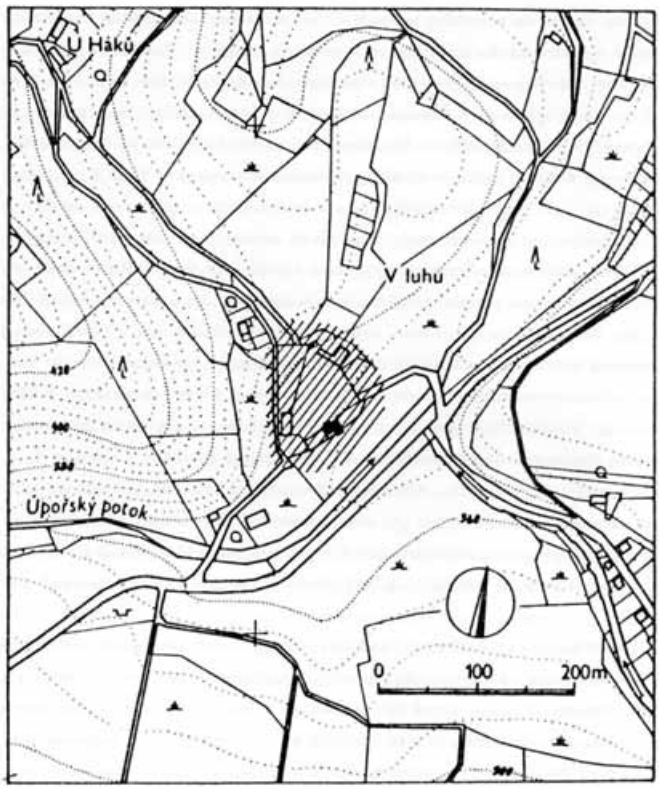

Fig. 3. Plan of the "V luhu" part of Broumy showing the probable area of the production grounds of the glassworks (in hatching) and the sites of archaeological excavation (in black). Groundwork reproduced from an article by *M. Pertl, 1988*, 223.
Obr. 3. Plán místní části obce Broumy „V luhu" s vyznačením pravděpodobného rozsahu výrobního areálu sklářské huti (šrafovaně) a plochy archeologického výzkumu (černě). Podklad reprodukován z článku *M. Pertla, 1988*, 223.

In exchange for the privileges granted, the owner of the glassworks was required to pay, on St. George's day, 1560 Meissen groschen (some sources state 1200 Meissen groschen – cf. *Kočka 1936*, 178) and 1200 Meissen groschen on St. Gallen's day, and in addition a chest of window glass, or to substitute this with another 240 groschen (*Pelc 1951*, 19).

The construction of the glassworks at the location of "V luhu" on the left bank of Úpořský Creek northwest of the village centre (*fig. 3*) most likely began immediately after the contract was agreed between Schürer and the Křivoklát commissioner, before the Imperial Charter was issued, as in 1600 the entire glassworks, including the residential buildings and outbuildings, were already completed. However, after operating just very briefly, that same year, "by the will of God and the actions of wicked men", it burnt down. Kryštof Schürer immediately set about rebuilding the glassworks, the operations of which (after another small fire, during which construction wood caught fire) were launched again in 1603. The glassworks at that time was already in the hands of Kryštof's son Pavel, who came to Broumy – just like his father – from Falknov. At the intercession of the Křivoklát commissioner ("as Širer is a diligent man and good artist, who works hard for the imperial court and whose work is the best in all the land" – see *Pelc 1951*, 21) the Czech Chamber, owing to the damages suffered, relieved Pavel of the large portion of the rent owed and also permitted him to brew beer, which he was allowed to sell to two neighbouring villages; in return his annual rent was raised to 3600 Meissen groschen. At that time Pavel also built a small pond with a mill and sawmill in front of the glassworks, where planks of wood for use in the glassworks and for sale were cut (*Pelc 1951*, 21).

Pavel's work for the Prague court was greatly valued, not just by commissioner Prollhofer, but also by the Emperor himself. When Pavel was called on by the owner of the Sloup demesne, Adam Berka of Dubá, to return to Falknov where, during his absence, the glassworks there was run by Pavel's brother Eliáš, he turned to the Emperor, sending him a letter on 8 May 1604 for permission to remain in Broumy (referring to the fact that at the time he was working on another Court commission, including "etliche Sachen und Feuerarbeiten" – *Psota 1958*, 432). His request was granted the very next day, that is, with a kind of speed that was exceptional at that time. More evidence of the Emperor's favour is that, in 1592, he elevated some of Schürer's family members to the rank of the nobility, granting them the prepositional title "of Waldheim" and a coat-of-arms.

Under Pavel's management the glassworks prospered, which was reflected in the increased wealth of its owner: in Broumy he bought Štěpánovský manor, in 1611 he bought the magistrate's house and a pub in Hudlice for 36000 groschen, and in 1624 for 90000 Meissen groschen he bought the ironworks in Dobřív at Rokycany (*Kočka 1936*, 178; *Pelc 1951*, 25-26).

The age of glassworks' ascendancy ended with the conflicts and the difficulties that were ushered in by the Thirty Years War. Broumy was directly affected by the conflict in 1634, when the village was pillaged by the imperial army returning from Cheb to Prague; eight years later the population of Broumy had to hide in the forest from soldiers again (*Pertl 1988*, 225). Comments made

by the Křivoklát commissioner named Hogen from the start of the 1650s inform us that "the works has many debts and has been destroyed by soldiers" (*Kočka 1936*, 179). The impacts of the war understandably had a long-term effect on the substantial decline in demand and thus also production: even earlier, in 1646, the Křivoklát commissioner Bauller informed the Czech Chamber that glass was not selling well, the glassworks often did not operate, and its owner owed 66 guldens in rent (*Pelc 1951*, 27).

It was in these circumstances that Pavel Schürer died in 1647. His property and debts were, by an agreement concluded in 1650 in the presence of the deputy commissioner Jan Rafael Gallides of Rosendorf, divided between his widow Kateřina and six sons and three daughters, so that the glassworks and the farm buildings passed into the hands of Pavel's second-born son Kašpar. He managed in twenty years to buy out his siblings and settle old debts, but it was beyond his means to keep the glassworks operating continuously and without incurring new debts, and therefore, in 1671 "greatly incapacitated and poor", he sold it for 1500 gulden (*Pelc 1951*, 46).

After more than seventy years the glassworks passed out of the Schürer family's hands into those of a new owner, Jan Rieger, who sometime before 1654 came to the glassworks in Broumy from Rokytnice nad Jizerou and worked at the glassworks. Under Rieger's management, all the debts were settled and the glassworks began to prosper again. However, after his death in 1690, the situation changed again, when his oldest son Jan took over the glassworks. The problems were considerably exacerbated by the change in the owner of the Křivoklát demesne: Arnošt Josef of Valdštejn, who bought it in 1685, prohibited the sale of wood to the glassworks. Consequently, it was necessary to import ash, which added disproportionately to the costs of production. The glassworks never recovered from this situation – a report from 1715 describes "manifold rundown buildings, the glassworks in shambles" (*Pelc 1951*, 76). In the following years, ownership of the glassworks alternated between various members of the Rieger family, with Jan (Kryštof) Rieger, Jr., who died in 1743, being the last active glassmaker in Broumy. After his death, the deserted glassworks remained in the hands of the Rieger family for eight more years. In 1751 Jan's widow, Kateřina, sold it to Marie Anna of Fürstenberg, and the glassworks and its grounds were reconstructed for use as a farm. On this occasion the new owner had an official surveyor re-measure the site and sketch all the land belonging to it; the map (*fig. 1*), which still exists today, is valuable testimony of the appearance of the full grounds and the glassworks itself, not just in the mid-18th century, but also at earlier periods, as the written sources indicate that throughout the time that it was in service, no substantial structural changes were made; not only in terms of its basic structure, but also in many details, the appearance of the landscape and many of its structures have survived to date.

Written sources are valuable evidence about even the variety of products manufactured at the Broumy glassworks and about the customers. It was mentioned above that the founder of the glassworks, Kryštof, and his son, Pavel, manufactured goods commissioned for the Emperor himself, and not just glass intended as tableware, but also glass that could be described as technical or laboratory ("allerlei Instrumente und glöser" – *Psota 1958*, 430, "etliche Sachen und Feuerarbeiten" – *Psota 1958*, 432; *Pelc 1951*, 22). The Rieger family also continued to produce this kind of glass: in 1673 responding to a question posed by the Czech Chamber with regard to an order for the production of glass jars, the commissioner of Zbirov passed on the words of the Broumy head

of glassworks that "such jars must be heat-resistant and therefore must be made of special material" (*Pelc 1951*, 29).

There is evidence of goods produced for Prague Castle – they were not ordered directly, but indirectly through a different supplier – in an unpaid debt owed to Schürer's Broumy glassworks that remained after the death of the court glassmaker Jan Šmid of Tübingen in 1610 (*Winter 1909*, 525).

According to reports from the years 1690 and 1692, the Broumy glassworks supplied glass products not just to Prague Castle, but also to Prague, and both to glaziers who traded further in them (papers from Jan Rieger's estate after his death in 1690 mention the Prague-based glaziers Wenzl, Werner, and Berger, who owed the company for a supply of glass – *Pelc 1951*, 58) as well as directly to clients (pharmaceutical bottles for pill peddlers and apothecaries, lamps and night dishes); goods from Broumy were sold at regular Prague markets, which was probably what the storehouse in Prague was intended for (*Pelc 1951*, 30, 61).

Written sources mention other types of glass, such as circular window glass, pots and jugs, supplied to Křivoklát (*Pelc 1951*, 30-31, 81, 83), but it can be said almost with certainty that among the items of trade – and not just at the Prague markets – were also other types of glass products that are not explicitly mentioned in the written sources.

Archive sources provide information not only on the types of glass that were manufactured at the Broumy glassworks, but also about the decorations on the glass. In 1642-1651, the sources mention a painter by the name of Jiří Preissler (Prayssler) working in Broumy; in 1655 the Beroun register of christenings reports a Broumy painter named Jan Krejčí; in 1671 the painter Jakub Šmíd is mentioned; and two years later another painter named Antonín Rottmüler (*Pelc 1951*, 28-29). In addition to painters, engravers also worked there – an entry in the parish register in Žebrák in 1689 mentions Michal Wintr as the "glass engraver" at the glassworks in Broumy (*Pelc 1951*, 29). It would certainly have been possible to find mentions of craftsmen, or artists in these fields, even earlier and perhaps in larger numbers; the almost continuous series of entries in the parish registers, from which most of the information on the people working in the glassworks came from, however only begins after the mid-17th century. Moreover, the profession is not always indicated under the names mentioned in written sources.

2. The results of archaeological excavation

2.1 Field context

- 2.1.1 The residential building

Two notable structures were identified on a surface area of approx. 55 m^2 unearthed during the archaeological excavation southwest of a building pit in the former interior of the barn demolished not long before.

The first structure was the remains of a building, comprising at least two rooms. Of this structure, only the level below the surrounding terrain survived, set in the narrow and shallow foundations of the outer wall made of a single layer of stones and boulders bonded with clay (*fig. 4, feature 9/1*). The interior space was divided by a partition wall (*fig. 4, feature 3*), the only evidence of which again was the shallow foundation section.

In the trampled down, and in places re-burnt, clay floor (*fig. 12, layer 3*) of the southwest room, 360 x 340/360 cm in size, the excavation unearthed

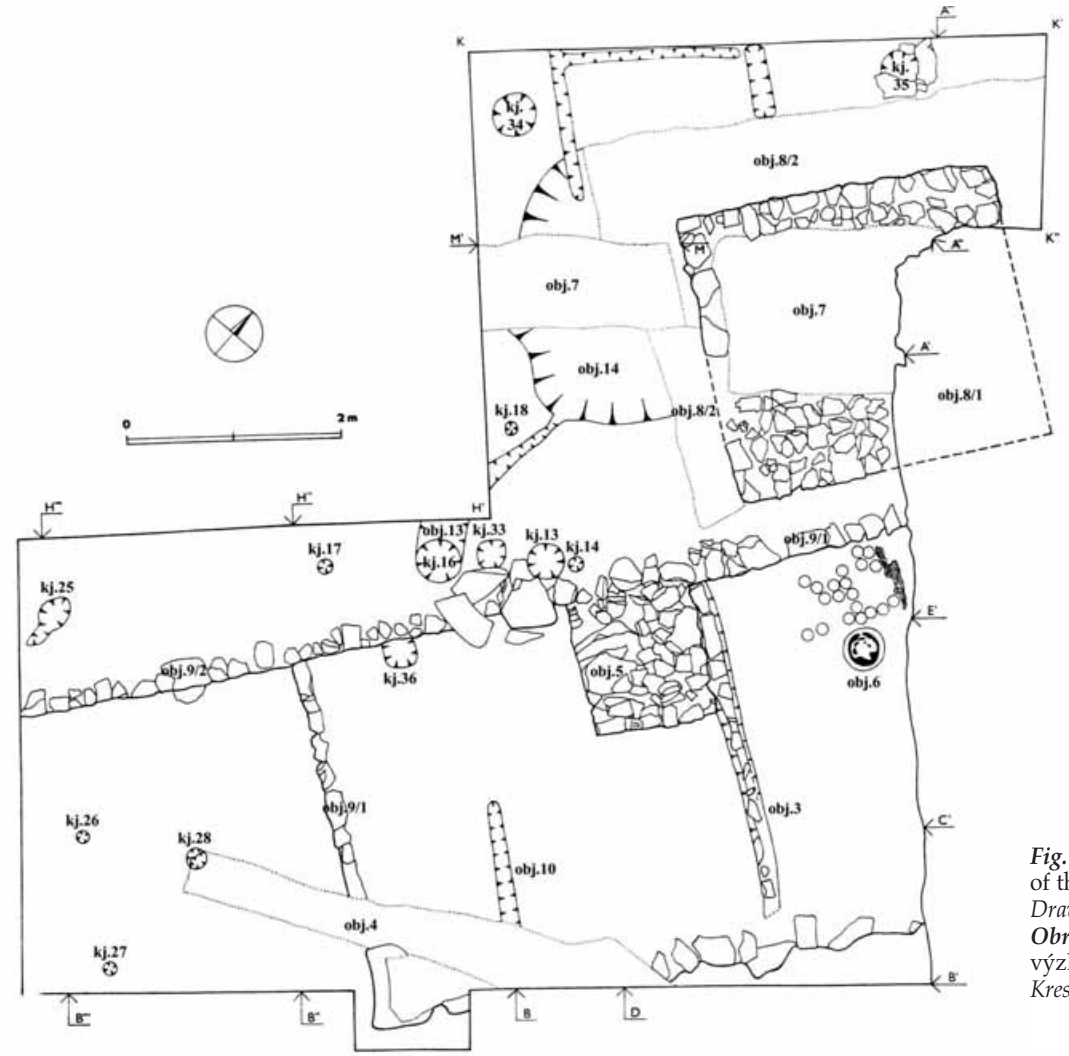

Fig. 4. Broumy, genersl layout of the excavation, early phase. *Drawing by J. Žegklitz, J. Růžička.*
Obr. 4. Broumy, celkový plán výzkumu, nejstarší fáze. *Kresba J. Žegklitz, J. Růžička.*

a gutter of undetermined function, located perpendicular to the southeast outside wall – perhaps the remains of some interior structure in the form of a semi-partition (*fig. 4, feature 10*).

Towards the room's northern corner, a 30 cm high plinth, 120 x 125 cm in size, was found fixed against the wall, and was built of stones bonded with yellow clay (*fig. 4, feature 5*; *fig. 5*). Directly on its surface and immediately around it, a substantial amount of fragments of chamber tiles, frame tiles, and pot-shaped tiles were scattered; this made it possible to identify the unearthed structure as the base of a tile stove structure. This unique archaeological context (the find of a stove base, the sudden destruction of the structure – see below) and a detailed analysis of the tiles and other structural elements (the upper bell-shaped cover, the rectangular earthen-clay cover slabs, and the flues) then made it possible to attempt a drawing reconstruction of the stove (*fig. 6*). This has already been the subject of a separate study (*Žegklitz – Hazlbauer – Chotěbor 1992*), so here we will only mention that the presence of some types of chamber and frame tiles (especially the late Gothic castellated mantel tiles – *Žegklitz 1987*, 656, 669; *fig. 7: 1*, and also the row tile decorated with flowers framed by Renaissance architecture, typical for the period around the 16th century – cf. *Hazlbauer – Špaček 1986*, 154, 157; *fig. 7: 2*) at the very end of the 16th century is somewhat surprising and testifies to the relatively long survival of some archaic features into later periods.

The entrance was located in the northwest outer wall immediately next to the stove. Part of the massive arch of the jamb cut from sandstone (*fig. 8*) forms

Fig. 5. Broumy. Stone base of the tile stove, remains of the entrance on the right (part of the sandstone arch of the jamb, the post-holes for the roof construction, and the large stones forming the original threshold or step). *Photo by J. Žegklitz.*
Obr. 5. Broumy. Kamenný podstavec pro kachlová kamna, vpravo od něj pozůstatky vstupního otvoru (část pískovcového oblouku ostění vchodu, kůlové, resp. sloupové jámy po zastřešovací konstrukci a větší kameny tvořící původně práh či schodový stupeň). *Foto J. Žegklitz.*

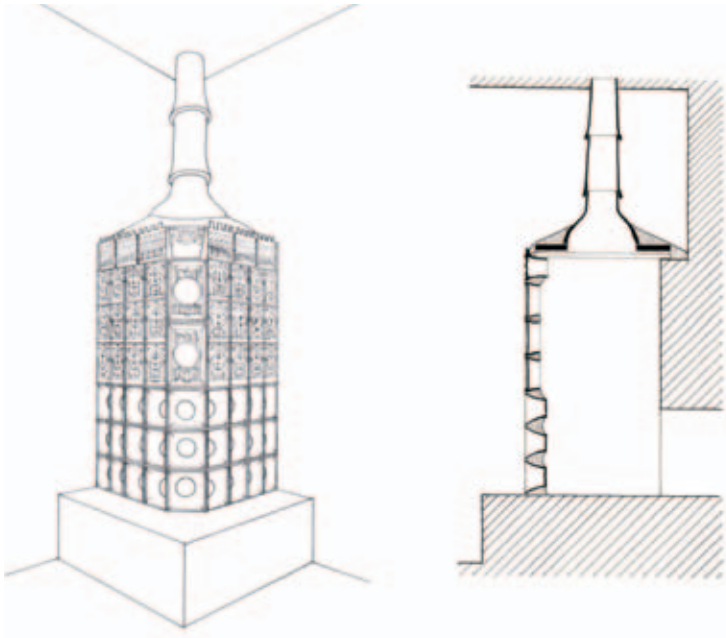

Fig. 6. Broumy, drawing reconstruction of the tile stove – perspective view and vertical section. *Drawing by P. Chotěbor.*
Obr. 6. Broumy, kresebná rekonstrukce kachlových kamen – perspektivní pohled a svislý řez. *Kresba P. Chotěbor*

evidence of its location, along with several large flat stones, probably the remains of a threshold or step (the level of the interior floor lay 15-20 centimetres lower than the level of the outside terrain). Some of the post-holes located outside the outer walls of the building may also be connected with the entrance (*fig. 4, post-holes 13, 14, 16, 33*) – they may be the remains of a structure that served as a roof over the entrance.

The presence of stove tiles is reliable evidence that the room was regularly used by people. Considering its dimensions and that it has a floor made only of trodden down clay, and given that the stove was built of unglazed and – in artistic terms – "unmodern" tiles, with rather poor-quality relief decorations, it was not a stately structure of any kind, and it can be assumed that it was not used as a place of permanent accommodation, but rather as an office or a space of similar operational function.

Even the interior of the adjacent room, largely destroyed by the building pit, says little about the function it served. The only remains of any kind of furnishings unearthed in the excavation was a wooden shelf or chest along the northwest wall, documented by the carbonized remains of wood, which contained stored glass products – especially circular window discs piled in columns (*fig. 9*), and even the small pharmaceutical bottles. Close by, towards the centre of the room, directly on the floor, there was a 4-5 centimetre plate of pure, light-grey to almost beige-coloured clay in the shape of a circle with a diameter of 40 centimetres and with a smaller concentric circle irregularly stained with carbon in a dark grey to black colour (*fig. 4, feature 6*; *fig. 10*), which probably served as a base for a wire basket with embers, which were used to heat the room. This may have been used in connection with the tile stove, which was probably served through a wall opening into this corner of the adjacent room.

There is no direct evidence of the appearance of the surface structure of the building. However, the location of the tile stove inside the building suggests that it was a masonry structure. From the straight, sharp edge of the clay floor of the interior, lining just an approx. 16 centimetre wide foundation ditch, it may also be inferred that the above-grade masonry was not made of stone, but of brick, fragments of which – albeit in limited quantity – were present in the termination layers inside the interior (*fig. 13, layers 79, 95, 96*).

The subtle foundations also suggest that it was a one-storey structure. The northwest outer wall continued in the southwest direction and even beyond the western corner of the building (*fig. 4, feature 9/2*). Given the scope of the area surveyed, it is not possible to say anything more specific about its function.

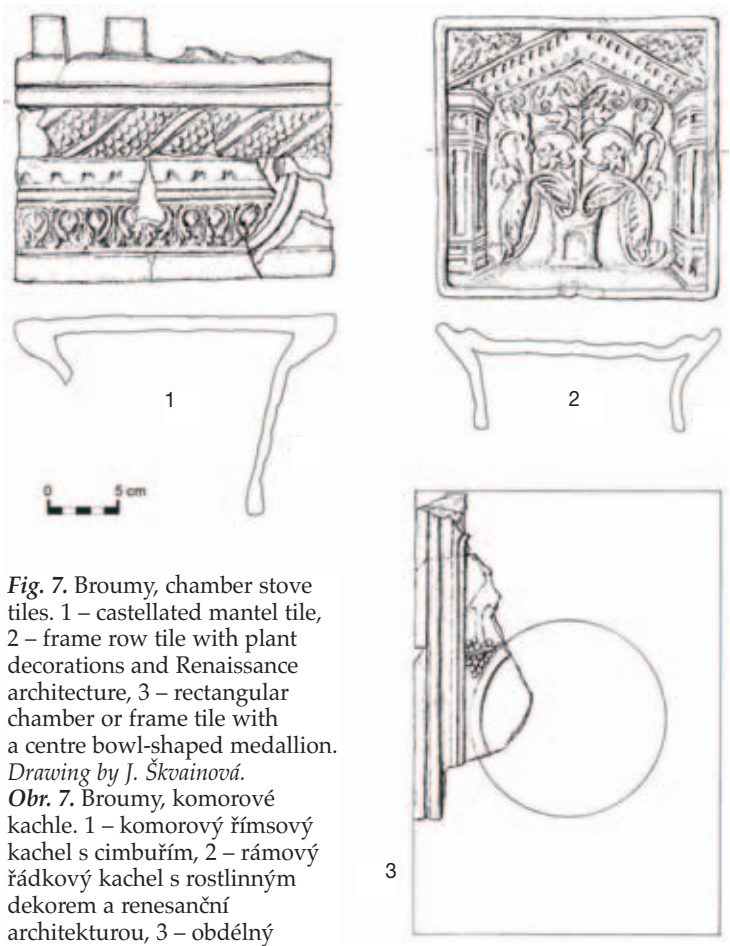

Fig. 7. Broumy, chamber stove tiles. 1 – castellated mantel tile, 2 – frame row tile with plant decorations and Renaissance architecture, 3 – rectangular chamber or frame tile with a centre bowl-shaped medallion. *Drawing by J. Škvainová.*
Obr. 7. Broumy, komorové kachle. 1 – komorový římsový kachel s cimbuřím, 2 – rámový řádkový kachel s rostlinným dekorem a renesanční architekturou, 3 – obdélný komorový či rámový kachel s centrálním miskovitým medailonem. *Kresba J. Škvainová.*

Fig. 8. Broumy, detail of the sandstone arch of the entrance jamb. *Photo by J. Žegklitz.*
Obr. 8. Broumy, detail pískovcového oblouku ostění vchodu. *Foto J. Žegklitz.*

Fig. 9. Broumy, columns of piled glass window discs from the fire horizon, dated to 1600. *Photo by J. Žegklitz.*
Obr. 9. Broumy, sloupce naskládaných skleněných okenních terčíků z požárové vrstvy datované do roku 1600. *Foto J. Žegklitz.*

Fig. 10. Broumy, clay base for a wire basket for heating using embers. *Photo by J. Žegklitz.*
Obr. 10. Broumy, jílová podložka pod drátěný koš k vytápění žhavými uhlíky. *Foto J. Žegklitz.*

A relatively thick layer of greyish-yellow to whitish trodden down clay, without any archaeological finds, resting up against this wall on its northwest side (*fig. 12, layer 58; fig. 13, layer 58*) and lying in a rust-coloured earth-and-clay soil horizon (*fig. 12, layer 2; fig. 13, layer 2*), was clearly artificially and deliberately piled at this spot during the first stage of the construction of the glassworks, probably with the aim of creating a communication surface, lined on the southeast by the above-mentioned wall.

A similar surface area, in this case evidently some kind of boarded floor, which left behind a thin layer of black cinders, spread out on the opposite side of the wall beyond the southwest outer wall of the building (*fig. 13, layer 84*). Both this arrangement of the surface area and the heavy concentration of fragments of cooling vessels, deeply burnt daub, often with a glassy coating, and the ceramic cover of the kiln in this space, suggest that the melting furnace would have been located somewhere nearby. However, it would only be possible to prove definitively that this is where the furnace was located with further field excavations.

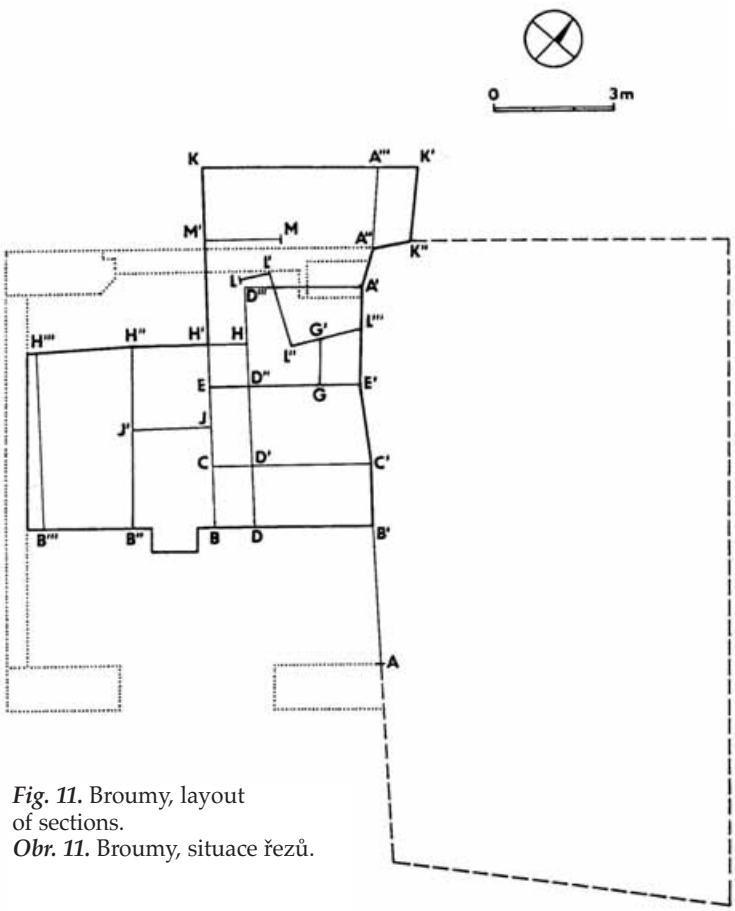

Fig. 11. Broumy, layout of sections.
Obr. 11. Broumy, situace řezů.

On the floor of the building's interior there was a 10-17 centimetre thick layer of light yellow-grey burnt clay and some cinders (*fig. 12, layer 4*). Similar kinds of layers, but with a proportion of quartz sandy or clayey components, or with fragments of brick and stone, were unearthed inside the building above layer 58 (*fig. 13, layers 77, 76, 76a*) and on the opposite side of structure 9/2 (*fig. 13, layers 79, 94, 95, 96, 97, 98*). This context and the burnt clay floor of the interior indicate that the building was destroyed by fire. Some indicators (e. g. the missing, or just very limited, sooting on the inside parts of the tiles, indicating that the stove was used very little; the types of tiles themselves, the use of which – even in this environment – was anachronistic at the end of the 16th century, and all the more so later on; and the absence of trodden layers on the interior floor and of layers beneath the fire horizon outside the interior) point to the conclusion that it was a fire that, according to written records in 1600, destroyed the new glassworks shortly after its completion, and that it was not the result of plundering armies during the Thirty Years War.

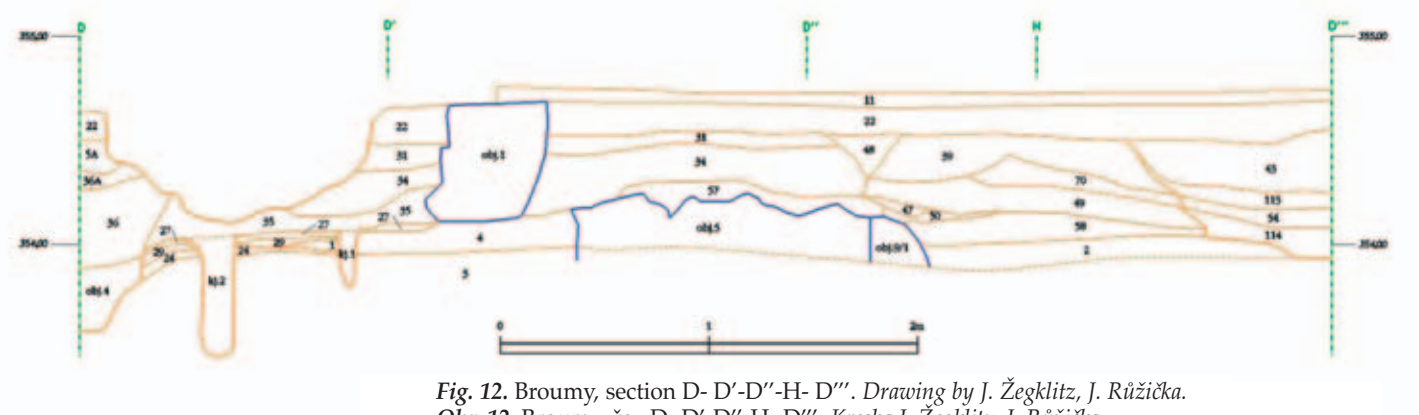

Fig. 12. Broumy, section D- D'-D''-H- D'''. *Drawing by J. Žegklitz, J. Růžička.*
Obr. 12. Broumy, řez D- D'-D''-H- D'''. *Kresba J. Žegklitz, J. Růžička.*

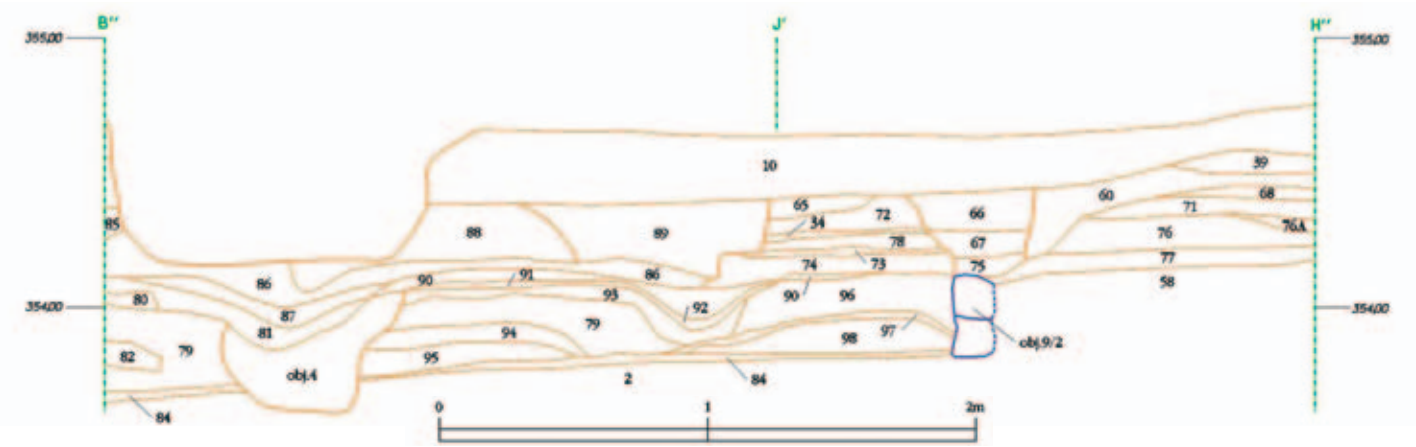

Fig. 13. Broumy, section B''-J'-H''. *Drawing by J. Žegklitz, J. Růžička.*
Obr. 13. Broumy, řez B''-J'-H''. *Kresba J. Žegklitz, J. Růžička.*

The dating of the artefacts drawn from the fire layers does not contradict this hypothesis. The dating of the tile finds was mentioned already above, but here we can just add that despite some archaic decorative elements on their front sides, other minor motifs, particularly the central motif of a vase with a lavishly blooming flower depicted in a square chamber tile (*fig. 7: 2*), or the central bowl-shaped medallion complemented with verdure motifs in the corners of a rectangular tile (*fig. 7: 3*), argue in favour of dating them later in the 16th century (*Pajer 1983*, 106; *Hazlbauer – Špaček 1986*, 157, 160). Similarly, the deep conical chamber of the mantel tiles generally dated to the earlier periods will not be of as much chronological significance here as it will be of a structural one (for details, see *Žegklitz – Hazlbauer – Chotěbor 1992*, 96-100, 106), so there can be no serious objections to dating the stove structure to the very end of the 16th century.

Unlike the tiles which, given the find of the stone base, unquestionably stem from the earliest stage of the glassworks operations, the context with the finds of the other artefacts, mainly kitchen and table pottery and glass, is much more complicated. The very dispersal of the tile fragments, not just with the termination horizon of the building, but also – albeit less extensively – in the superjacent layers, including the layers lying immediately beneath the recent levelling layers under the mortar floor of the recent poultry farm (e. g. *fig. 12, layer 39*), indicates that after the above-mentioned fire there was interference in the terrain, at least locally, at unknown points in time, and at least a part of archaeological material was removed.

Fig. 14. Broumy, selection of ceramics from the fire horizon. 1 – deep bowl (no. B 105, 108, 109, 110, 112, 113 – drawing reconstruction); 2, 4 – fragments of pots (no. B 85, 90, 111, 116; B 112 – drawing reconstruction); 3, 5 – fragments of Saxon stoneware jugs (no. B 90, 112, 115; B 103, 110 – drawing reconstruction); 6 – fragment of a little-used glass melting pan (no. B 108); 7 – fragment of the rim of a bowl (no. B 109); 8 – stoneware box (no. B 105, 108). *Drawings by V. Příhonská, I. Skokanová.*
Obr. 14. Broumy, výběr keramiky z požárového horizontu. 1 – hluboká mísa (přír. č. B 105, 108, 109, 110, 112, 113 – kresebná rekonstrukce); 2, 4 – torza hrnců (přír. č. B 85, 90, 111, 116; B 112 – kresebné rekonstrukce); 3, 5 – torza saských kameninových džbánů (přír. č. B 90, 112, 115; B 103, 110 – kresebné rekonstrukce); 6 – zlomek minimálně použité sklářské tavicí pánve, resp. kelímku (přír. č. B 108); 7 – zlomek okraje misky (přír. č. B 109); 8 – kameninová dózička (přír. č. B 105, 108). *Kresba V. Příhonská, I. Skokanová.*

The problems with obtaining a more exact dating of the termination horizon on the basis of ceramic finds is exacerbated by the negligible amount of ceramic artefacts in these layers and, on top of that, by the considerable fragmentation of the finds, and finally even by gaps in our knowledge about the evolution of Early Modern Czech ceramic production. All these qualifications mean that it is only possible to confirm that the finds from the termination horizon do not conflict with our ideas of the typology, morphology, and decoration of pottery at the turn of the 16th and 17th century. The identifiable fragments are primarily from middle-sized barrel-shaped pots, the rims of which usually were chalice-shaped with inner groove for resting the lid on or were turned and rolled on the outside and equipped with irregularly flat oval handles (*fig. 14: 2, 4*). The majority of the fragments have a transparent glaze on the inside, in the colours customary for that time (various shades of brown, green, and yellow); a relatively large proportion of the fragments are unglazed, a minority of them are fired in reduction atmosphere, smoked, and polished. The decoration is limited to double or multiple horizontal grooves around the neck – in one instance combined with a thin horizontal red painted line – or on the convex edge, or just rarely to a wheel-pressed decoration (a horizontal belt of thickly laid short slanted bands on the neck or multiple narrow waves

Fig. 15. Broumy, fragment of a plate or a flat bowl with painted plant decorations (no. B 66). *Photo by J. Žegklitz.*
Obr. 15. Broumy, zlomek talíře či ploché mísy s malovaným rostlinným dekorem (přír. č. B 66). *Foto J. Žegklitz.*

formed out of tiny prickpoints all over the body – *fig. 14: 2*). In addition to pots, there was also one mid-depth unglazed bowl with a 14 cm diameter and an outwardly rolled rim and rounded walls (*fig. 14: 7*) and one deep bowl glazed in yellow on the outside and with almost flat conic walls, with a lip on the rim, and a double relief horizontal ribbon with a chain decoration (*fig. 14: 1*). The collection as a whole and the individual types of vessels and their decorations do not diverge in any way from the ideas to date about pottery produced around the turn of the 16th and 17th century by potters in Beroun (cf. *Matoušek – Scheufler 1980*; *1983*), who were very likely the main suppliers for the whole wider area of this center renowned for its pottery production. The only exception is one tiny fragment of a plate or flat dish (20 x 24 mm) with light blue engobe and dark blue, yellow-green, and orange-coloured painting beneath the glazing, which is most likely an import from outside the Bohemian lands (*fig. 15*).

Some noteworthy and more easily dated pieces include fragments of two stoneware jugs, decorated all over with narrow horizontal belts of wheel-pressed decorations, in one case also with a pasted decoration in relief (*fig. 14: 3, 5*; drawing reconstruction). In both cases, these are examples of the relatively frequent imports to Bohemia from Waldenburg in Saxony, and the production of similar works is dated to the 1570–80s (cf. *Horschik 1978*, 107). Some small stoneware box for ointment, also originating in Waldenburg, date from even further back in the past, the middle of the 16th century, or even earlier (*Horschik 1978*, 435, cat. nos. 35, 36). The find of one example (*fig. 14: 8*) in Broumy, in a context a half century later, is easily explained by the longevity of these hard-fired, small and, given their purpose, carefully preserved and relatively infrequently used pieces.

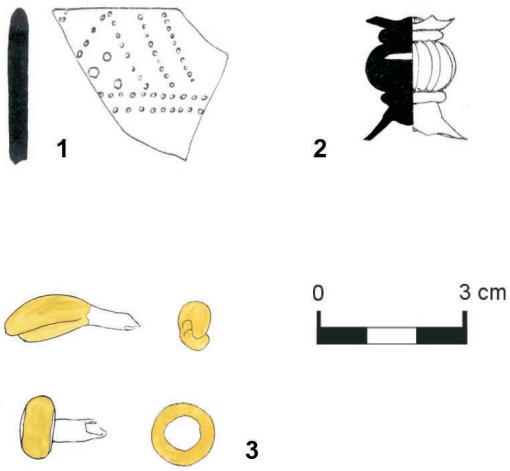

Fig. 16. Broumy, fragments of glass from the fire horizon. 1 – fragment of the rim of a humpen painted in white enamel (no. B 66); 2 – part of a goblet stem with a ribbed node (no. B 110); 3 – two fragments of shaped by hand glass painted in yellow enamel (no. B 90). *Drawing by V. Příhonská.*
Obr. 16. Broumy, zlomky skla z požárového horizontu. 1 – zlomek okraje humpenu s malbou bílým emailem (přír. č. B 66); 2 – část nožky poháru se žebrovaným nodem (přír. č. B 110); 3 – dva zlomky hutně tvarovaného skla s malbou žlutým emailem (přír. č. B 90). *Kresba V. Příhonská.*

Even among the glass finds from the fire layer dating from 1600, there are no fragments that technologically, typologically and in terms of decoration lie more extensively outside this time horizon. Alongside the chronologically insensitive round window discs, the collection of hollow glass contains small pharmaceutical bottles with a semi-spherical body and a long narrow neck, large tetrahedral bottles, a pear-shaped bottle or tankard, goblets and beakers. All of these pieces were made out of a greenish and, at times, almost colourless glass with tiny bubbles in it. Fragments of the tetrahedral bottles and other shapes, not identified further owing to extensive fragmentation, are painted by enamel of various colours (green, yellow, brownish-red, black), the fragment of the rim of a humpen is decorated with a geometric patterns rendered in tiny white enamel dots (*fig. 16: 1*). Evidence of the goblet consists of parts of the stem, made out of a globular, slightly flat node blown into a mould, with vertical ribbing, bordered above and below with a simple ring (*fig. 16: 2*). A similar shape discovered in a collection of finds from Lichtenštejn Palace on Malostranské Square in Prague dates from between the end of the 16th century and the 1640s (*Podliska 2003*, 22, 27), and two almost identical goblets with a ribbed node were found in Rejdice (*Hejdová 1981*), and other similar example is found in an archaeological excavation on Biskupské Square in Olomouc and is dated as coming from the end of the 16th century and is said to have originated in the Netherlands (*Bláha – Drobný – Hlobil – Michna – Sedláčková 1998*, 42).

Probably the most interesting pieces of glass from the 1600 fire horizon are a tiny fragment of a filigree glass, slightly pinkish or purplish, with white, very irregularly criss-crossing fibres, and parts of several rods of colourless or purplish-tinged glass with white fibres, intended for the production of filigree glass – for vessels with both straight (*vetro a fili*) and crossed (*vetro a retorti*) fibres (*fig. 17*). Although Bohemian filigree glass (or filigree glass presumably of Bohemian provenance) dating from earlier periods is also known (the most significant piece identified as produced in Bohemia is the goblet of Georg Pontanus of Breitenberg from 1595 – e. g. *Drahotová 1985*, 62; *Drahotová et al. 2005*, 151; written records provide indirect information about the production of filigree glass at the glassworks in Chřibská already before the beginning of the 17th century, or in Falknov in 1602 – *Hejdová – Drahotová 1989*, 58; *Drahotová et al. 2005*, 143, archive sources also mention the year 1608 in reference to the production of filigree glass in the southern Bohemian glassworks by Vilém Mountain – *Hejdová – Drahotová 1989*, 58), the finds from Broumy are at the very least one of the oldest direct pieces of material evidence of production of this type of glass in the Czech lands. While fragments of filigree glass were found in an archaeological excavation of the deserted glassworks in Rejdice, which was in operation from the 1570s (*Hejdová 1981*, 31), and even in surface survey on the sites of deserted glassworks in Huť u Zásady, Mšeno and Bedřichov (*Hetteš 1963*, 45), however, unlike the glass from Broumy, these finds were not semi-finished products, but just fragments of completed products that need not have been produced at the given site (however their production particularly in Rejdice is very likely) and, unlike Broumy, also the archaeological context did not allow for more exact dating at any of the sites mentioned.

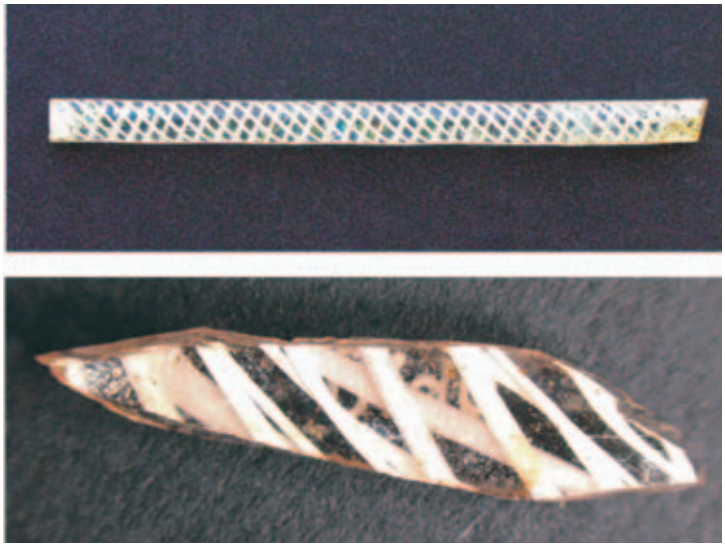

Fig. 17. Broumy, fragments of glass from the fire horizon. Glass rod wrapped around with white fibre for making filigree glass (no. B 111, diameter 4 mm) and a fragment of blown filigree glass (no. B 90, dimensions 29 x 6 mm). *Photo by J. Žegklitz.*
Obr. 17. Broumy, zlomky skla z požárového horizontu. Skleněná tyčinka ovinutá bílým vláknem k výrobě nitkovaného skla (přír. č. B 111, průměr 4 mm) a zlomek dutého nitkovaného skla (přír. č. B 90, rozměry 29 x 6 mm). *Foto J. Žegklitz.*

The final type of glass from the oldest find horizon is represented by two fragments of glass probably shaped by hand and painted with a yellow enamel (*fig. 16: 3*). While they are of no use for a more exact dating of the archaeological context (it is not even clear what purpose they served or what kind of product they may have been a part of), they are relatively rare examples for their time of hand-shaped glass products.

The finds of semi-finished products, completed glass products, and technical ceramics (fragments of used melting pans and small melting pots – see, e. g. *fig. 14: 6*, parts of the covers of the openings to the melting furnaces) indicated that in the short interval between its completion and the fire in 1600, the glassworks experienced a relatively intense stage of production.

However, the building was not rebuilt after the fire. Construction materials and other artefacts from the conflagration site that could still be used were selected and re-used at another place. Construction material was evidently collected from the site even some time after the disaster, as is evident from a trough hollowed out above the northwest outer wall of the building into the stock layers laid earlier with glass refuse and then filled with material of a similar kind (see, e. g., *fig. 13, layers 66, 67, 75*). This at the same time also suggests that the parts of the building above surface level were of bricks – wood

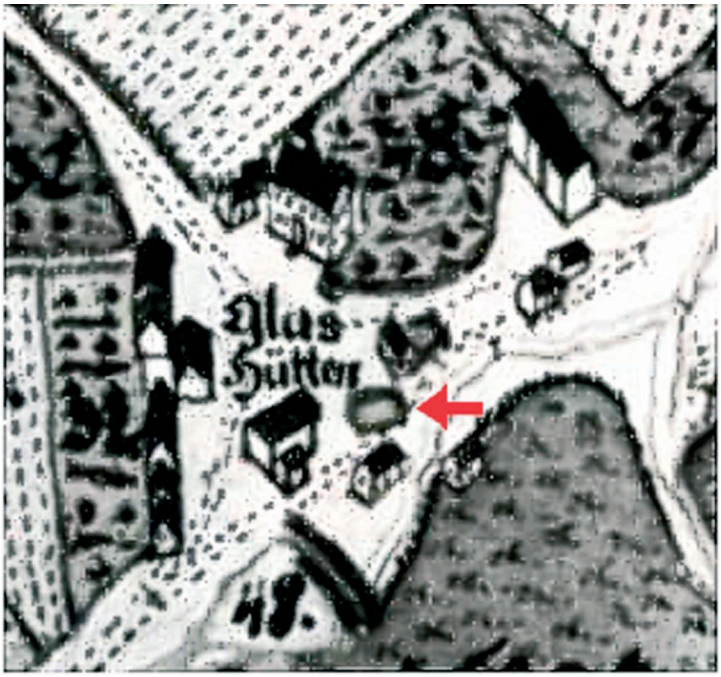

Fig. 18. Map from 1751 – detailed view of the production grounds, the site of the water tank is marked with a red arrow.
Obr. 18. Mapa z roku 1751 – detailní pohled na výrobní areál, místo vodní nádrže označeno červenou šipkou.

would have left behind after the fire a much thicker fire layer, on the contrary it would make no sense to collect the numerous stones, of which there was an abundance in the surrounding area, with such care, and moreover repeatedly, from the conflagration site.

Over the course of ensuing decades, the space of the original building and the area immediately around it were filled with the production refuse from the glassworks and other material (*fig. 12, layers 31, 34, 35, 39, 48, 49, 70*; *fig. 13, layers 34, 39, 60, 65, 68, 71, 72, 73, 74, 78, 80, 81, 85, 86, 87, 88, 89, 90, 92, 93*).

Sometime during the 17th century, a channel was dug out in the already partly-laid refuse layers and water mains were placed in it (*fig. 4, feature 4*; *fig. 13, feature 4*), from which it was possible to unearth both the remains of the wooden pipes and the circular iron joints. Given that the bottom of the channel, ascending toward the west, emptied on the surface on the excavated area (one of the iron joints was found just before the western end of the channel and its more steeply-ascending underside here was filled with stones), it may be that this was refuse from the circular tank, documented, in a plan from 1751, at a point between three buildings at the centre of the production area of the glassworks (*fig. 18*).

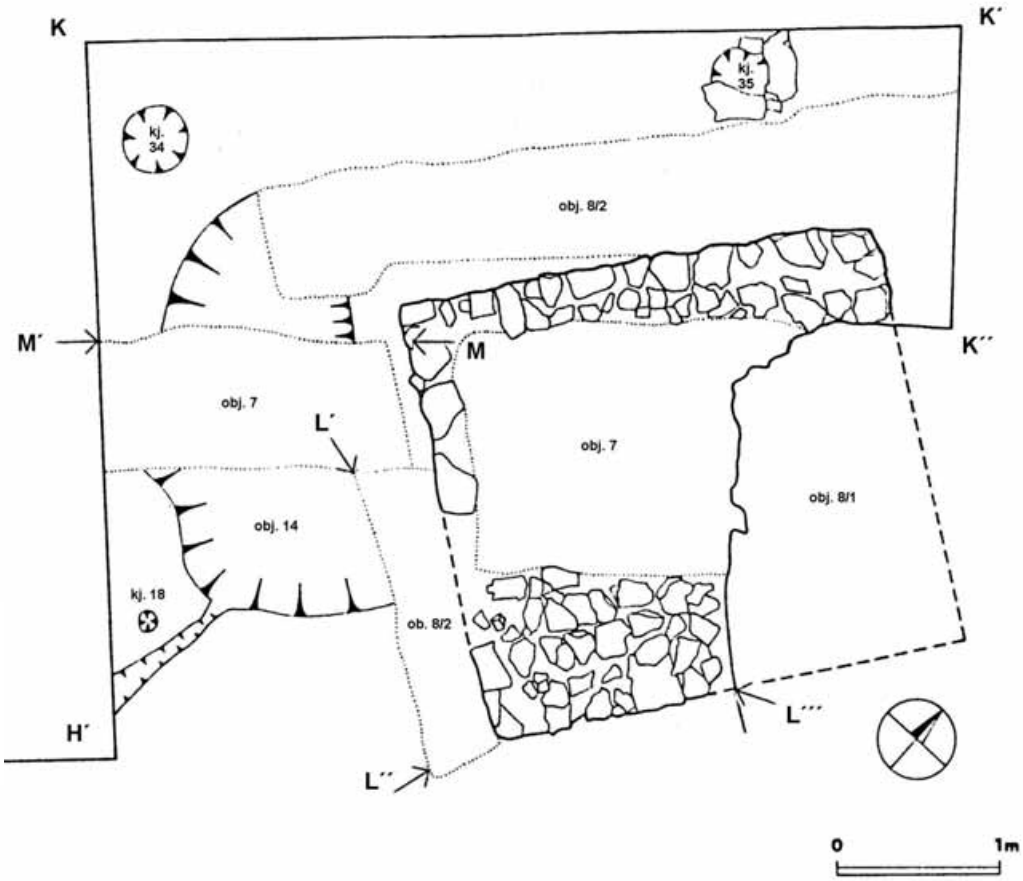

Fig. 19. Broumy, production plant (furnace) – early phase. *Drawing by J. Žegklitz.*
Obr. 19. Broumy, výrobní objekt (pec) – starší fáze. *Kresba J. Žegklitz.*

- 2.1.2 Production equipment

Direct adjacent to the building, a structure was uncovered with a rectangular ground plan, turned along its longer axis parallel to the northwest outer wall of the building. The excavation managed to document its two phases.

The older phase, stratigraphically dated to the same period as the adjacent building, was represented by the lower part of the structure with an almost square ground plan (295 x 270 cm, height preserved above the level of the then surrounding terrain 11-60 cm), built of stone bonded, like the stove base, with yellow clay (*fig. 4, feature 8/1; fig. 19*). Given that the eastern corner of the structure was dug away during excavating of a building pit and most of the inside part was destroyed by the later foundation walls of the barn (*fig. 19, feature 7*), it is not possible to report anything specific about the structure of its higher parts above ground level, or the interior space. Given that a pit was excavated in front of its southwest wall somewhat off axis, and was filled with layers containing a considerable amount of cinders and in places just layers

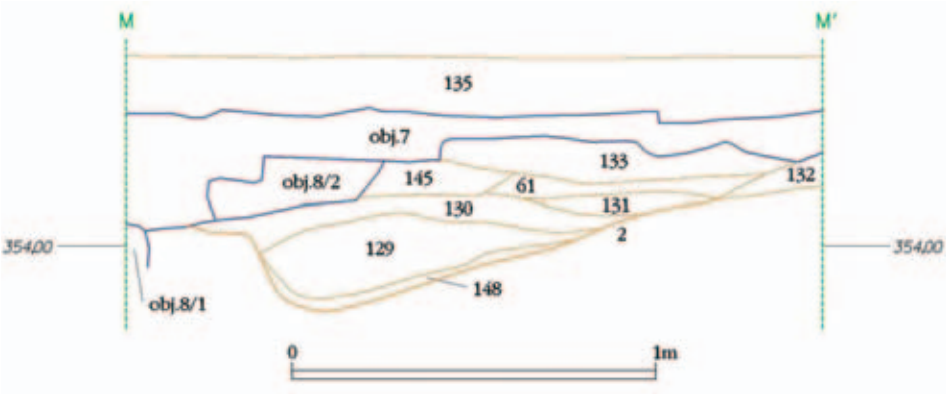

Fig. 20. Broumy, section M-M'.
Drawing by J. Žegklitz, J. Růžička.
Obr. 20. Broumy, řez M- M'.
Kresba J. Žegklitz, J. Růžička.

of ash (*fig. 19, feature 14; fig. 20, layers 148, 130*), it is certain that this was a production building where work was done with fire, that is, a furnace. A layer of brick rubble reaching below the later extension of this structure (*fig. 20, layer 129*) suggests that in the construction of the furnace in the earlier stage bricks, as well as stones, may have been used. Two post-holes excavated not too deeply into the soil horizon next to the northwest wall of the furnace (*fig. 19, post-holes 34, 35*) are most likely the remains of its roofing.

This structure was also damaged in the above-mentioned fire. Unlike the adjacent residential building, it was however rebuilt – 50-90 centimetres thick wall from stones bonded with light-brown clay was built on the northwest and southwest (and probably also the northeast) wall and it had massive boulders in the front corners and the occasional bricks (*fig. 19, feature 8/2; fig. 21*). In its central part, the bottom of the furnace was filled with two layers of rectangular bricks. As the foundation walls of the barn interfere with the site,

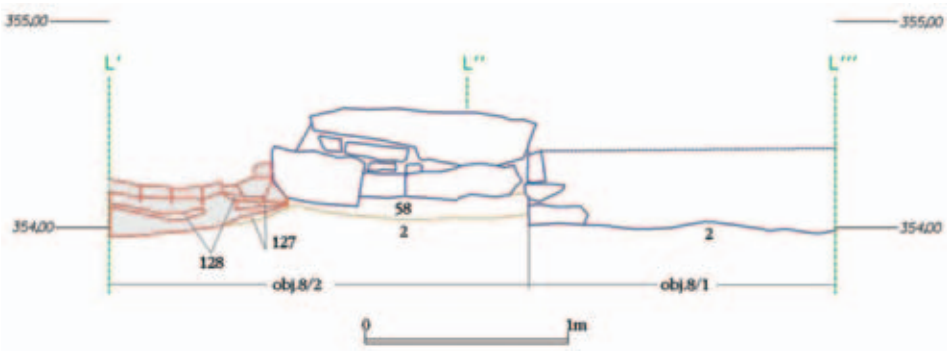

Fig. 21. Broumy, section L'-L''-L'''.
Drawing by J. Žegklitz, J. Růžička.
Obr. 21. Broumy, řez L'-L''-L'''.
Kresba J. Žegklitz, J. Růžička.

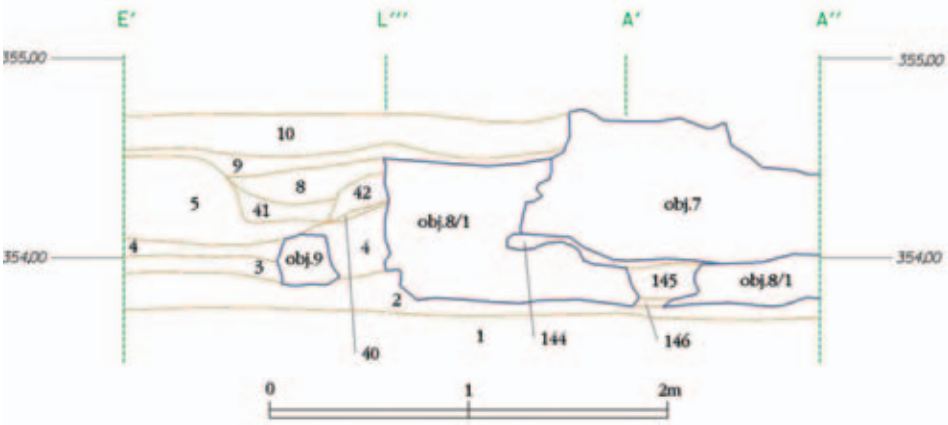

Fig. 22. Broumy, section E'-L'''-A'-A''. *Drawing by J. Žegklitz, J. Růžička.*
Obr. 22. Broumy, řez E'-L'''-A'-A''. *Kresba J. Žegklitz, J. Růžička.*

it is unfortunately not possible to determine the full size of the brick-paved surface; however, the preserved remains indicate that this probably was not a heating channel, but instead a bottom of a working space, and the narrow heating flue, today filled with layers of burnt clay, ran through its centre (*fig. 22, layers 145, 146*). Before the front wall of the furnace, there was a forehearth pit (belonging to the earlier stage of the furnace) and another area paved with bricks and bordered with large, flat stones set on their edges, abutted the western corner (*figs. 23, 24*) – this was evidently some kind of pathway used for moving around the furnace, or between it and the surrounding buildings.

Given the amount of interference in the structure owing to the recent building pit and especially the earlier-laid foundation parts of the outer wall of the barn, built here sometime after the middle of the 18th century in connection with the conversion of the glassworks into a farm, it is difficult to determine exactly what purpose it served. The masonry remains are heavily burnt and this and the layers of ash and cinders in the foreherth pit are evidence of work with fire, but the complete absence of any remains of glass, the size of the furnace, and the cramped manoeuvring space around it – considering its location immediately adjacent to the residential building – also rules out the possibility that this was a main melting furnace. Therefore, the most likely hypothesis

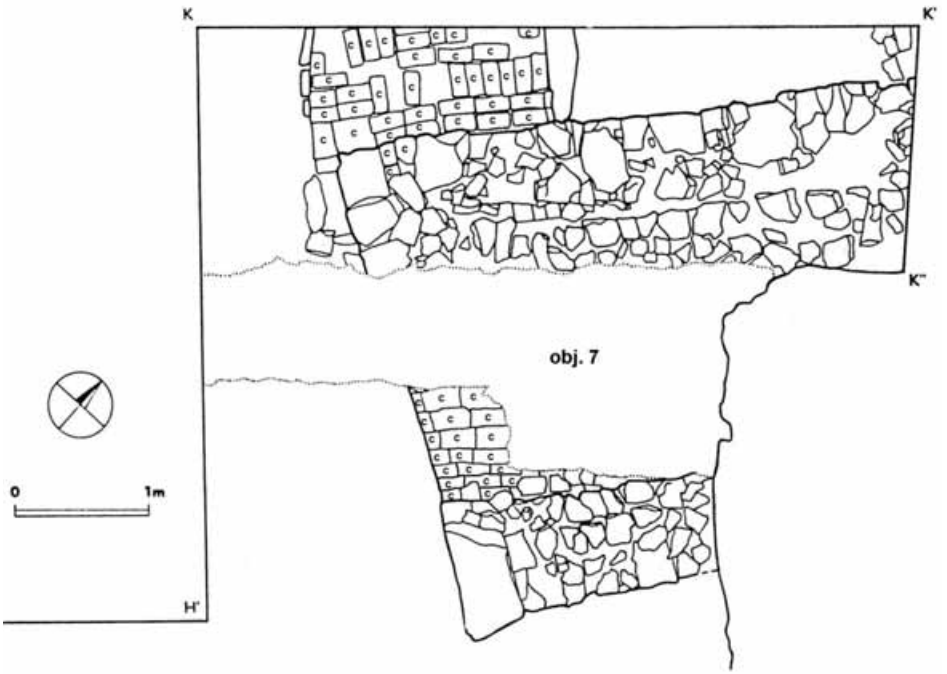

Fig. 23. Broumy, production plant (furnace) – later phase. *Kresba J. Žegklitz.*
Obr. 23. Broumy, výrobní objekt (pec) – mladší fáze. *Kresba J. Žegklitz.*

seems to be that it was some type of auxiliary furnace, and there is abundant archaeological evidence (cf. e. g. *Černá 2000*, 31-33; *Černá 2004*, 36-37; *Hejdová 1981*, 22-24; *Kaván 1982*; *Charleston 1978*, 25-26; *Kurzmann 2004*, 49-158; *Lang 2001*, 42-58) and iconographic records (*fig. 25*) that such existed at glassworks. Their specific function has, however, been more difficult to determine even in the case of relatively well-preserved examples; in the case at hand, several interpretations suggest themselves – it may have been a warming furnace, used to heat the melting pans before they were placed in the melting furnace, or a muffle kiln, used to fire the enamel on painted products. It seems less likely that it was a frit kiln, in which frit was prepared (a partly melted-through, non-homogeneous mixture of sand and alkaline ingredients which, after cooling, was crushed and then melted again); the degree of burning of the preserved parts of the interior of the furnace and the complete absence of any trace of glass however seem at odds with this possibility (cf. *Hejdová 1981*, 23). However, the possibility cannot be ruled out even that it was a roaster, used to heat the quartz, on which water was then poured and the cracked small pieces were crushed into a glass batch; although there was an adequate supply of sand in the immediate area around the glassworks, the finds of pieces of white quartzite melted on the surface indicate that the glassworks used even these materials, deposits of which were located to the south and southwest of Broumy close to Kublov (see *fig. 2*). The final possibility is that it was a annealing furnace; at that time, this kind of furnace was often used as part of the main melting furnace and made use of its "waste" heat (see, e. g., *figs. 25, 26*; *Kaván 1982*, 30), but descriptions exist of an annealing furnaces standing outside the main furnace as a separate structure with its own

Fig. 24. Broumy, production plant (furnace) – view from the southwest. Top – layout of the younger stage with the brick landing on the left, below – state after the removing of foundation masonry of the barn, with a clearly visible joint after building on the outside screen to the northwest wall of the furnace.
Photo by J. Žegklitz.
Obr. 24. Broumy, výrobní objekt (pec) – pohled od jihozápadu. Nahoře situace mladší fáze s cihlovou podestou vlevo, dole stav po vybrání základového zdiva stodoly s dobře patrnou spárou po přizdění vnější plenty k severozápadní stěně pece.
Foto J. Žegklitz.

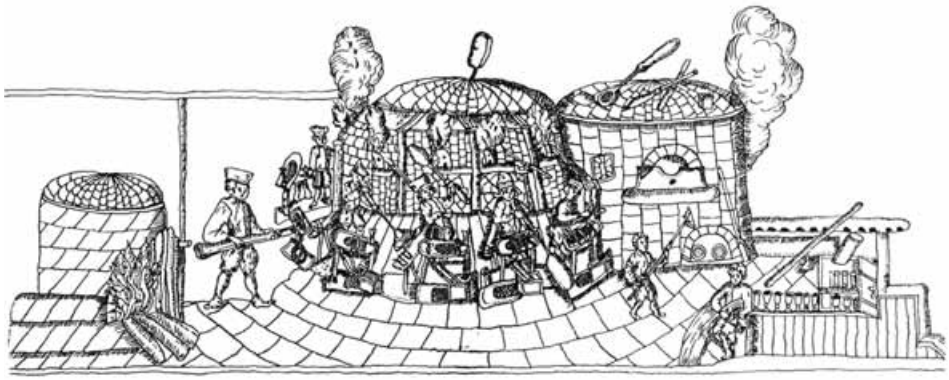

Fig. 25. Glassworks of Johann Christoph Preussler in Weissbach – main melting and annealing furnace, including the cooling vessels, auxiliary furnace on the left. Drawing based on a painting on a lost, painted Silesian beaker from 1727. Reproduced from the book by *O. Drahotová* (*2005*, 512).
Obr. 25. Sklářská huť Johanna Christopha Preusslera ve Weissbachu – hlavní tavicí a chladicí pec včetně chladicích nádob, vlevo pec pomocná. Kresba podle malby na ztracené malované slezské číši z roku 1727. Reprodukováno z knihy *O. Drahotové* (*2005*, 512).

Fig. 26. Humpen painted with enamel with a view of the glassworks in Zeilberg from 1680 (a gift from the head of glassworks Christian Preussler to Caspar Steiner of Volpersdorf). Detail of the main melting furnace with a cooling space and cooling vessels, the melting section of the furnace on the left. From the collection of the Museum of Decorative Arts in Prague, inv. no. 9918. *Photo by G. Urbánek.*
Obr. 26. Emailem malovaný humpen s pohledem na sklářskou huť v Zeilbergu z roku 1680 (dar huťmistra Christiana Preusslera Casparu Steinerovi z Volpersdorfu). Detail hlavní sklářské pece s chladicím prostorem a chladicími nádobami, tavicí část pece vlevo. Sbírka Uměleckoprůmyslového musea v Praze, inv. č. 9918. *Foto G. Urbánek.*

the forehearth pit that was clearly repeatedly scooped out, whereby it disturbed the layers of refuse placed in its immediate environment since the 1600 fire over the course of the second half of the 17th century (see *fig. 12* – in refuse layers 49, 70, and 38 the forehearth pit is excavated, filled with layers 114, 54, 113 and 43).

The building development in the excavated part of the grounds of the glassworks came to an end with the construction of the farm building, probably in connection with the conversion of the defunct glassworks into a farm in the second half of the 18th century. Around the middle of the 20th century, the barn building was renovated into a poultry farm (*Psota 1958*, 433), its interior was divided by three partition walls, the foundations of which were laid in the layers of refuse from the glassworks (*fig. 12, feature 1*), and levelled by adding a layer of earth, up to 30 cm thick in places (*fig. 12, layer 22*; *fig. 13, layer 10*), on which a concrete floor was laid (*fig. 12, layer 11*).

2.2 Movable finds

Regardless of whether it is pottery, glass, or other materials, the classification and relative dating of artefacts from refuse layers deposited after the fire in 1600 is limited by two main factors.

The first is the extreme fragmentation of the finds, which makes it almost impossible to reconstruct their original shapes in full – both in the case of ceramic and glass products – and consequently it is much harder to obtain an idea of the assortment of goods produced by the glassworks. The nature of the material, including the fact that we find fragments from the same vessels repeatedly in several different layers, also makes it seem that in at least some cases the site where the excavation took place is not where the fragment was initially deposited, but rather it was redeposited there from somewhere else. This, of course, has also a negative influence on trying to determine a relative chronology, which is moreover complicated by the above-mentioned secondary interference in the already deposited layers that clearly occurred during attempts to obtain construction material left on the site after the fire in 1600.

In any case, it seems that, although the glassworks operated until the start of the 1740s, the excavation did not unearth any material later than from the end of the 17th century. An explanation may be that, at the time, the site ceased to be used for depositing refuse, or after the middle of the 18th century the ground was artificially lowered and levelled prior to the construction of the barn, and the older layers were consequently removed and deposited elsewhere in the surrounding area.

Archaeological finds can be divided into three basic groups: a) standard utility ceramics, used in the households of the employees of the glassworks, b) production tools, including technical ceramics, c) glass products, semi-finished glass, and production refuse.

Fig. 27. Broumy, ceramics from the refuse layers from the 17th century. 1 – fragment of the bottom of an stoneware jug, Westerwald (no. B 170); 2 – fragment of a bowl on a bell-shaped foot (no. B 107); 3 – tile fragment with a plant motif (no. B 160); 4, 5 – fragments of stoneware jugs, Waldenburg (no. B 62, B 115); 6 – fragment of the bottom of a plate or flat bowl decorated with marbling (no. B 130); 7 – fragment of the rim of a plate with blue painted decorations (no. B 28); 8, 9, 10 – fragments of a pipe stem (no. B 20, B 114, B 84); 11 – bowl of a green-glazed pipe (no. B 196). *Drawing by V. Příhonská, I. Skokanová.*
Obr. 27. Broumy, keramika z odpadních vrstev 17. století. 1 – zlomek dna kameninového džbánu, Westerwald (přír. č. B 170); 2 – zlomek mísy na zvonovité patce (přír. č. B 107); 3 – zlomek kachle s rostlinným motivem (přír. č. B 160); 4, 5 – zlomky těl kameninových džbánů, Waldenburg (přír. č. B 62, B 115); 6 – zlomek dna talíře či ploché mísy zdobené mramorováním (přír. č. B 130); 7 – zlomek okraje talíře s modrým malováním (přír. č. B 28); 8, 9, 10 – zlomky troubelí dýmek (přír. č. B 20, B 114, B 84); 11 – hlavička zeleně glazované dýmky (přír. č. B 196). *Kresba V. Příhonská, I. Skokanová.*

- 2.2.1 Ceramics

Ceramics obtained from refuse layers comprise a standard assortment of kitchen and tableware: pots of all sizes, deep bowls, flat bowls, plates and jugs; among the types usually found in other collections, there were surprisingly no pans in this case. A less commonly found shape is a fragment, probably of a bowl, on a hollow bell-shaped stem, glazed on both sides, and with greenish-brown marbling on the outside (*fig. 27: 2*).

The pots are no different in shape from the pieces from the fire horizon: barrel-shaped pieces with rims folded back and rolled outward, or with a chalice-shaped rim for the lid to rest on. A relatively large number of fragments that come from pots are unglazed, in other cases there is an inner led glaze of yellow, green, and brown shades or mixtures of them. Decorations are usually limited to horizontal grooving on the neck and red painting, or both in combination. Wheel-pressed decoration occurs rarely (e. g. *fig. 28: 7*) and in one case there is a horizontal, vertically cut moulding just below the rim (*fig. 28: 9*). Several fragments fired in reduction atmosphere and polished also probably come from pots.

Owing to the extensive fragmentation, the other shapes cannot be described in any detail. In terms of decoration, some painted fragments stand out from the average: these include a jug and a flat bowl or plate coming under the Beroun red group, and perhaps a fragment of a flat bowl or plate coming under the Beroun white group (see *Koula 1917-19*, 250-257; *Scheufler 1972*, 111-112), or a fragment decorated with brownish-green marbling and two concentric grooves around the periphery of the outside of bottom (*fig. 27: 6*). A fragment of the rim of a plate was also found, made of white clay, painted in blue and covered with a transparent lead glaze (*fig. 27: 7*), which could be ranked among the group of ceramic goods that J. Koula called "Prague" ceramics, the production of which dates back to the second half of the 17th century (*Koula 1917-19*, 14-16; *Scheufler 1972*, 108). The only fragment that, owing to its tiny size, cannot be assigned any specific shape is a piece with pasted decoration.

Some more noteworthy finds, dated on the basis of accessory material to the 17th century, include a fragment of a shallow bowl with a wavy rim turned

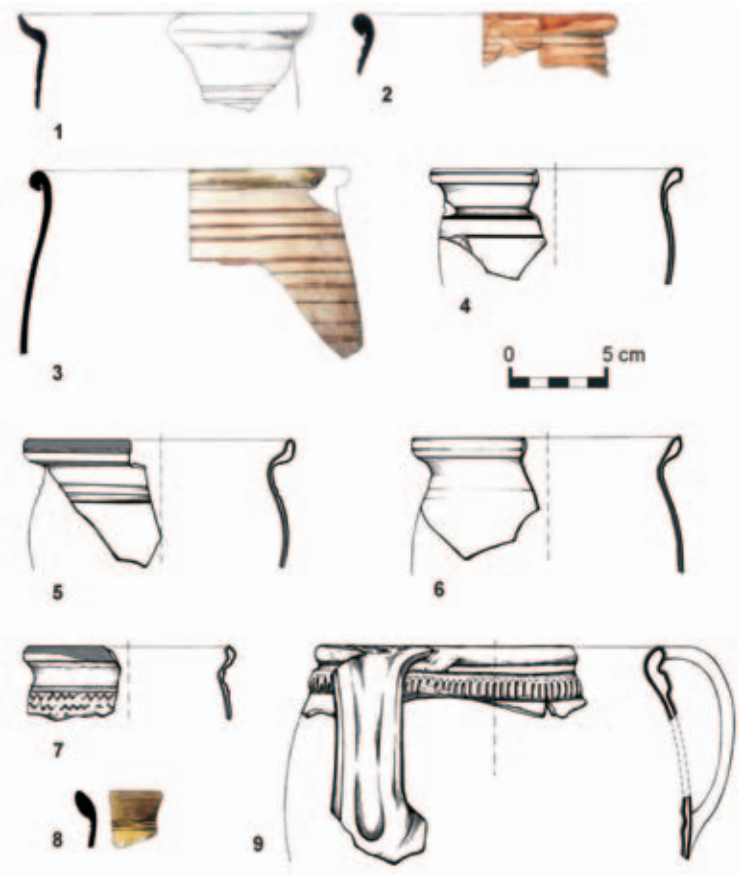

Fig. 28. Broumy, ceramics from the refuse layers from the 17th century. Fragments of pot rims (nos. B 87, B 104, B 104, 107, B 142, B 108, B 139, B 103, B 130, B 125). *Drawing by V. Příhonská, I. Skokanová.*
Obr. 28. Broumy, keramika z odpadních vrstev 17. století. Zlomky okrajů hrnců (přír. č. B 87, B 104, B 104, 107, B 142, B 108, B 139, B 103, B 130, B 125). *Kresba V. Příhonská, I. Skokanová.*

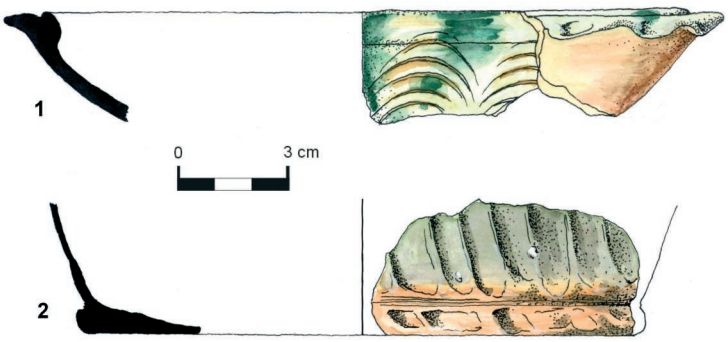

Fig. 29. Broumy, ceramics from the refuse layers from the 17th century. 1 – part of the rim of a flat bowl (no. B 129); 2 – fragment of the bottom of a deep bowl (no. B 129). *Drawing by V. Příhonská.*
Obr. 29. Broumy, keramika z odpadních vrstev 17. století. 1 – část okraje mělké mísy (přír. č. B 129); 2 – zlomek dna hluboké mísy (přír. č. B 129). *Kresba V. Příhonská.*

outward, decorated on the inside with engraved columns of semi-circles and with a marbled yellow-green glaze (*fig. 29: 1*), as well as the bottom of a glazed deep bowl with a finger-pressed decoration on the base and with wide vertical grooves on the outside of body (*fig. 29: 2*).

Alongside earthenware, also other types of ceramics were found. Stoneware, again originating in Saxon Waldenburg, is represented by fragments of jugs decorated with horizontal belts of wheel-pressed decoration (*fig. 27: 4, 5*), or just with horizontal grooving. Not too common in the Czech lands is the find of a fragment of the lower part of a stoneware jug made of grey clay with a pronounced foot decorated with stylised plastic plant motifs and in places with cobalt glaze (*fig. 27: 1*), the origin of which must be sought in the Rhine region, specifically in some production centres around Westerwald; given the small size of the fragment and the fragmentary nature of its decoration it is difficult to date it with much accuracy, but based on analogies it seems likely to have originated in the second half of the 17th century (*Gaimster 1997*, 251-271). Equally unusual is the find of a fragment of what was evidently a spherical jug, with a white faience glaze on both sides; this is a Moravian Anabaptist product dating from no later than the 1620s.[1)]

Alongside kitchen and tableware, the refuse layers turned up several fragments of tiles, again dated from sometime in the 17th century. The only more remarkable piece among them is the fragment of the front side of a unglazed tile with a stylised plant decoration, maybe the so-called "wallpapering" design (*fig. 27: 3*).

The final type of ceramic product, which does not fall under the category of technical ceramics, is lay pipes, parts of which were found at the site. One piece of a pipe-stem has a light-green lead glaze (*fig. 27: 9*), one of the other two, made of soft white clay, bears a relief decoration in the form of three-leaf twigs joined at the bottom and branching out at the top (*fig. 27: 10*). The only pipe bowl found has a subtle wheel-pressed decoration on its lower part and is covered with a green lead glaze (*fig. 27: 11*). The production of this type of pipe is identified as coming from the Central European and probably Czech domestic environment in the second half of the 17th century (*Vyšohlíd, in print*), but it is possible that some finds originated already in the first half of that century (*Frolík – Žegklitz 1988*).

Note 1:
I would like to thank PhDr. Jiří Pajer, CSc., for his consultation.

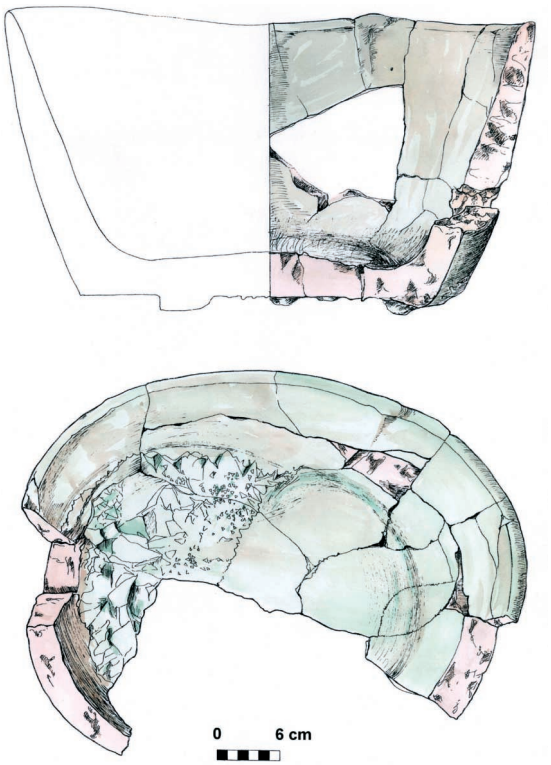

Fig. 30. Broumy, large melting pan (no. B 113).
Drawing by V. Příhonská.
Obr. 30. Broumy, velká tavicí pánev (přír. č. B 113).
Kresba V. Příhonská.

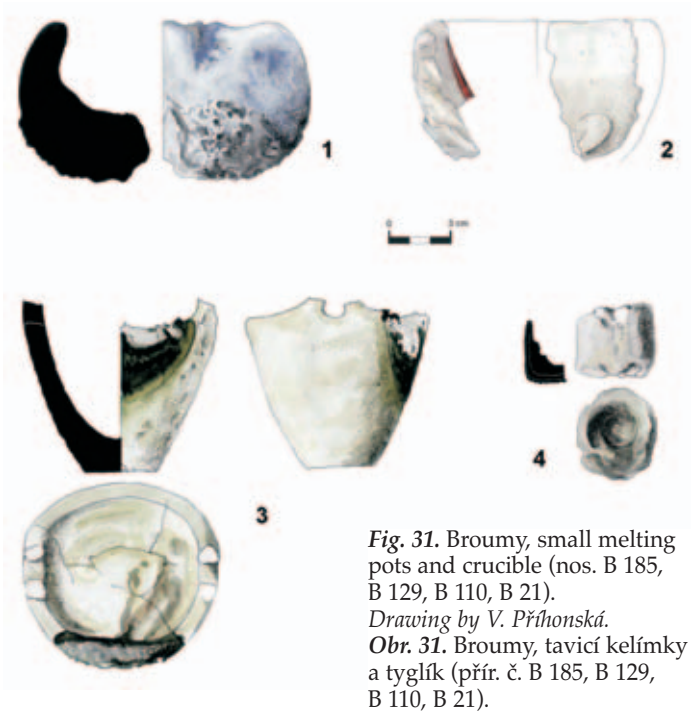

Fig. 31. Broumy, small melting pots and crucible (nos. B 185, B 129, B 110, B 21).
Drawing by V. Příhonská.
Obr. 31. Broumy, tavicí kelímky a tyglík (přír. č. B 185, B 129, B 110, B 21).
Kresba V. Příhonská.

- 2.2.2 Production tools

Like at the majority of sites of this kind, in Broumy the most common finds in the category of production tools are fragments or whole pieces of melting vessels – large pans, crucibles and small fire pots.

The largest piece of an identifiable size is a substantial part of a large melting pan with flat walls spreading out towards the top and with a circular, somewhat elliptically deformed rim, 25.5 cm in height and a diameter across the length of the ellipse measuring 47.5 cm, covered on both sides with a coat of greenish glass (*fig. 30*). Large pans of a similar size, of which a considerable number of fragments were found, were used to melt the basic clear or greenish glass that was most commonly used. An exception is the fragment of a large pan (the thickness of the wall of the preserved fragment measured 35 mm, the diameter of the rim measured at least 35 cm), covered on both sides with a coat of blue glass melt; this find indicates that a considerable amount of cobalt glass was produced in Broumy.

Melting pans and crucibles of medium and smaller sizes (the largest diameters being between 10-14 cm and heights of 10 cm), with both flat and rounded walls, were usually used to produce coloured glass primarily intended for decoration, so the quantity was smaller. Among the finds in Broumy are a crucible for melting a basic greenish glass, with two opposite handles protruding vertically from the rim which, in combination with the metal pole, were used to remove the object from the furnace using metal rods (*fig. 31: 3*), along with pans with the remains of cobalt (*fig. 31: 1*) and red opaque glass (*fig. 31: 2*).

The smallest piece found that was used for melting glass is a small pot (34 mm in height, at its widest 44 mm in diameter – *fig. 31: 4*). Given that it was wrapped on all sides with a thick layer of greenish glass, it would not have been used to make any special kind of glass, but instead it was probably used to help in testing.

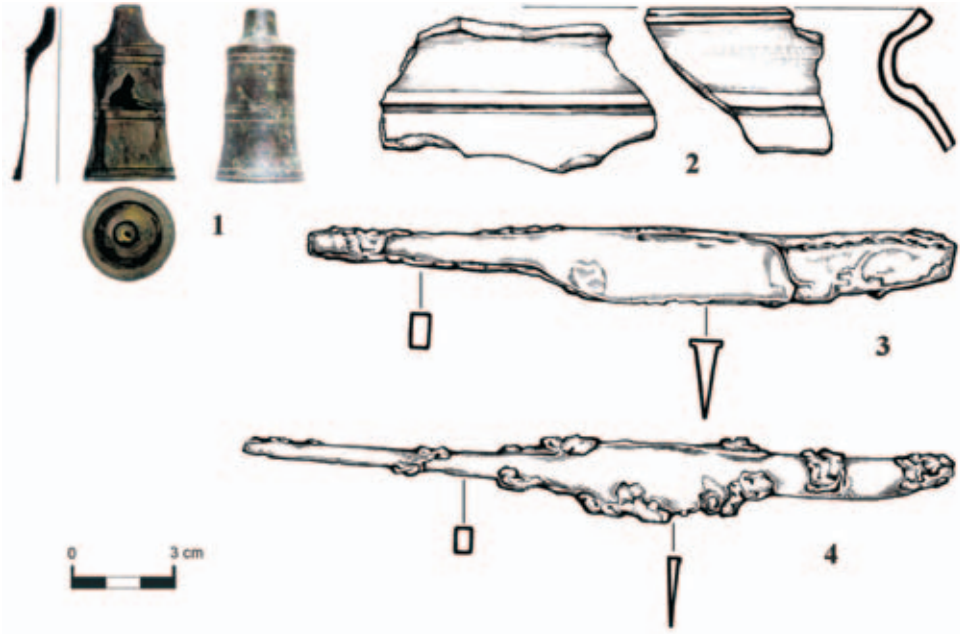

Fig. 32. Broumy, production tools. 1 – bronze blowpipe mouthpiece (no. B 103); 2 – fragment of a cooling vessel (no. B 149); 3, 4 – iron knives (no. B 95). *Drawing by I. Skokanová, V. Příhonská, photo by J. Žegklitz.*
Obr. 32. Broumy, výrobní nástroje. 1 – bronzový náústek píšťaly (přír. č. B 103); 2 – zlomek chladicí nádoby (přír. č. B 149); 3, 4 – železné nože (přír. č. B 95). *Kresba I. Skokanová, V. Příhonská, foto J. Žegklitz.*

The basic working tools used by glassmakers included blowing pipes. Examples of these in the collection of finds are some heavily corroded iron pipes and a unique bronze mouthpiece in the shape of an elongated bell, 49 mm in height and with a diameter of 25 mm across the bottom part, decorated with a pair of double narrow horizontal lines and another three narrow horizontal lines (*fig. 32: 1*). Two heavily corroded iron knives can also perhaps be included in the category of working tools (*fig. 32: 3, 4*).

Fig. 33. View of the cooling vessels with glass products in the annealing furnace during experimental melting of glass in a replica of a mediaeval furnace in Moldava in Krušné hory. *Photo by J. Žegklitz.*
Obr. 33. Pohled na chladicí nádoby se skleněnými výrobky v chladicí peci při experimentální tavbě skla v replice středověké pece na Moldavě v Krušných horách. *Foto J. Žegklitz.*

In addition to pans, other examples of technical ceramics are the fragments of thin-walled cooling vessels, made of brownish-red clay with a 30 cm diameter across the rim (*fig. 32: 2*), used to protect finished glass products against any direct flames or smoke while they were slowly and gradually cooling in the annealing furnace and then outside the furnace (*figs. 25, 26, 33*).

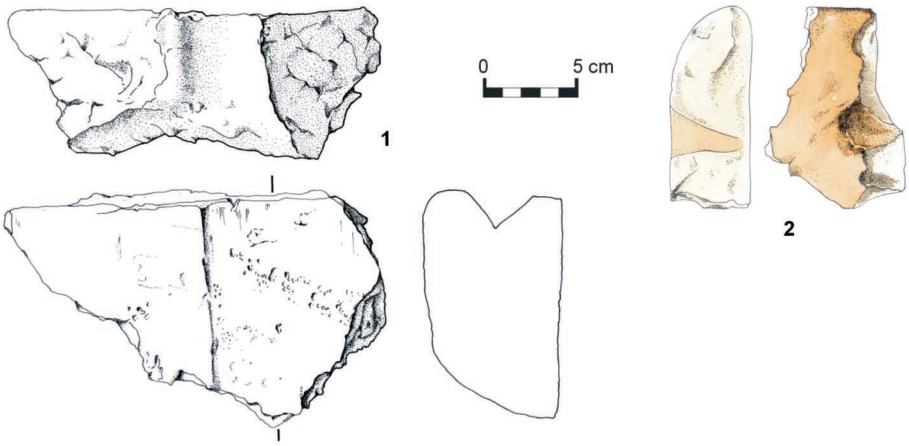

Fig. 34. Broumy, fragments of ceramic covers for the working openings of the melting furnace (no. B 65, B 198). *Drawing by V. Příhonská*
Obr. 34. Broumy, zlomky keramických krytů pracovních otvorů tavicí pece (přír. č. B 65, B 198). *Kresba V. Příhonská*

The final type of find classified under working tools or equipment are the ceramic covers for the openings of the furnace through which the melting space of the furnace was reached. Fragments were found of the covers for the openings through which melted glass was drawn (both used covers – heavily overfired with a coat of glass on the inside – and unused ones, and in both cases with a small circular opening in the middle so that they could be handled with a metal rod – *fig. 34: 2*), and a fragment of the cover of a large handling opening of the furnace (perhaps for inserting pans) with a large circular opening and a rabbet around the periphery for fitting it firmly in place (*fig. 34: 1*)

- 2.2.3 Glass

Types of glass

Information about the variety of glass produced could be drawn from the completed products and from the remains of raw glass or glassing on the melting vessels.

Alongside the prevailing type of colourless glass, tinted in various shades of green probably owing to impurities (iron oxides), the second most common type is dark blue glass (cobalt). As already mentioned, a large amount of this type of glass was produced in Broumy, as the fragment of a large melting pan containing the remains of this glass shows. In addition to the coat found on even the smaller pans and crucibles (e. g. *fig. 31: 1*) and over and above the large pieces of raw glass, there are whole pieces made out of this type of glass among the finds, and it is present in the form of fibres used to decorate colourless glass.

Tab. 1: The chemical composition of selected samples of glass (semi-quantitative content, in %).[2)]

	sample 1a	*sample 1b*	*sample 2a*	*sample 2b*	*sample 3a*	*sample 3b*	*sample 4*
Na_2O	5,36	5,68	1,87	6,83	2,73	4,23	11,71
K_2O	10,15	9,94	12,04	2,34	17,21	12,96	5,16
CaO	8,05	8,69	11,37	2,22	15,94	14,34	13,44
SiO_2	66,78	66,25	69,18	39,26	60,11	56,64	58,35
Al_2O_3	2,20	1,83	1,41	1,01	-	0,65	4,28
MgO	3,36	3,07	2,58	1,36	2,05	2,01	2,49
P_2O_5	3,53	4,27	1,19	-	0,75	0,67	0,80
FeO	0,31	0,27	-	-	-	1,86	1,49
CuO	-	-	-	-	-	0,72	0,98
SnO_2	-	-	-	19,92	-	3,06	-
TiO_2	-	-	-	-	0,38	0,44	0,50
MnO	0,26	-	0,36	-	0,83	0,77	0,80
PbO	-	-	-	27,06	-	1,65	-

sample 1a, b – opal, opaque white, slightly blue-green coloured raw glass (B 79)
sample 2a – rod for the production of filigree glass, colourless core (B 111)
sample 2b – rod for the production of filigree glass, opaque white fibre (B 111)
sample 3a – rod for the production of filigree glass, colourless core (B 150)
sample 3b – rod for the production of filigree glass, red fibre (B 150)
sample 4 – imperfectly melted-through raw glass – dark green with layers of glass in the colour of sealing wax, red layer (B 151)

The remains in the melting pots, the pieces of raw glass, and the fragments of completed products also indicate that red opaque glass was produced (glass with the colour of sealing wax, stained with copper, so-called Welschrot – see *fig. 31: 2*; *tab. 1, sample 3b, 4*) and white opaque glass (tin opal, coloured with tin oxide – see *tab. 1, sample 2b*). The finds of raw glass testify to the production of glass in light and dark purple (coloured with compounds of manganese, usually manganese ore), brown, transparent blue-green, and finally opal glass (milk-coloured – so-called "koštěnka"), opacified – with regard to the high content of phosphor – evidently by bone ash (see *tab. 1, sample 1*). The find of a rod of colourless glass with a yellow "core" would seem finally to suggest that glass of this colour was produced; however, it is more likely that in this case it is not actually yellow glass as such, but enamel (for details, see below).

Note 2:
A micro-analysis was conducted in the Laboratories of the Geological Institutes at the Faculty of Natural Sciences, Charles University, in Prague, on 12 September 2006, using a CamScan S4 – Link ISIS 300 EDX, by the analyst R. Procházka. The sensitivity limit approx. 0.2 %. The measured values of the indicated elements adding up to 100% whilst maintaining proportional ratios.

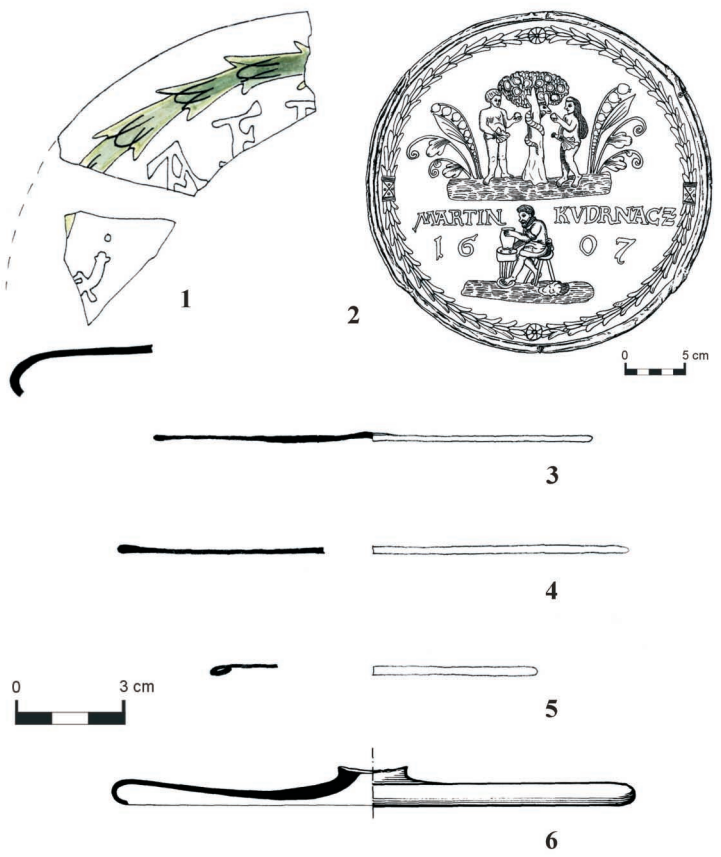

Fig. 35. Broumy, glass from the refuse layers from the 17th century. Window glass. 1 – fragments of a window discs painted with enamel (no. B 51); 3, 4, 5 – various types of window discs (no. B 98, B 120, B 150); 5 – remainder of a parison after making a window disc using method B (no. B 89, cf. *fig. 36*); 2 – window disc painted with enamel, from the Church of St. James the Great in Beroun. *Drawing by V. Příhonská, J. Škvainová, I. Skokanová.*
Obr. 35. Broumy, sklo z odpadních vrstev 17. století. Okenní sklo. 1 – zlomky emailem malovaného okenního terče (přír. č. B 51); 3, 4, 5 – různé typy okenních terčíků (přír. č. B 98, B 120, B 150); 5 – zbytek baňky po výrobě okenního terčíku způsobem B (přír. č. B 89, srv. *obr. 36*); 2 – emailem malovaný okenní terč z berounského kostela sv. Jakuba Většího. *Kresba V. Příhonská, J. Škvainová, I. Skokanová.*

Products – typology, morphology, decoration

a) Flat glass

Written records and archaeological finds in Broumy both testify to the extensive production of window glass, from the very moment the glassworks began operating in 1600 (see *fig. 9*). The collection of finds contains a considerable number of fragments of window discs and the remains of their production; the remains of other types of flat glass were not recorded in the excavation.

The majority of window discs are made out of green glass, only rarely out of almost colourless glass. The rims are both simple (*fig. 35: 3, 4*) and folded over (*fig. 35: 5*). The diameters were in the range of 9-14 cm, an exception is a fragment painted in enamel with a diameter of approx. 16 cm (*fig. 35: 1*). This piece, decorated around the periphery with a laurel wreath bordering what is unfortunately an illegible inscription in capital letters rendered in white enamel, offers an interesting comparison with the window disc from the Church of St. James the Great in Beroun, ordered by the Beroun potter Martin Kudrnáč and made in 1607 (*fig. 35: 2*). Although the motif of the laurel wreath applied to glass is not entirely unknown in the first half of the 17th century (cf., e. g., *Hejdová – Drahotová 1989*, 87; *Braunová, b. d.*, Fig. 14), the style of painting and the similarity of the type of letters elicits the hypothesis that the window disc in the church in Beroun was made at the glassworks in Broumy (located only 15 km away from Beroun).

The completed products and the amount of production refuse found indicate that window discs were made in Broumy using two different methods. In the first method, the disc was made by rotating a blown glass parison into a flat shape, which was finally set in shape with the help of a wooden plank; in this method a trace of the punty broken off would remain at the centre of the disc (*fig. 36: A*). In the second method the process also began with blowing a glass parison; its bottom was then flattened out by being pressed against a flat surface and cut away along the circumference (*fig. 36: B*). This method left no traces of punty on the window disc; however, it produced a great amount of waste, which was usually remelted, but there were still numerous examples among the finds (*fig. 35: 6*).

Other kinds of flat glass were not identified in the assemblage. However, written records mention, in addition to the glass "wheels", also "corner wheels", "mirror-plate glass" and "crude plates" (*Pelc 1951*, 30-31). Given that the glassworks supplied Křivoklát with one supply of "6000 plates" of mirror-plate glass, the price for 100 pieces of which was 54 kreutzers, it is impossible to imagine that this expression genuinely referred to mirrors, which is moreover rare among the finds and which was probably not being made in Bohemia at that time (*Drahotová et al. 2005*, 170). It was probably – as in the case of the "crude plates" – a kind of plate window glass with a rectangular shape, which was commonly produced at that time. As for the "corner wheels", one possible explanation that emerges is that it really was circular glass discs, perhaps even not entirely successful pieces, from which the desired shapes (most often

triangles) were cut out with pliers into the filling between the three circular window discs when windows were being glassed up by inserting the window discs into led frames on site.

b) Hollow glass

Identifying the variety of hollow glass produced at the glassworks in Broumy is difficult – as in the case of the ceramics – and is considerably limited by the fragmentary nature of the material, which essentially makes it impossible to reconstruct complete shapes, or usually even more significant parts of them. Another restriction in this regard is the limited scope of the excavation and the character of the layers, in which the fragments of completed glass, or unsuccessful products, were found only sporadically, as the majority of the refuse of this kind was remelted. Nevertheless, on the basis of an analysis of the glass artefacts, it is still possible to say that the majority of the standard shapes known from the 17th century were produced in Broumy glassworks.

Beakers

The collection of finds reveal the presence of beakers with a cylindrical (*fig. 37: 1*) and with a slightly funnel-shaped (*fig. 37: 2*) body, and there may even have been barrel-shaped (*fig. 37: 6, 11*) beakers, although the size of the fragments does not allow the shape to be determined clearly.

Differences also exist in the shape of the low part of the beakers – bodies of some pieces are set on a blown bell-shaped base (*fig. 37: 5*), but the majority have a simple, distinctively pricked bottom wound around with thick fibre (*fig. 37: 1, 4, 6, 7*) that sometimes is decorated with enamel (*fig. 37: 1*) or bears a wheel-pressed plastic decoration (*fig. 37: 6*); there are also fragments of what were probably cylindrical beakers with a "folded foot" (see *fig. 38*).

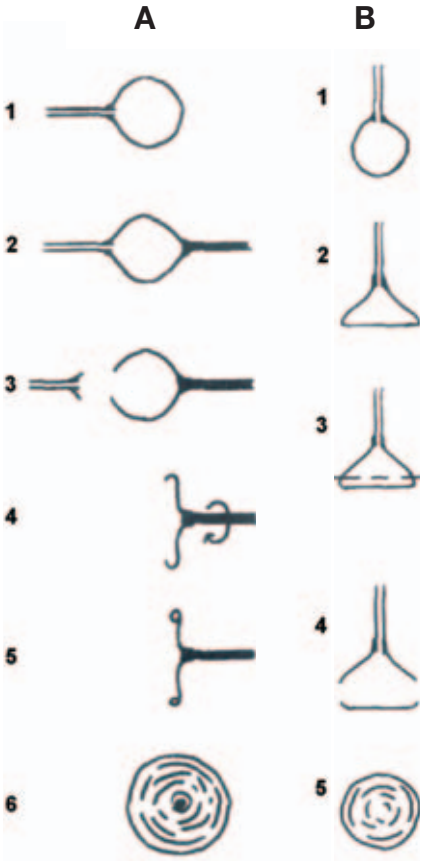

Fig. 36. Schema of two techniques used to make window discs that were evidently used in the glassworks in Broumy. Reproduced from a book by *P. Kurzmann* (*2004*, 260).
Obr. 36. Schéma dvou v Broumech doložených postupů při výrobě okenních terčíků. Reprodukováno z knihy *P. Kurzmanna* (*2004*, 260).

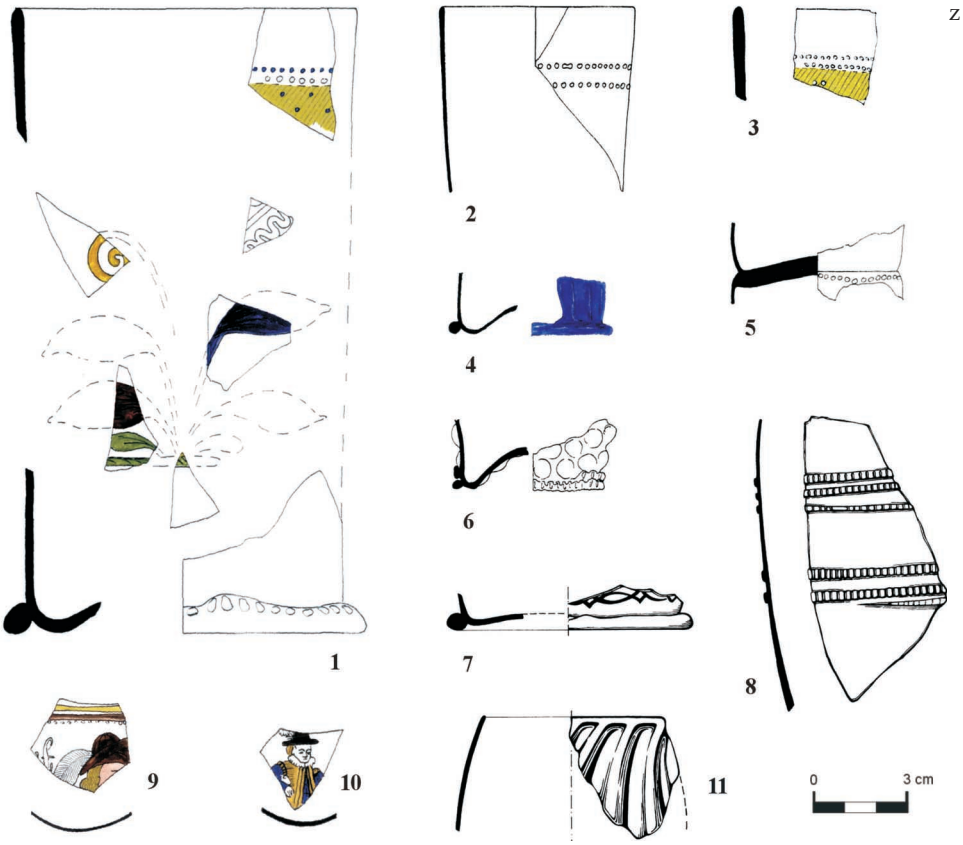

Fig. 37. Broumy, glass from the refuse layers from the 17th century. Beaker fragments (nos. B 105, B 101, B 123, B 150, B 163, B 98, B 105, B 54, B 51, B 182, B 54). *Drawing by V. Příhonská, I. Skokanová.*
Obr. 37. Broumy, sklo z odpadních vrstev 17. století. Zlomky číší (přír. č. B 105, B 101, B 123, B 150, B 163, B 98, B 105, B 54, B 51, B 182, B 54). *Kresba V. Příhonská, I. Skokanová.*

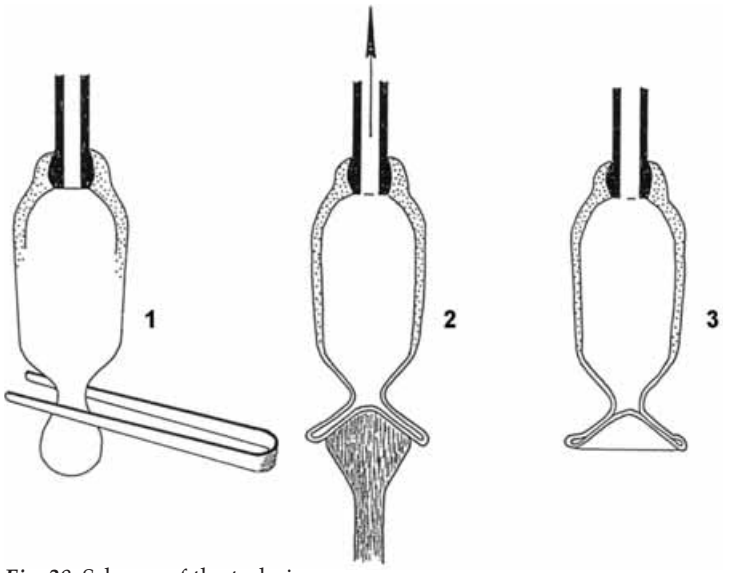

Fig. 38. Schema of the technique used to produce "folded foot". Reproduced from a book by *H. E. Henkes* (*1994*, 96).
Obr. 38. Schéma postupu výroby „složené" patky. Reprodukováno z knihy *H. E. Henkese* (*1994*, 96).

The bodies of the cylindrical beakers are often decorated with enamel paint, sometimes combined with gilding, based on figural, plant, and geometric motifs (*fig. 37: 1, 2, 3, 5, 7, 9, 10*), others using optical lentile-shaped decorations, or optical decoration of vertical or slanted stripes (*fig. 37: 4, 6, 11*). There are a number of fragments that can be considered to be fragments of tall cylindrical beakers, wound around with a spiralling glass fibre decorated with wheel-pressed decoration (*fig. 37: 8*).

The majority of the pieces are made of glass of various shades of green, and colourless glass is found mainly among the pieces painted with enamel. Occasionally a purplish tinged glass can be found.

Goblets

The goblets are also in a very fragmented condition. From what the fragments tell, the most common shapes are semi-egg-shaped goblets (*fig. 39: 1*) and goblets with a tall bell-shaped or funnel-shaped (*fig. 39: 2*) bowl. The bowl was set on a stem with a single or double ring, which terminate in a bell-shaped foot (*fig. 39: 1*).

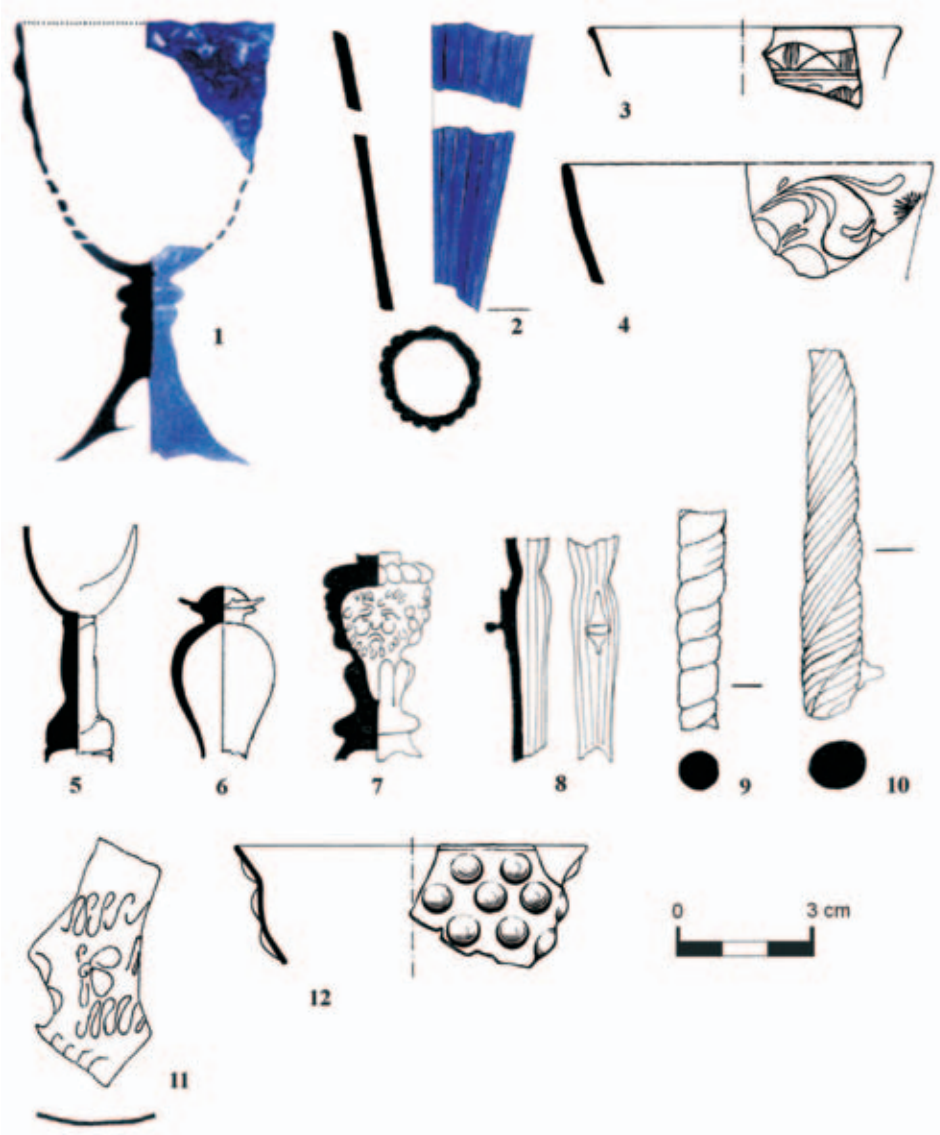

Fig. 39. Broumy, glass from the refuse layers from the 17th century. Goblet fragments (nos. B 19, 163, B 19, B 187, B 44, B 74, B 103, B 197, B 107, B 67, B 107, B 163, B 4). *Drawing by V. Příhonská, I. Skokanová.*
Obr. 39. Broumy, sklo z odpadních vrstev 17. století. Zlomky pohárů (přír. č. B 19, 163, B 19, B 187, B 44, B 74, B 103, B 197, B 107, B 67, B 107, B 163, B 4). *Kresba V. Příhonská, I. Skokanová.*

The foot was most often smooth, but also common was a kind of low, target-shaped foot made of a spirally-coiled fibre. Stems of more sophisticated pieces bear nodes in various shapes, including blown nodes decorated in relief with lionhead mascarons (*fig. 39: 7*); bowls of some goblets are set on baluster stems (*fig. 39: 6*), and there are also goblets on tall and thin and sometimes twisted (*fig. 39: 9, 10*) stems, in other cases on blown stems with vertical grooves (*fig. 39: 8*).

The bowls are usually smooth, and often also decorated with optical decoration using lentile-shapes (*fig. 39: 1, 12*), rhombuses, or vertical ribs. Unusual is a narrow, funnel-shaped mold-blown bowl from cobalt glass, decorated with strikingly moulded and thickset with vertical ribs (*fig. 39: 2*); this may have been an unfinished product, where the bowl was meant to be blown further. As in the case of the beakers, we find goblets with bowls decorated with enamel paint, sometimes in combination with gilding. There were only a few pieces of colourless glass decorated with an diamond engraving (*fig. 39: 3, 11*); however, it is difficult to identify whether these are goblet or beaker fragments. Also worth noting is a fragment of a rim (again, probably a goblet, although it could also be a beaker) of colourless glass with cut plant decorations (*fig. 39: 4*). This is the youngest piece in the entire collection, dating to the very end of the 17th century.

The goblet category also includes some finds of clear hollow glass, decorated with a spirally-twisted fibre. A purple fibre was found in the layers of production waste, but no completed products decorated with it were found in the collection.

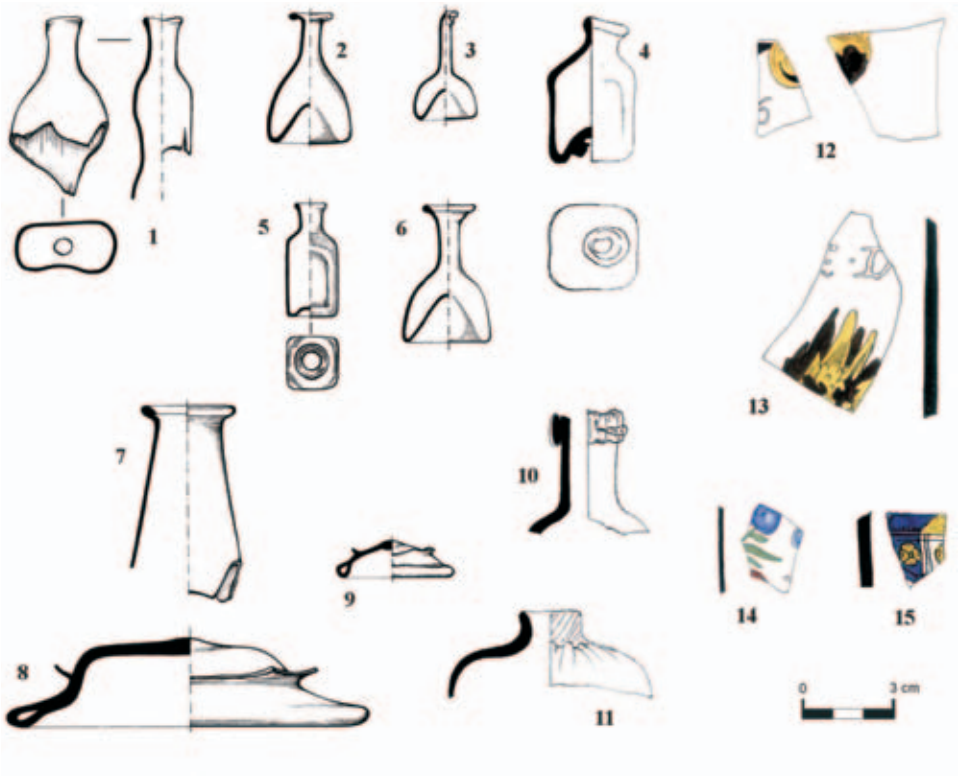

Fig. 40. Broumy, glass from the refuse layers from the 17th century. Bottle fragments. 1-6 – small bottles of various shapes (nos. B 103, B 117, B 54, B 7, B 103, B 117); 7, 8 – neck and foot of a large pear-shaped bottle (nos. B 83, B 144); 9 – foot of a small pear-shaped bottle (no. B 61); 10 – neck of a cylindrical bottle with the rim wrapped around with a fibre with wheel-pressed decoration (no. B 27); 11 – upper part of a tetrahedral bottle with optical decorations (no. B 107); 12-15 – fragments of a tetrahedral bottle painted with enamel (nos. B 4, B 74, B 4, B 107). *Drawing by I. Skokanová, V. Příhonská.*
Obr. 40. Broumy, sklo z odpadních vrstev 17. století. Zlomky lahví. 1-6 – malé lahvičky různých tvarů (přír. č. B 103, B 117, B 54, B 7, B 103, B 117); 7, 8 – hrdlo a patka velké lahve s hruškovitým tělem (přír. č. B 83, B 144); 9 – patka malé lahvičky s hruškovitým tělem (přír. č. B 61); 10 – hrdlo válcovité lahve s okrajem ovinutým vláknem zdobeným radélkem (přír. č. B 27); 11 – horní část čtyřboké lahve s optickým dekorem (přír. č. B 107); 12-15 – zlomky čtyřbokých lahví malovaných emailem (přír. č. B 4, B 74, B 4, B 107). *Kresba I. Skokanová, V. Příhonská.*

Bottles

Although it is difficult to identify the shapes of what are mostly tiny fragments, it can be said that bottles – along with window glass – constitute the majority of finds in the collection.

Small pharmaceutical bottles, produced during the first stage of the glassworks' existence, varied considerably in shape. The most common were small bottles with a cylindrical body and low, narrow neck, and bottles with a semi-spherical body and a tall, narrow neck, with glass fibre wrapped around the mouth (*fig. 40: 2, 3, 6*).

There were also bottles with tetrahedral (*fig. 40: 4, 5*), hexahedral and pear-shaped (*fig. 40: 9*) bodies and finally also a fragment of a small bottle with an oval flat body (*fig. 40: 1*).

The large and medium-sized bottles are, for the most part, typically tetrahedral in shape, some of them decorated with coloured enamel paint (*fig. 40: 12-15*) or with optical decoration (*fig. 40: 11*); in one case this shape of bottle is made of blue glass. The second common shape in the collection is pear-shaped bottles on a low bell-shaped ("folded") foot (*fig. 38*; *40: 7, 8*). Less common are bottles with a cylindrical body, sometimes with the rim wrapped around with a thick fibre bearing wheel-pressed decoration (*fig. 40: 10*).

Like the majority of other glass forms, the bottles are mostly made of a greenish glass.

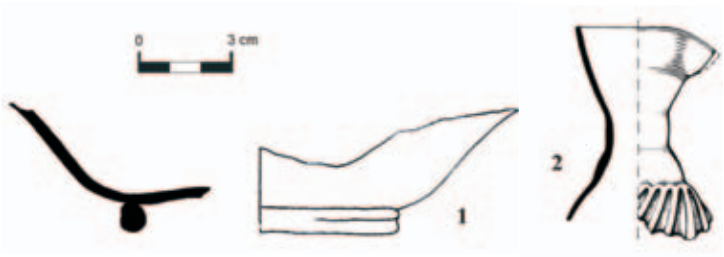

Fig. 41. Broumy, glass from the refuse layers from the 17th century. 1 – part of a bowl (no. B 98); 2 – neck of a tankard or jug (no. B 54). *Drawing V. Příhonská, I. Skokanová.*
Obr. 41. Broumy, sklo z odpadních vrstev 17. století. 1 – část misky (přír. č. B 98); 2 – hrdlo konvičky či džbánku (přír. č. B 54). *Kresba V. Příhonská, I. Skokanová.*

Other glass forms

Another fragment, categorised under tableware, is a part of a tankard or jug from greenish glass with a chalice-shaped rim with a marked spout and a body with an optical decoration in the form of slanted ribs (*fig. 41: 2*). There is also a bowl with widely outspread sides and with a foot formed from a thick fibre attached to the bottom (*fig. 41: 1*).

In the category of laboratory and technical glass (the production of which in Broumy is mentioned in written records) there are parts of glass pipes, sometimes in a cylindrical shape, others with a slightly widening shape, with diameters between 8 mm and 3 cm, made out of colourless glass; these may be parts of an alembics or funnels. At times, cylindrical vessels with a wide mouth and a collar-shaped rim, which are assumed to be vessels used to hold medicinal substances and ointments and which were found in Broumy, are also included into this category (*Drahotová et al. 2005*, 169; *Podliska 2003*, 29; *Kaván 1982*, fig. 25: 5, 6).

c) Other finds

Alongside the above -mentioned hand-made fragments from the fire horizon from 1600, whorls and whorl fragments, made of greenish glass, were identified in the collection.

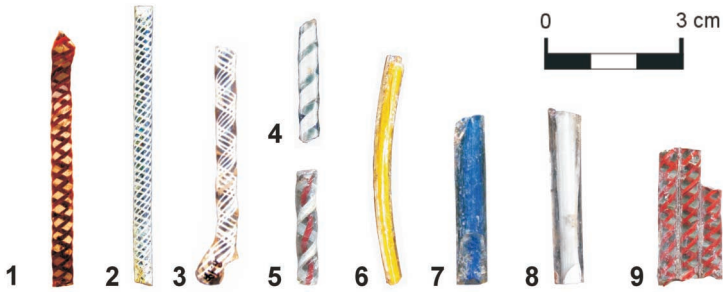

Fig. 42. Broumy, glass from the refuse layers from the 17th century. Various types of rods with a flat or spiral coloured fibre for the production of filigree glass (no. B 198, B 111, B 197, B 150, B 150, B 137, B 150, B 150, B 150). *Photo by J. Žegklitz.*
Obr. 42. Broumy, sklo z odpadních vrstev 17. století. Různé typy tyčinek se zataveným rovným či ovinutým barevným vláknem k výrobě nitkovaného skla (přír. č. B 198, B 111, B 197, B 150, B 150, B 137, B 150, B 150, B 150). *Foto J. Žegklitz.*

d) Semi-finished products – filigree glass, turquoise glass

Some of the most interesting finds, present even in the oldest horizon, are some semi-finished products for the production of filigree glass. These represent a numerous group of fragments of straight rods with diameters between 4 and 9 millimetres, the majority of which were made of colourless glass in the core and were wrapped with a thin layer of coloured glass (white, red, yellow, blue), overlaid again by colourless glass (*fig. 42: 6-8*). In some cases, the core is formed by a thread of coloured glass, often it is a colourless core wrapped around with 1-5 spiralling threads of coloured – white or red – glass and again overlaid with coloured glass (*fig. 42: 1-3*). Exceptionally we can find combinations, in which

the core is made of a straight or a slightly wavy red thread, wrapped with colourless glass, wrapped around with a spiralling fibre of white glass on the surface (*fig. 42: 5*). In some cases the colourless core is probably not wrapped with a coloured glass (or wrapped around with a thread of coloured glass), but is instead coloured with enamel – either completely (a fili – *fig. 42: 4*) or in a spiralling manner (a retorti).

Glass rods prepared in this way were then placed along the circumference of a mould adapted to this purpose, into which a parison of colourless glass was blown and the rods would stick to its walls; another procedure was the same as that used in other similar shapes (*fig. 43: A*). The second option was to join the rods placed close side by side in a plate, out of which then a cylinder was made that was further formed into the desired shape (*fig. 43: B*); evidence of this procedure is also found in Broumy, with the find of three connected rods wrapped around with a red fibre (*fig. 42: 9*).

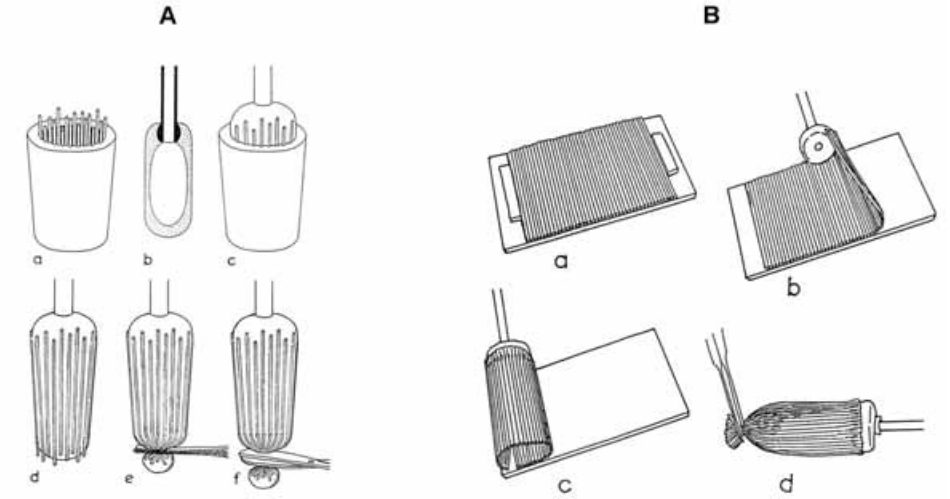

Fig. 43. Two possible techniques for producing filigree glass. Reproduced from a book by *H. E. Henkes* (*1994*, 170-171).
Obr. 43. Dva možné postupy při výrobě nitkovaného skla. Reprodukováno z knihy *H. E. Henkese* (*1994*, 170-171).

The procedure in which the rods with a straight coloured thread are placed parallely in a mould produced a glass where the colour threads do not cross one another (so-called *vetro a fili*, a fragment of which was found in the layers of production waste); when using rods wrapped around with a spiralling colourful fibre, then the coloured fibres crossed in the wall of the finished product (so-called *vetro a retorti*); very often both techniques were combined in a single product.

Particularly noteworthy is a small fragment of blown "filigree" glass with a dual-coloured "fibre", made of a 5 mm-wide belt of overlapping red and white enamel (*fig. 44: 1*). The only known domestic analogy to this type of glass is a bowl that dates from one of the Early Modern period cesspits on the grounds of Prague Castle excavated in 1932 (*fig. 44: 2*). Although in literature this piece is dated as coming from the 16th century (*Drahotová 2005*, fig. 34 in the colour appendix to Chapter 3), that is, to a time before the glassworks was founded in Broumy, an as yet unpublished collection of ceramics from this cesspit indicates that it was still being filled during the first decades of the following century. Given the known historical relations between the glassworks in Broumy and Prague Castle and given the unique character of this type of glass (and also considering the relatively poor quality of glass and the imperfect shaping of the artefact from Prague Castle, which would rule out anything but domestic origin), it is very likely that the bowl found at Prague Castle was made at the glassworks in Broumy. (Another possible piece of evidence of the contacts

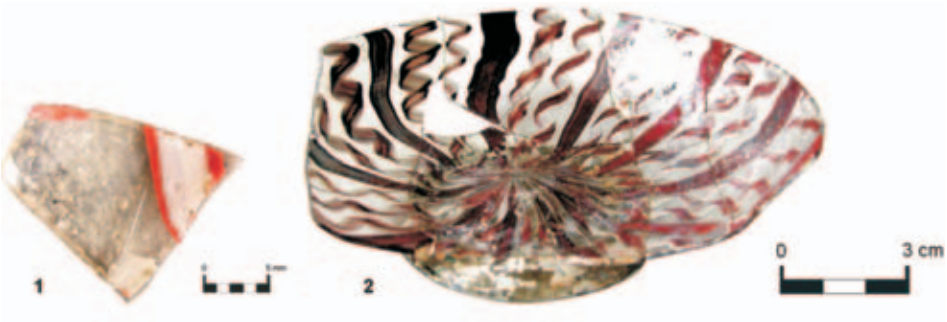

Fig. 44. 1 – Broumy, a fragment of blown "filigree" glass (red and white enamel paint between two layers of colourless glass, no. B 4); 2 – Prague Castle, dump beneath the eastern stairs to the Spanish Hall (no. 2328). Bowl decorated using the same technique. *Photo by J. Žegklitz and the archives of the department for research on Prague Castle, Institute of Archaeology, Czech Academy of Sciences.*
Obr. 44. 1 – Broumy, zlomek dutého skla zdobeného „nitkováním" (červeno-bílá malba emailem mezi dvěma vrstvami bezbarvého skla, přír. č. B 4); 2 – Pražský hrad, smetiště pod dnešním východním schodištěm do Španělského sálu (přír. č. 2328). Miska zdobená stejnou technikou. *Foto J. Žegklitz a archiv pracoviště pro výzkum Pražského hradu Archeologického ústavu AV ČR.*

between the Broumy glassworks and Prague Castle is the find of a cold-work painted plate of an milk-coloured glass with a slightly blue tinge, found in the cesspit in the courtyard of the hospital of St. Antonín, refounded by Ferdinand I in 1547 nearby Prague Castle (*Veselá 2003*, 13); the cesspit was filled during the second quarter of the 17th century (*Frolík – Smetánka 1997*, 224). Milk-coloured glass from this period is an exceptional find, but there is evidence that it was in Broumy that this type of glass was made sometimes during the 17th century, so the connection between the Broumy glassworks and this find is very likely.)

The last artefact of a semi-finished product intended for further work is the find of two tiny (diameter 4.5 mm) spherical beads or bead halves, made from a slightly opaque turquoise glass; similar beads, usually set into a raspberry-like prunts of colourless glass, were a typical decorative feature on glass made in the Netherlands in the second half of the 16th century (cf. *Henkes 1994*, 172, 176). The find of berkemeier with this type of decoration on the grounds of St. Antonín hospital in Hradčany is regarded to be an import (*Veselá 2003*, 12) and it is not a common find in the Czech lands; this again leads to thoughts about a connection with the glassworks in Broumy, but in this case greater caution is required, as the production of this kind of decorated glass in Broumy has never been documented and the turquoise beads need not have been produced at this site or even have been intended for further use to decorate glass produced here.

3. Conclusion

Leaving aside the debatable interpretation relating to the furnace from the excavation on the grounds of St. Agnes Monastery in Prague, which is described in literature as a glass furnace, but without substantial enough evidence for this (*Hejdová – Reichertová 1982*), the glassworks in Broumy – alongside the glassworks in Rejdice (*Hejdová 1981*) – is the only Renaissance site of this type in the Czech lands that has been the subject of archaeological excavation.

Although the excavation was limited in scope – only on an area that had been affected by building works –, it was possible to verify the two phases of existence of the glassworks mentioned in written sources: the first phase between 1596 (?) and 1600, when the glassworks burned down, the second phase after this date or after 1603, when it began operating again. The fire horizon dating from the year 1600 is an exceptionally valuable marking point for dating the contexts unearthed in the excavation and for dating the unearthed artefacts.

A unique find is the body of the tile stove, destroyed by the fire in 1600, which was found in the corner of one room in the excavated building. The tiles and other ceramic parts of the stove found, including the stone base on which the structure stood, made it possible to create a relatively plausible drawn reconstruction.

In certain regards, another unique fragment is the find of the filigree glass together with the semi-finished products for making it, which also came from the older horizon. Although the production of filigree glass in the Czech lands in the decades around the turn of the 17th century is known from written records and material sources, the find in Broumy is unique due to the joint presence of both finished and semi-finished products, and because it is possible to date it with an accuracy of within one year.

The numerous semi-finished products found – rods of colourless glass with coloured glass fibres – indicate that the filigree glass produced, copying a technique applied in Venice from the start of the 16th century, continued in Broumy over the course of the 17th century. The very few finds of tiny fragments of products made using this technique suggests that they were pieces that were difficult to make and were produced and preserved with the greatest care. The strong similarity between the filigree glass made at the glassworks in Broumy and pieces found at Prague Castle indicates that the origin of the latter should be sought in Broumy. Information from written sources that the Broumy glassworks supplied the Prague court of Rudolph II and the towns of Prague with glass makes this a very likely possibility.

Other products made in Broumy do not diverge from what we know about the type of glass produced in the Czech lands in the 17th century. The basic variety of the types and shapes of Broumy glassworks products corresponds to archaeological finds of Renaissance glass, particularly from urban sites, including production imitating older Venetian models. The exceptional standing of the Broumy glassworks which, according to written records, produced tableware and special (technical and laboratory) glass for the Imperial Court, was not especially reflected in the collection of finds. Luxury and otherwise exceptional products are not, however, by their very essence, among the types of goods that we expect to find in large numbers in refuse layers. The quality of the collection of finds was also certainly affected by the location and the scope of the archaeological excavation, and it is therefore possible that continued archaeological excavations sometime in the future could help provide a fuller picture of local glassmaking production.

Resumé:

Po přechodném útlumu na konci 15. a v prvních desetiletích 16. století dochází kolem poloviny 16. století v českých zemích k opětovnému rozkvětu sklářské výroby. Významnou roli v tomto procesu sehráli příslušníci německých sklářských rodin (Schürerové, Preusslerové, Friedrichové, Wanderové a další), kteří byli kvůli rostoucím cenám dřeva na saské straně Krušných hor nuceni hledat možnosti svého uplatnění jinde. První známou a zároveň nejvýznamnější hutí, která díky této migraci na českém území vznikla, byla v roce 1530 Pavlem Schürerem založená sklárna ve Falknově. Další hutě pak vznikají v průběhu následujících desetiletí až do počátku 17. století, a to nejprve v pohraničních oblastech, později i v příhodných místech ve vnitrozemí.

Snahy o založení sklářské huti v Broumech mají svůj počátek již na konci třetí čtvrtiny 16. století, kdy se o takový krok neúspěšně pokoušel v Praze žijící italský sklenář Mikuláš Perlo. Pozitivním výsledkem neskončil ani pokus neznámého hutníka z Blatné u Jáchymova na konci 80. let 16. století, a tak svého naplnění dosáhly tyto snahy až roku 1599, kdy Kryštofu Schürerovi na základě jeho žádosti z roku 1596 povoluje zřídit na křivoklátském panství u vsi Broum sklárnu

svým majestátem sám císař Rudolf II. Nezanedbatelnou roli při tom nepochybně sehrála skutečnost, že Kryštof, od roku 1570 glosmistr sklářské huti ve Falknově, již nějaký čas přímo pro Rudolfa II. pracoval.

Kryštof obdržel dědičně 6 lánů půdy k vybudování domu, dvora a hutě a zřízení polí, luk a rybníka. Získal právo postavit mlýn o jednom kole, pilu a domky pro své dělníky, dále právo porážet dobytek a provozovat masný krám, péci chléb na prodej a točit pivo. Z ležícího dřeva směl na podzim a v zimě s povolením hajného pálit popel, přidávaný do sklářského kmene jako tavidlo. Písek pro potřebu hutě se těžil na svahu na protější straně Úpořského potoka, ložiska křemence, který byl podle nálezů rovněž využíván, se nachází jižně a jihovýchodně od Broum v okolí nedalekého Kublova. Jako protihodnotu za přiznané výsady musel majitel hutě odvádět ročně 40 kop grošů míšeňských a na Křivoklát dodat truhlu okenních skel, případně náhradou za ně další 4 kopy grošů.

Stavba huti byla zahájena pravděpodobně bezprostředně po uzavření smlouvy v roce 1596, tedy před vydáním majestátu, neboť v roce 1600 byla již dokončena. Po velmi krátkém fungování však huť ještě v tom samém roce vyhořela. Její provoz byl obnoven v roce 1603, kdy již byla v rukou Kryštofova syna Pavla.

Ze zpráv křivoklátského hejtmana víme, že stejně jako jeho otec Kryštof, i Pavel pracoval pro císařský dvůr. O tom, jak byly jeho služby ceněny, svědčí i fakt, že když byl Pavel vyzván majitelem sloupského panství Adamem Berkou z Dubé, aby se vrátil do Falknova, obrátil se dopisem na císaře, aby směl v Broumech zůstat (s odkazem na to, že právě pracuje na další dvorní zakázce včetně „etliche Sachen und Feuerarbeiten“), a jeho žádost byla kladně vyřízena hned druhého dne.

Huť pod Pavlovým vedením prosperovala až do třicetileté války. Válečné konflikty se Broum dotkly hned dvakrát: poprvé v roce 1634, kdy byly Broumy vydrancovány a vypáleny z Chebu se vracejícím císařským vojskem, podruhé se museli broumští obyvatelé skrývat před vojáky o osm let později. Ušetřena nebyla ani samotná huť – na počátku padesátých let křivoklátský hejtman uvádí, že „na huti je mnoho dluhů a od vojáků zkázu vzala“.

Za této situace Pavel Schürer v roce 1647 umírá. Majetek je rozdělen mezi vdovu a devět dětí, přičemž huť se dostává do rukou Pavlova syna Kašpara. Tomu se sice podařilo vyrovnat staré závazky, nebylo však v jeho silách udržet huť dále v provozu bez nových dluhů, a proto ji roku 1671 prodává. Novým majitelem se stal Jan Rieger, který v Broumech začal pracovat jako sklářský tovaryš někdy kolem roku 1650. Léta Riegerova vedení znamenala pro sklárnu období nové prosperity. Situace se ovšem znovu změnila po jeho smrti v roce 1690, kdy huť přebírá jeho syn Jan. K problémům výrazně přispěla změna majitele křivoklátského panství, jímž se v roce 1685 stal Arnošt Josef z Valdštejna. Ten sklárně zakázal prodávat dřevo, popel musel být proto dovážen zdaleka a výroba se tím neúměrně prodražovala. Z této situace se huť již nikdy nevzpamatovala. V dalších desetiletích se ve vedení sklárny vystřídali další členové rodiny Riegerů, z nichž Jan Kryštof, který zemřel v roce 1743, byl posledním činným sklářem v Broumech. Po jeho smrti zůstává již nevyrábějící huť v rukou Riegerů ještě dalších 8 let. V roce 1751 ji vdova po Janu Kryštofovi Kateřina definitivně prodává Marii Anně z Fürstenberka a areál sklárny je upraven pro potřeby hospodářského dvora. Při této příležitosti dala nová majitelka úředně přeměřit a zakreslit všechny k huti patřící pozemky; dodnes dochovaná mapa (*obr. 1*) je cenným svědectvím o podobě celého areálu sklárny i samotné huti nejen v polovině 18. století, ale nepochybně i v dobách starších.

Záchranný archeologický výzkum lokality byl vyvolán neohlášenými zemními pracemi ve středu výrobního areálu zaniklé sklárny, při kterých bylo zničeno téměř 150 m2 plochy se všemi archeologickými situacemi. V jihozápadní stěně stavební jámy byly patrné zděné objekty nejasné funkce a mocná kulturní vrstva, obsahující velké množství odpadu z provozu sklářské huti. Záchranný výzkum o rozsahu asi 55m2 proběhl v letech 1988-89 na ploše bezprostředně navazující na stavební jámu s cílem prozkoumat narušené objekty a navazující plochu interiéru bývalé stodoly, kde byly v souvislosti se zamýšlenou stavbou rovněž plánovány zásahy do terénu.

V jihovýchodní části zkoumané plochy byly odkryty základové partie stavby, sestávající nejméně ze dvou místností (*obr. 4, obj. 9/1, 3*). Jihozápadní o rozměrech 360 x 340/360 cm sloužila k pravidelnému lidskému provozu, o čemž svědčí situování kachlových kamen v jejím severním rohu. Výjimečným nálezem byl především na původním místě odkrytý kamenný podstavec (*obr. 4, obj. 5*), díky kterému bylo po laboratorním zpracování získaného kachlového materiálu možné pokusit se o kresebnou rekonstrukci původního vzhledu kamnového tělesa (*obr. 6*). V bezprostředním sousedství kamnového tělesa v severozápadní obvodové zdi byl umístěn vchod, z něhož se zachovala část zříceného kamenného ostění (*obr. 8*), zbytky kamenného prahu či schodového stupně a patří k němu snad i některé z kůlových či sloupových jam, interpretované jako pozůstatek zastřešující konstrukce.

Převážná část sousední místnosti byla zničena bagrováním. Přesto se v jejím jihozápadním rohu podařilo odkrýt zuhelnatělé zbytky dřevěného regálu či truhly, kde byly uskladněny hotové skleněné výrobky (kruhové okenní terčíky a malé lékárenské lahvičky – *obr. 9*). V těsné blízkosti ležel na podlaze místnosti kruhový plát jílu s černě probarveným středem (*obr. 4, obj. 6*; *obr. 10*), interpretovaný jako podložka pro drátěný koš se žhavými uhlíky k vytápění; to svědčí o tom, že i tato místnost byla přinejmenším zčásti obývána.

Zbytek poměrně masivního kamenného ostění vchodu i přítomnost kachlových kamen napovídají, že objekt byl původně zděný. Úzká základová zeď a ostrá hrana udusané jílové podlahy podél řady základových kamenů pak naznačují, že zdi byly vybudovány z cihel, i když jasné pozůstatky nadzemních konstrukcí nebyly výzkumem zaznamenány. Subtilní základové partie stavby pak dovolují předpokládat, že se jednalo o stavbu jednopodlažní.

Žárem propálená jílová podlaha interiéru i na ní spočívající vrstva tvořená hroudami propáleného jílu se zlomky cihel a množstvím uhlíků svědčí o tom, že dům padl za oběť požáru. Některé nepřímé indicie (absence našlapané vrstvy na podlaze interiéru i vrstev pod požárovým horizontem vně stavby, pouze nepatrné očazení jen některých kachlů) vedou k závěru, že se nejednalo o požár související s vojenským drancováním za třicetileté války, ale o požár z roku 1600, který zničil huť jen pár týdnů po jejím dokončení.

Po tomto požáru dům již nebyl obnoven. Použitelný stavební materiál byl ze spáleniště vybrán a znovu využit na jiném místě a plocha původního domu byla postupně zavážena huťským výrobním odpadem. Někdy v průběhu 17. století byla do již částečně uložených odpadních vrstev vyhloubena rýha a do ní položen dřevěný vodovod (*obr. 4, obj. 4*), sloužící snad k odvodu vody z nádrže, kterou do těchto míst situuje plán z roku 1751 (*obr. 18*).

V těsném severním sousedství domu byl výzkumem odkryt výrobní objekt zhruba čtvercového půdorysu (295 x 270 cm), zbudovaný z kamenů spojovaných žlutým jílem a stavěný současně s domem (*obr. 4, obj. 8/1*; *obr. 19*). Mělká jáma vyhloubená před jeho jihozápadní stěnou a vyplněná vrstvami uhlíků a popela svědčí o tom, že se jednalo o pec; její narušení mladšími zásahy však neumožňuje říci o její podobě nic bližšího.

I tento objekt byl narušen zmiňovaným požárem. Na rozdíl od obytné stavby byl ovšem obnoven – k jeho severozápadní a jihozápadní (a pravděpodobně i severovýchodní) stěně byla přizděna kamenná, na světle hnědou hlínu kladená plenta o síle 50-90 cm s mohutnými balvany v čelních nárožích (*obr. 19, obj. 8/2*) a dno středu pece (přinejmenším při její jihozápadní, čelní straně) bylo vyzděno cihlami. K západnímu nároží přiléhala plocha rovněž vydlážděná cihlami a lemovaná velkými plochými, na hranu stavěnými kameny – patrně plocha komunikační, sloužící k pohybu u pece, případně mezi ní a sousedními objekty (*obr. 23*). Velké sloupové jámy u severozápadní stěny pece patřící již ke starší fázi pece (*obr. 19, kj. 34, 35*) naznačují, že celý objekt byl kryt dřevěnou střechou.

Vzhledem ke značnému narušení objektu jak stavební jámou, tak zejména již dříve základovými partiemi obvodové zdi stodoly, je obtížné stanovit, jakému účelu sloužil. Výrazné propálení kamenů lemujících vnitřní prostor objektu i vrstvy popela a uhlíků v předpecní jámě zřetelně dokládají práci s ohněm, naprostá absence zbytků skloviny, velikost objektu i jeho situování v bezprostřední blízkosti domu zároveň vylučují možnost, že by šlo o tavicí pec. Jako nejpravděpodobnější se jeví hypotéza, že se jednalo o některou z pomocných pecí, jejich přítomnost ve sklářských hutích je doložena již pro období vrcholného středověku. Jako méně pravděpodobné se jeví možnosti, že by šlo o pec fritovací (v níž byla připravována tzv. frita – jen částečně protavená směs písku a alkalických přísad, která se po vychladnutí drtila a znovu tavila), případně pec chladicí; spíše lze uvažovat o peci pražicí (sloužící k zahřívání velkých kusů křemene, jež se poté rychle zchladily a popraskané se dále drtily), muflové (k vypalování emailů) či temperovací (k předehřívání pánví před jejich vsazením do tavicí pece).

Podle stratigrafické situace pec fungovala poměrně dlouhou dobu, zcela jistě ještě v průběhu druhé poloviny 17. století. Stavební vývoj ve zkoumané části areálu byl poté uzavřen výstavbou objektu stodoly, nejspíše v souvislosti s přeměnou již nefungující hutě na hospodářský dvůr v polovině 18. století.

Výzkumem získané movité artefakty lze rozdělit do tří základních skupin: a) běžná užitková keramika sloužící v domácnostech zaměstnanců hutě, b) výrobní nástroje, c) sklo a skleněné výrobky.

Stolní a kuchyňská keramika (*obr. 14, 28, 29*) zahrnuje v zásadě celý v té době běžný sortiment: hrnky a hrnce, hluboké mísy (včetně zlomku mísy na zvonovité nožce), mělké mísy, talíře, džbány a pánve. Odhadem zhruba polovina hrnců je opatřena vnitřní glazurou, vnější výzdoba se omezuje na převažující vodorovné rýhování na podhrdlí, případně červené malování či vzory tvořené radélkem. Značné procento představují kusy režné, nejméně je zastoupeno redukční pálení spojené se zakuřováním a leštěním. Mezi džbány a mělkými mísami nalézáme malované výrobky patřící do skupin

berounského červeného i bílého zboží, přítomen je zlomek talíře s modrou malbou na bílém podkladu (Koulova tzv. pražská skupina z poslední třetiny 17. století). Vedle hrnčiny je v nálezovém souboru zastoupena i kamenina – torza radélkem, případně i v kombinaci s nalepovanou výzdobou zdobených džbánů a malých dóziček, dovážených ze saského Waldenburgu, i zlomek modře glazovaného džbánu s rostlinnou výzdobou z porýnské oblasti Westerwaldu. Výjimečný je nález torza oboustranně bíle glazovaného fajánsového džbánku z produkce moravských novokřtěnců.

Kategorie výrobních nástrojů a nářadí (*obr. 30-32, 34*) je reprezentována především zlomky tavicích pánví všech velikostí – od velkých kusů o průměru téměř 50 cm přes pánvičky či tyglíky středních velikostí, určené často k tavení barevných skel, až po patrně testovací kelímek s výškou 34 mm a průměrem 44 mm. Přítomny jsou i zbytky píšťal, a to jak části železných trubic, tak i unikátní bronzový náústek ve tvaru protáhlého zvonku. Technická keramika je zastoupena nálezy zlomků chladicích hrnců, sloužících k pomalému chlazení hotových skleněných výrobků, i zlomky krytů pracovních otvorů pece.

Nálezy zlomků hotových výrobků, surového skla i pánví se zbytky skloviny vypovídají o tom, že v broumské huti byly vyráběny prakticky všechny v té době známé druhy skloviny: základní bezbarvá (případně našedlá či s různými odstíny zelené), modrá (kobaltová), modrozelená, fialová a hnědá; z opakních skel se vyrábělo sklo červené (sklo barvy pečetního vosku, tzv. Welschrot) a bílé (cíničitý opál i sklo mléčné, kalené kostním popelem).

Typově je v nálezech zastoupeno jak sklo ploché, tak samozřejmě duté. Ploché sklo (*obr. 35*) reprezentují výhradně kruhové okenní terčíky, v jednom případě i s emailovou malbou; písemné prameny zmiňují i výrobu skla tabulového, jež však není v nálezovém souboru zastoupeno.

Identifikace sortimentu v Broumech vyráběných dutých skel je výrazně omezena jejich značnou fragmentárností. I přesto lze konstatovat, že přítomna je většina v dané době běžně vyráběných tvarů.

Číše (*obr. 37*) jsou zastoupeny tvary s válcovitým, kónickým a snad i soudkovitým tělem. Dna bývají buď jednoduchá, více či méně výrazně vpíchnutá a po obvodu ovinutá silným vláknem, zdobeným někdy radélkem či malbou emailem, případně posazená na duté zvonovité patce. Těla jsou často zdobena malbou barevnými emaily, případně i v kombinaci se zlacením. Hojné jsou i různé varianty optického dekoru, v menší míře pak zdobení spirálovitě ovinutým vláknem s radélkem.

Mezi poháry (*obr. 39*) převažují tvary s polovejčitou či vysokou trychtýřovitou kupou, posazenou na zvonovité patce s dříkem opatřeným jednoduchým nebo dvojitým prstencem. Dalšími variantami jsou dříky balustrové, do forem foukané nody zdobené lvími maskarony či úzké, vysoké válcovité dříky tordované, případně podélně rýhované. Kupy bývají stejně jako v případě číší zdobeny optickým dekorem, malbou emaily či ovíjením tenkým barevným (modrým) vláknem; optický dekor někdy doprovází kusy vyrobené celé z modrého skla. Patrně do skupiny pohárů patří zlomky těl zdobené rytím diamantem. Jediný zlomek okraje (snad poháru, vyloučena není ani číše) nese rostlinnou výzdobu řezanou kolečkem; jde patrně o nejmladší kus z celého nálezového souboru, zařaditelný na samotný konec 17. století.

Zdaleka největší část souboru představují lahve (*obr. 40*). Mezi velkými a středními tvary převažují lahve čtyřboké, zdobené často malbou emaily, případně optickým dekorem; dalším typem jsou lahve s hruškovitým tělem na nízké zvonovité patce. Hojně jsou zastoupeny i malé lékárenské lahvičky, jejichž výroba je rovněž doložena písemnými prameny; mezi nimi nalézáme tvary s válcovým tělem, s polokulovitým tělem a vysokým úzkým hrdlem, dále lahvičky čtyřboké, šestiboké i s oválným zploštělým tělem.

Vedle těchto základních typů jsou v nálezovém souboru přítomna i torza konvičky či džbánku a misky (*obr. 41*). Poměrně časté jsou i části úzkých trubic, snad z alembiků, případně trychtýřů.

K nejzajímavějším kusům patří nepochybně zlomky dutých skel z neidentifikovatelných tvarů, zdobené technikou nitkování, importovanou do středoevropského prostředí z Benátek (*obr. 17, 44*). Vzhledem k tomu, že byly v Broumech nalezeny i polotovary k výrobě tohoto typu skla (skleněné tyčinky z bezbarvého skla ovinuté bílým či červeným skleněným vláknem, případně se zataveným vláknem rovným – *obr. 42*), je nepochybné, že se tento typ skla v broumské sklárně vyráběl. Přítomnost zlomků hotových výrobků i polotovarů v nejstarším horizontu z doby fungování sklárny před požárem roku 1600 je tak jedním z nejstarších dokladů výroby nitkovaného skla na našem území.

Ve svém celku nevybočují nálezy skel broumské produkce z existujících představ o typech a tvarech skla daného období. Výjimečné postavení broumské huti vyrábějící dlouhodobě pro císařský dvůr se tedy v nálezovém souboru nijak výrazně neodrazilo. V potaz je ovšem třeba brát fakt, že přítomnost luxusních výrobků, které se zde nepochybně vyráběly, nelze v odpadních vrstvách ze samotné jejich podstaty očekávat, a především polohu a rozsah terénního výzkumu; je tak dosti pravděpodobné, že jeho případné pokračování by obraz o zdejší produkci výrazně doplnilo.

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From the Gothic period to the Renaissance. Glass in Moravia 1450 – circa 1560[1)]

Od gotiky k renesanci. Sklo na Moravě 1450 – ca 1560

Von der Gotik zur Renaissance. Glas aus Mähren 1450 – ca. 1560

Hedvika Sedláčková

Dieser Beitrag ist der Analyse von Glasprodukten aus der Zeitspanne von Spätgotik bis Frührenaissance gewidmet. Die Datierung einzelner Objekte konnte aufgrund von Münzfunden, dendrochronologischen Daten bzw. Schriftquellen präzisiert werden. Aufgrund einer ausführlichen Verarbeitung der Funde von 50 Befunden in Mähren konnte der allmähliche Übergang von den gotischen zu den Renaissance-Formen spezifiziert werden. Die Prosperität der mährischen Glasindustrie kommt etwa seit der Mitte des 15. Jahrhunderts durch die zunehmende Glasmenge und Variabilität der Formen zum Ausdruck, in der Fähigkeit Einflüsse aus Deutschland und Italien aufzunehmen und dem einheimischen Geschmack anzupassen.

I. Introduction

The material culture of the late Gothic and early Renaissance is among the least researched topics in the history of archaeology in the Czech lands. This is despite the fact that in excavations in historical town centres, this is a period that is very well represented in the evidence provided by building documentation as well as in the finds in cesspits that were deserted during the building boom taking place with the onset of the Renaissance and that form a primary source of finds, including glass.

Considerable attention is devoted, in most European countries, to glass production in this period. It was at that time that the process of glassmaking was "industrialized", which converted glass from the category of a luxury good into an item of everyday consumption used among the wider strata of the urban population. A broader awareness of mediaeval glass, encompassing a considerable amount of late Gothic products, was initiated in the 1930s by Franz Rademacher with the publication "Die deutschen Gläser im Mittelalter" (Berlin 1933). He drew on archaeological materials, museum and church collections, period artwork, and written sources. He categorised and defined the essential types and shapes of German glass and thus laid the foundations for further work not just in Germany, but also in countries whose mediaeval history, and consequently also cultural and trade influences, was connected with Germany. In later periods, primarily large assemblages of glass from museum collections (*Saldern 1965*; *Mosel 1979*; *Rückert 1982*; *Dexel 1983*; *Haase 1988*), or from the collections of major collectors (*Baumgartner 1987*; *Henkes 1994*) were published. A significant proportion of these collections involved glass from the period between circa 1450 and 1550 and provides a good foundation for further evaluation. A new look at the spread of glasswork in urban households was put forth in the monographs on archaeological finds from entire towns, such as Lübeck (*Dumitrache 1990*), Schleswig (*Steppuhn 2002*) or Braunschweig (*Bruckschen 2004*).

Note 1:
This text was prepared with a strong support from colleagues of Archaia Brno corporation, namely Petr Holub, David Merta, Marek Peška, Rudolf Procházka, and Antonín Zůbek. The same support I received from colleagues from Brno City Museum - Dana Cejnková, Lea Charvátová, Irena Loskotová, and Anna Žáková. Photodocumentation of Brno finds (with the exception of pictures 9 c, 19 c, 30, which are my own ones) was made out by Karel Šabata and Miloš Strnad from Brno City Museum.
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At the end of the 1980s, mediaeval glass from a large part of Europe was shown at two large exhibitions. The exhibitions included catalogues summarising the knowledge on the work to date. The exhibition "Phoenix aus Sand und Asche", installed in 1988 in Bonn and Basel, focused on glass from the German cultural sphere. Several examples from the Czech lands illustrate the contemporary state of knowledge in the Czech lands (*Baumgartner – Krueger 1988*). The exhibition, which took place the next year in Rouen, showcased the development of glassmaking in France (*Foy – Sennequier 1989*). Both these works contain material in evolutionary succession up to the middle of the 16thcentury and thus offer the possibility of comparison. French glassmaking, drawing on a classical tradition of lime glass and based on the natural cultural needs and customs of the population, took the path of small shapes, intended for the consumption of wine, up to the start of the Early Modern period. In German glassmaking, tall, beer-related shapes prevailed, working with a potash-lime glass.

Finds from countries closer to Moravia have been published on in detail in Hungary, but usually in a language not understandable for many. However, the large number of illustrations can be used (*Gyürky 1986*; *1991*; *2003*; *Mester 1997*; *2003*). We can learn about material from Vienna and Lower Austria in the publications by *K. Tarcsay* (*1999*; *2002*; *2003*), and about glassworks in Hall by *E. Egg* (*1962*). Finds from Slovakia are recorded in a number of articles, which are cited throughout this text.

Archaeological finds of mediaeval glass in the Czech lands have been the subject of attention since the 1960s. After a thorough analysis of the large collections of glass from Pilsen (*Hejdová – Nechvátal 1967*; *Frýda 1979*), Kutná Hora (*Lehečková 1975*) and Cheb (*Šebesta 1979*) and of general information about finds of glass from Prague (*Olmerová 1977*; *Janská 1982*), a typological-chronological overview of Czech glass was elaborated, but only to the end of the 15thcentury (*Hejdová 1975*; *Hejdová – Frýda – Šebesta – Černá 1983*; *Frýda 1990*). The only finds from the time between 1500 and the middle of the 16thcentury which were published were from the castles in Radyně, in the district of Klatovy, and Toužim, in the district of Karlovy Vary (*Frýda 1979*), and later smaller collections from the castles in Rabí, Gutštejn and Klenová, all of which are in western Bohemia (*Frýda 2000*). Later material appears in work on mediaeval glass from Kutná Hora (*Lehečková 1975*), is mentioned in Most (*Černá 1997*), or is published as part of a feature with material from a longer period of time (Klatovy – *Vondráčková 1996*; Tábor – *Krajíc et al. 1998*). As in the case of the earlier period, no collective evaluation was carried out.

Up until recently, only representative examples from Brno in Moravia (*Himmelová 1990*; *Chamonikola ed. 1999a*, 582-3) and from Opava (*Král 1964*; *Chamonikola ed. 1999b*, 223-5) were published. From Olomouc, a smaller collection from one cesspit (*Drobný – Sedláčková 1997*) and individual pieces from several features in the historical town centre have been published (*Sedláčková ed. 1998*).

The exhibition "From the Gothic Period to the Renaissance 1400–1550", held in Brno, Olomouc, and Opava in 1999, presented the public with representative examples of blown glass dating from this period and originating in the cited towns as an integral part of their material culture (*Hlobil – Perůtka ed. 1999*; *2002*; *Chamonikola ed. 1999a*; *1999b*). Inspired by this exhibition, I gathered all available, thus usually published, evidence of archaeological finds of glass from Moravia, broken down into glass from the Gothic period (central and northern Moravia, *Sedláčková 2001*) and early Renaissance glass from the first half of the 16th century

(*Sedláčková 2000*). At that point, the situation appeared as it was earlier assumed to be: between the second half of the 15th century and the middle of the 16thcentury glassmaking waned, evidently as a result of the overall economic decline following the Hussite wars. This was observed in Moravia and Bohemia (*Himmelová 1990*, 442; *Černá 2002*, 108-109).

This finding seemed to be in complete contradiction to the boom in glass production that occurred at that time in Italy and in the majority of the lands in Central Europe, where glassmaking became an important industrial sector.

In subsequent years, when I was working intensively on analysing glass from Brno, Opava and the Moravian castles, the occurrence of glass found in Moravia between the middle of the 15th and the middle of the 16th century took on a considerably different appearance. In Brno, over 30 whole pieces with roughly seven hundred specimens of blown and window glass from that period were found, and finds from earlier excavations in Opava were subjected to a detailed analysis with corrected dating (*Sedláčková 2004*), and a relatively well-dated collection from the Cvilín Castle at Krnov was evaluated (*Sedláčková 2004a*). As part of work on research project run under J. Bláha entitled "Material Culture in the Late Gothic and Early Modern Periods in Olomouc in the Light of Archaeological Findings" (GA04/00/0492), I worked on three important Olomouc collections, two of which were deserted in 1540 and the third dated from a time before the first half of the 16th to the first decades of the 17th century (*Sedláčková 2000a*; *2000b*; *2002*). A portion of glass finds from Anabaptist sites in southern Moravia, rising here from 1526, were dated to the second quarter of the 16th century (*Sedláčková 2001a*; *2003*).

Based on the material gathered, it was possible to formulate a general description of glass from this period and also to observe a gradual change in style. This is manifested first of all in the use of new decorative elements, in a change in the shapes of older types, and in the emergence of new shapes of vessels. This process peaked sometime around 1550, the finds from that time being almost exclusively a Renaissance style of glass. The number of features with glass from this period and the number of specimens of vessels found in them also overturns previous opinions about a decline of glassmaking, at least in Moravia.

I was also forced to reassess my earlier opinions about the origin of the glass. Today it is clear that a large portion of the glass that I previously regarded as imports from German glassworks came from domestic glassworks, apparently in northern Moravia. In Brno and Olomouc, especially at least two spheres of production can be observed in the different types of glass content. The smaller group is made up of products from Germany, Italy, evidently also Lower and Upper Hungary, and finally also Tyrol and Lower Austria. In many cases, it was possible to observe the effects of advanced European glassmaking on domestic glass.

The content of cesspits and wells that have been used secondarily for depositing waste is usually dated on the basis of an analysis of ceramics and stratigraphic relations, but this does not facilitate a more accurate dating. However, in some cases it is possible to base the dating of collections on unearthed coins, written reports, and more recently also on dendrochronological data. The types of glass from these collections dating from between circa 1450 and 1560 represent a very good example of the gradual transition of late Gothic production to pure Renaissance forms, and at the same time they offer a chronological classification of the other finds, and therefore this paper devotes primary attention to these collections.

II. A list of features, their identification and dating, and basic literature

Processed finds from Brno, Olomouc, and Opava have been entered into a database entitled "SKLO" (MS ACCES 2000), which was created by M. Peška at the company Archaia Brno. Given the various methods used to inventory materials at different institutions and the varying quality of the resulting inventories, and with a view to the preparation of a publication on archaeological glass finds in Moravia, in this database I used the unified system of catalogue numbers, which are presented in this paper.

- Brno:

- Če3-1-3: Česká Street no. 5, feature 3/85 (end of the 15th century), Městské muzeum Brno, not inventoried, *Himmelová 1990*, 442, fig. 2: 5; *Sedláčková 2006*, fig. 3: 7.
- D617-01-58: Dominikánská Street no. 3, feature 617/00, layer K 1211 (16th century), Městské muzeum Brno, inv. no. 203 428, *Merta – Zapletalová – Zůbek 2001*; *Sedláčková 2006*, fig. 10: 10.
- D638-01-24: Dominikánská Street no. 5, feature 638/00, upper layer K 1291 (1500-1550), Městské muzeum Brno, inv. no. 207 491/1, 2, 207 492/1-19, 207 493/1, 2, *Merta – Zapletalová – Zůbek 2001*; *Sedláčková 2006*, fig. 10: 9.
- D54-01-51: Dominikánská Street no. 15, feature 54/85 (1450-1500), Městské muzeum Brno, inv. no. 401 199-232, *Himmelová 1990*, 442, fig. 3: 1; *Sedláčková 2006*, fig. 10: 3.
- D12-001-094: Dominikánské Square no. 12, feature 9/90, layer 115-135 cm (1500-1550), Městské muzeum Brno, not inventoried, *Procházka – Himmelová 1995*; *Himmelová – Procházka 1995*; *Chamonikola ed. 1999a*, cat. no. 311; *Sedláčková 2000*, cat. no. II-4.1.1; *Sedláčková 2006*, fig. 12: 2.
- Ja1018-01-29: Jakubská Street no. 4, feature 1018/90 (1450-1550), Městské muzeum Brno, inv. no. Ul 76/Sk-91, 78/Sk-923, 79/Sk-1, *Sedláčková 2006*, fig. 9: 13, 10: 4, 13.
- Jos7S3-1: Josefská Street no. 7, trench 3, section 3, layer 4a/89 (according to Z. Himmelová, 15th century), Městské muzeum Brno, not inventoried.
- Kob105-1: Kobližná Street no. 4, cesspit VS4/99 (16th century), Městské muzeum Brno, inv. no. 098/99-105-1, *Merta – Peška 1999*; *Sedláčková 2000*, cat. no. II-1.5.1.
- Kob150-1: Kobližná Street no. 4, layer K150/99 (circa 1500?), Městské muzeum Brno, inv. no. 098/59-150-1, *Merta – Peška 1999*; *Sedláčková 2000*, cat. no. II-1.3.1.
- Kob4-01-55: Kobližná Street no. 4, cesspit 154/99 (1400-1450), Městské muzeum Brno, inv. no. 098/59-0154/055, *Merta – Peška 1999*; *Sedláčková 2000*, cat. no. II-1.4.1; *Sedláčková 2006*, fig. 8: 10.
- Ko4-1,2: Kozí Street, lot 54, feature 4/87 (circa 1500), Městské muzeum Brno, not inventoried, *Himmelová 1990*, 442, 444, fig. 5: 4, 5; *Chamonikola ed. 1999a*, cat. no. 309, 310; *Sedláčková 2000*, cat. no. II-2.4.1; III-5.5.1.
- Stf-1: old stocks (1500-1550), Městské muzeum Brno, inv. no. 6529, *Sedláčková 2006*, fig. 11: 11.
- Me1-01-15: Mečová Street no. 2, feature 1/89 (circa 1550, dated by Z. Himmelová), Městské muzeum Brno, not inventoried.
- Me4-001-016: Mečová Street no. 2, feature 4/90, upper layer 1, 0-210 cm (circa 1550 and later), Městské muzeum Brno, not inventoried, *Procházka – Himmelová 1995*, 241; *Himmelová – Procházka 1995*.
- Me7-01-23: Mečová Street no. 2, feature 7/90 (to circa 1475), Městské muzeum Brno, inv. no. 423 691-423 710, *Černá ed. 1994*, cat. no. 74, 133; *Procházka – Himmelová 1995*, 239; *Himmelová – Procházka 1995*; *Chamonikola ed. 1999a*, cat. no. 306; *Sedláčková 2000*; *Sedláčková 2006*, fig. 8: 4, 5, 9: 6.

- Me17-01-51: Mečová Street no. 2, feature 17/90, layer 240-360cm (1450-1550), Městské muzeum Brno, inv. no. 249 271-311, *Procházka – Himmelová 1995*, 241; *Himmelová – Procházka 1995*; *Sedláčková 2000*, cat. no. II-4.2.1, 6.1.1; *Sedláčková 2006*, fig. 10: 11.
- Me546-1-5: Mečová Street no. 4, feature 546/00 (circa 1400-1500), Městské muzeum Brno, inv. no. 201 414, 201 415, 201 416/1-3, *Merta – Zapletalová – Zůbek 2001*.
- Me592-1-8: Mečová Street no. 4, feature 592/00 (circa 1500-1600), Městské muzeum Brno, inv. no. 206 042/1-2, 202 198/1-3, 205 352/1-3, *Merta – Zapletalová – Zůbek 2001*; *Merta – Peška – Zůbek 2003*; *Jordánková – Loskotová – Merta 2004*, 586.
- MK5-01-37: Minoritská Street no. 1 (Minorite monastery), feature 5/88-90 (16th century), Městské muzeum Brno, inv. no. 435 176-184 and not inventoried, *Procházka 1993*, fig. 4.
- NS115-01-12: Náměstí svobody (Freedom Square) no. 1, feature 115/05 (1500-1550), Městské muzeum Brno, inv. no. 30/05-115/-340, 369, 370, 372-374, *Polánka – Sedláčková – Zůbek 2006*.
- NS133-01-17: Náměstí svobody no. 1, feature 133/05 (1450-1500), Městské muzeum Brno, inv. no. 30/05-133/95-106, *Polánka – Sedláčková – Zůbek 2006*.
- NS521-01-20: Náměstí svobody no. 9, feature 521/04 (1455 - circa 1480/90), Městské muzeum Brno, inv. no. 69/04-150/90, 95-103, 69/04-161/114, *Holub – Sedláčková 2005*; *Sedláčková 2006*, fig. 10: 1, 2.
- DPL504-01-24: Náměstí svobody no. 17, feature 504/00 (16th century), Městské muzeum Brno, inv. no. 191/00-162/252-258, 350/65, 66, *Peška – Zapletalová 2001*; *Merta – Peška – Sedláčková 2002*, 362-363, cat. no. I-3-27, figs. 6 and 7.
- DPL510-1,2: Náměstí svobody no. 17, feature 510/00 (16th century), Městské muzeum Brno, inv. no. 191/00-118/12, 13, *Peška – Zapletalová 2001*; *Merta – Peška – Sedláčková 2002*, 363, cat. no. I-28,29, fig. 7.
- DPL531-001-103: Náměstí svobody no. 17, feature 531/00, layers K158 and 267 (16th century), Městské muzeum Brno, inv. no. 191/00-158/276-1-33, 267/242-244, *Peška – Zapletalová 2001*; *Merta – Peška – Sedláčková 2002*, 362; *Sedláčková 2006*, figs. 11: 8, 9, 12: 1, 4.
- Or10-01-40: Orlí Street no. 10, cesspit X (circa 1450-1500), Městské muzeum Brno, inv. no. 327 401-327 421.
- Pa502-1-5: Panenská Street, lot 501/1, feature 502/99 (1450-1500), Městské muzeum Brno, inv. no. 99/004-141/1, 162/26-27, 163, *Merta 1999a*; *Merta – Peška – Sedláčková 2002*, 368, cat. no. II-35-39, fig. 11; *Sedláčková 2006*, fig. 12: 10, 11.
- Pa503-1-3: Panenská Street, lot 501/1, feature 503/99 (1500-1550), Městské muzeum Brno, inv. no. 99/004-133/1-3, *Merta 1999a*; *Merta – Peška – Sedláčková 2002*, 368-369, cat. no. II-40-42, fig. 11.
- Pet1-001-095: Petrov no. 2, feature 1/94, layers K 113 and 231 (1500 – circa 1560) = Pet1-001-034; layer K 232 (circa 1450-1500) = Pet1-035-095, Městské muzeum Brno, inv. no. 18/94-113/97-120, 231/334, 335, 339-342, 232/105-128, 137, 138, *Procházka 1996*; *Sedláčková 2006*, fig. 8: 9, 11: 1, 2, 3, 7, 11a.
- Ra513-1-5: Rašín Street no. 6, feature 513/97 (1500-1550), Městské muzeum Brno, inv. no. 30/97-136/19-1-5, *Sedláčková 2006*, fig. 11: 10.
- Stb2-1-3: Starobrněnská Street no. 2, feature X, layer 435 (circa 1500-1550), Městské muzeum Brno, not inventoried, *Merta 1999a*.
- Stb5-01-22: Starobrněnská Street no. 5, cesspit X (1450-1500), Městské muzeum Brno, inv. no. 323 379-463, *Cejnková 1986*; *Sedláčková 2006*, fig. 10: 5.
- Zt6-1: Zelný trh Square no. 9, feature 6/87 (circa 1500), Městské muzeum Brno, not inventoried, *Himmelová 1990*, 442, fig. 3: 5; *Chamonikola ed. 1999a*, cat. no. 308; *Černá ed. 1994*, cat. no. 77; *Sedláčková 2000*, cat. no. II-1.1.1; *Drahotová et al. 2005*, chap. 2, colour suppl. 5; *Sedláčková 2006*, fig. 11: 5.
- ZtX-1-3: Zelný trh Square no. 9, feature X/88, collections from disturbed cesspits (circa 1500-1550), Městské muzeum Brno, not inventoried, *Sedláčková 2000*, cat. no. IV-1.11.1.

Note 2:
Layer K 166 was identified additionally as a part of the fill of the cesspit no. 501/00 in Dominikánská Street no. 7 (D07501-17). There is the original, wrong indication left in this text.

- VŠ166-1: Velký špalíček, layer K 166 (1450-1500), Městské muzeum Brno, inv. no. 200 705.[2)]
- VŠ3107-01-10: Velký špalíček, layer K 3107 (circa 1550-1600), Městské muzeum Brno, inv. no. 208 142-148, *Merta – Zapletalová – Zůbek 2001*; *Sedláčková 2006*, fig. 12: 14.

- Olomouc (all the finds are deposited in National Institute of the Care of Monuments, Olomouc):

- OlDN7-1-5: Dolní Náměstí (Lower Square) no. 7, cesspit 1/96, layer 210-285 cm (15th century), *Sedláčková 2001*, cat. no. 3.3.1-4.
- OlDN20-01-16: Dolní Náměstí no. 20, cesspit 12/96 (circa 1490-1560/70), *Drobný – Sedláčková 1997*; *Drobný – Sedláčková 1997a*; *Sedláčková ed. 1998*, cat. no. 04.1-1-4; *Sedláčková 2000*, cat. no. II-1.8.1-2, II-8.1.1, III-1.1.1, III-2.2.1, III-3.3.1, III-7.1.1, IV-1.3.1 8; *Sedláčková 2001*, cat. no. 3.4.1; *Sedláčková 2006*, fig. 11: 17-19.
- OlHr1-1: Hrnčířská Street no. 42, feature 1/93 (end of the 15th century), *Sedláčková 2000*, cat. no. II-9.2.1; *Sedláčková 2006*, fig. 11: 15.
- OlHr7-001-504: Hrnčířská Street no. 42, feature 7/93 (before the middle of the 16th – start of the 17th century), *Sedláčková ed. 1998*, cat. no. 07.2,3; *Bláha 1999*, cat. no. 581; *Sedláčková 2000*, cat. no. II-2.3.1, III-4.4.1, IV.1.5.1-15; *Sedláčková 2000b*; *Drahotová et al. 2005*, chap. 3, colour suppl. 16; *Sedláčková 2006*, fig. 11: 20, 12: 8.
- OlPa124-01-20: Pavelčák Street no. 22, feature 124/95 (layers 3-7 before the middle of the 15th century, layers 9-15 from the second half of the 15th century, upper fill, first half of the 16th century), *Bláha 1999*, cat. no. 577, 578; *Sedláčková 2000*, cat. no. IV-1.8.1-3; *Drahotová et al. 2005*, chap. 2, colour suppl. 3; *Sedláčková 2006*, fig. 9: 7-11.
- OlPa55-01-13: Pavelčák Street no. 22, feature 55/95 (circa 1500-1550), *Sedláčková ed. 1998*, cat. no. 15.1-1; *Sedláčková 2000*, cat. no. III-6.1.1, IV-1.6.1-13.
- OlPa79-01-19: Pavelčák Street no. 22, feature 79/95 (circa 1500-1550), *Bláha 1999*, cat. no. 582; *Sedláčková 2000*, cat. no. IV-1.7.1-19; *Sedláčková 2006*, fig. 12: 7.
- OlRie-1-6: Riegr Street no. 11, cesspit 151/77 (end of the 15th – start of the 16th century), *Sedláčková ed. 1998*, cat. no. 18.1-1; *Bláha 1999*, cat. no. 580; *Sedláčková 2000*, cat. no. I-1.1.1, II-10.1.1; *Sedláčková 2001*, cat. no. 3.11.1-4; *Sedláčková 2006*, fig. 11aa.
- OlPrI-001-104: 8. května Street, cesspit I/73 (circa 1490-1540), *Bláha 1998*, 151, fig. 8: 6; *Sedláčková ed. 1998*, cat. no. 13.1-1; *Bláha 1999*, cat. no. 579; *Sedláčková 2000*, cat. no. II-1.9.1, II-2.1.1, II-8.2.1, IV-1.1.1-4; *Sedláčková 2001*, cat. no. 3.12.1-3; *Sedláčková 2002*; *Drahotová et al. 2005*, chap. 3, colour suppl. 17; *Sedláčková 2006*, figs. 11: 6, 12: 9, 12.
- OlPrV-1: 8. května Street, cesspit V/73 (Renaissance cesspit with an earlier material mixed in), *Sedláčková ed. 1998*, cat. no. 13.2-1; *Bláha 1999*, cat. no. 583; *Sedláčková 2000*, cat. no. IV-1.1.1-2; *Drahotová et al. 2005*, chap. 3, colour suppl. 18; *Sedláčková 2006*, fig. 12: 6.
- OlŽN2-001-300: Žerotín Square no. 2, feature 2/82, (end of the 15th century–circa 1540), *Sedláčková ed. 1998*, cat. no. 19.1-1; *Sedláčková 2001*, cat. no. II-7.1.1; *Sedláčková 2000*, cat. no. II-2.2.1, II-9.1.1, IV-1.9.1-2; *Sedláčková 2000a*; *Sedláčková 2006*, fig. 11: 16.

- Opava:

- OpČS-1: Horní Náměstí (Upper Square) – Česká spořitelna, cesspit 1/93 (end of the 16th century–first decades of the 17th century), Národní památkový ústav Ostrava, Opava office, *Sedláčková 2000*, 174, fig. 5: 2.
- OpKo3-1-3: Kolářská Street, feature 3/60 (1450-1500), Uměleckoprůmyslové museum Praha, inv. no. 77 394, Slezské zemské muzeum Opava, inv. no. U 720, 721 S, *Baumgartner – Krueger 1988*, cat. no. 371; *Chamonikola ed. 1999b*, cat. no. 109-111; *Sedláčková 2004*, 224-226, fig. 2, 3; *Sedláčková 2006*, fig. 10: 6, 7.

- OpKo1A-1,2: Kolářská Street, feature 1A/63 (1500-1550), Slezské zemské muzeum Opava, inv. no. U 723, 724 S, *Král 1964*; *Chamonikola ed. 1999b*, cat. no. 115, 116; *Sedláčková 2000*, cat. no. II-3.1.1, 2.2.1; *Sedláčková 2004*, 229, fig. 8B; *Sedláčková 2006*, fig. 12: 3, 5.
- OpKo3A-1-7: Kolářská Street, feature 3/63 (1450-1500), Slezské zemské muzeum Opava, class. no. 63/51-55, *Sedláčková 2004*, 230, fig. 4B.
- OpKo12-001-114: Kolářská Street, feature 12/63 (circa 1490-1560), Slezské zemské muzeum Opava, class. no. 63/82-92, *Sedláčková 2004*, 237-240, fig. 8A, 9.
- OpMa-1-6: Masařská Street no. 6, feature 5/94 (circa 1450-1500), Národní památkový ústav Ostrava, Opava office, *Teryngerová 1995*; *Sedláčková 2001*, cat. no. 4.1.1-6; *Drahotová et al. 2005*, chap. 2, colour suppl. 12.

• Other localities:
- Cvi001-137: Cvilín Castle at Krnov, district of Bruntál, Slezské zemské muzeum Opava, class. no. 124/54, *Sedláčková 2004a*; *Sedláčková 2006*, fig. 11: 4, 12: 15, 16.
- Me-1,2: Melice – castle, Vyškov District (before 1423), Muzeum Vyškov, inv. no. H 12 090-093, H 12 509, H 12 511-530, H 12 532, *Himmelová 1997*, 220, fig. 2: 1, 2; *Sedláčková 2006*, fig. 7: 2, 3.
- Pou-01: Pouzdřany, Anabaptist courtyard, *Sedláčková 2003*; *Sedláčková 2006*, fig. 11: 12.
- Pro-1: Prostějov, trench dig at the Augustinian monastery in 1975 (circa 1450-1500), Muzeum Prostějov, *Prudká 1982*; *Sedláčková 2001*, cat. no. 5.5.1; *Drahotová et al. 2005*, Chap. 2, colour suppl., fig. 7; *Sedláčková 2006*, fig. 10: 8.
- Str-001-0025: Strachotín, Břeclav District, Anabaptist estate, Muzeum Mikulov, *Sedláčková 2000*, cat. no. II-4.3.1-3, II-5.1,2, II-9.4.1; *Sedláčková 2001a*; *Sedláčková 2006*, fig. 11: 13, 14.

III. Description of an assemblage dated by coins[3)], dendrochronologically and by written sources

Note 3:
I would like to thank Rudolf Procházka for providing a list of coins identified by J. Šmerda from the Moravské zemské muzeum.

Brno, Mečová Street no. 2, feature 7/90 – before the last third of the 15th century (Me7-01-23)

This is a cesspit on a rectangular layout, built with a mortared stone screen wall and on an irregular ground plan of 180 x 66 x 168 x 70 cm. It had a preserved depth of 294 cm and an original depth of circa 400 cm. Three layers were distinguished in the fill. The upper layer with construction debris to a depth of 90 cm contained fragments of glass (Me7-01-06) and window discs with a sealed rim (Me7-19-22). In the next layer to a depth of 175 cm - at the 90-110 cm level - a pocket of dark grey clay with glass finds was unearthed (Me7-07-09 and 023 – a green glass coral/bead) along with 28 coins: three hellers of the Margrave Jošt (1375-1391), 18 square coins of the Margrave Jošt (1400), a Hungarian coin of Zikmund (the period to 1426), a pfennig of Hans Leuchtenberg and his successors (1407-1443), a coin with a lion on it (Bohemia or Kłodsko, circa 1450), a pfennig of Ulrich of Flochberg (Oetingen 1423-1477), a pfennig of Albrecht V (Vienna, after 1416), a pfennig of the Emperor Friedrich V (New Town – Vienna, 1457-1460), and the last two fragments are unidentifiable. In the same layer, beneath the pocket, there were fragments (Me7-10-16) and beakers with drawn drops; it can therefore be assumed that it is older, just like the layer of crumbling mortar over the base, with the nape of the jug (Me7-17-18).

Finds of fragments of silver metal and tools, like a hammer and crucibles, indicate that the cesspit was used at a time when a mint was operating on the lot, dated to 1411 (*Procházka – Himmelová 1995*, 239, figs. 4, 6: 3; *Himmelová – Procházka 1995*).

Brno, Minoritská Street no. 1, Minorite monastery, feature 5/89 – circa the middle of the 16th century (MK5-01-37)

The pit served as a dump for the monastery kitchen (*Procházka 1993*, fig. 4). In the layer 20 cm above the bottom, a Polish denar bearing the symbol of the town of Wschow from 1550-1562 was found. Blown glass finds, among which only an unearthed kuttrolf has a late Gothic shape, corresponds to this dating (MK5-22). This site provided the only evidence thus far of distillery instruments in Brno – the fragments of two thick-walled pipes (Mk5-08, 10, 14, 32, 33). However, window plates with traces of painting may be of mediaeval origin (MK5-13, 30), and discs with a sealed edge were found here (MK5-18, 27), as were ones with a folded rim (MK5-03, 12, 35) and even material chipped off of discs were found (MK5-34).

Brno, Náměstí svobody no. 9, cesspit 521/04 – the pit originated after 1455, and fell into decline circa 1480/90 (NS521-01-20)

This timbered cesspit was located on a lot on the eastern side of one of the main squares in Brno. The well-preserved frame structure provided dendrochronological data, which made it possible to date the construction of the cesspit to the period around 1455. In the cesspit fill (K 150, 161 a 162), there were finds of ceramics from the 15th century, wooden products, and a collection of blown glass. It is estimated that the cesspit was in use for a period of 30 to 50 years; its desertion would therefore lie in the last quarter of the 15th century. A find of six wooden shoemaking lasts permits the assumption that a shoemaking craft was carried out on the lot (*Holub – Sedláčková 2005*, 7).

A smaller assemblage of glass, in terms of number, found in layers K 150 and 161 comprised six to seven vessels and fragments of two window discs (NS521-01-20, discs 12 and 20). Fragments of some small vessels were also obtained from both layers.

Petrov 2, cesspit 1/94, layer K 232 – late 15th century, layers K 113 and K 231 – beginning of the second half of the 16th century (Pet1-001-095)

In connection with a survey of the underground area and stability of building nos. 2 and 8 on Petrova Street, a mediaeval cesspit was unearthed, which had been covered with building masonry dating from 1777. The cylindrical feature with a diameter of 1.9–2.1 metres and a depth of 3 metres was walled with a stone screen wall. The fill could be divided into three horizons: the bottom layer K 233 dated from the first half of the 15th century (a depth of 210-300 cm, Pet1-096-340), layer K 232 dated from the late 15th century (a depth of 150-210 cm, Pet1-035-095). The youngest horizons, K 113 and 231, (a depth of 0-150 cm, Pet1-001-034) contained coins: a white coin of Ludwig Jagello was found in layer K 113 (Czech lands, 1516-1526), a zweier of the Archbishop Ernst of Bavaria was found in layer K 231 (Salzburg, 1540-1554), along with a white coin of Ferdinand I (Kutná Hora, 1540s) and three false groschen loosely copying the groschen of Vladislav Jagello (1471-1516 – *Procházka 1996*, 2).

The cesspit also contained the largest assemblage of blown glass in Brno. Most of the finds came from the layers dating from the 15th century. In the layers with the dated coins there were only 34 specimens of blown and window glass, but other specimens were found in the lower layers. The contents of the cesspit had been considerably mixed together, evidently as a result of repeated cleaning, which is evident from the sharp temporal divides between the individual horizons and the relatedness of fragments between vessels from different layers (e. g. the upper part of a beaker with a slanted moulding in layer K 231 and the lower part in layer K 232 – Pet1-028 and 038), or even finds of later-dated glass in an older layer.

Olomouc, Dolní Náměstí *no. 46/20, cesspit 12/96 – until the 1560s (OlDN20-01-16)*

A cesspit with a trapezoidal layout, lined with stone and 290 cm deep, was unearthed in the courtyard of lot no. 443. To a depth of 270 cm, there was a fill of debris deposited at one time containing fragments of sandstone moulding and small fragments of Renaissance goblets, window glass, and coins. The youngest coin is a pfennig of Archbishop Michael Khunburg of Salzburg (1540-1560) from 1556. Older glass was found in the lower part of the debris and in the remains of the original septic fill, including a small late Gothic beaker, Olomouc-type beakers, a beaker with optical decor, rosary rings, and three goblets made in a Tyrolean workshop in Hall. The goblets were originally dated to the 1560s (*Sedláčková ed. 1998*, cat. no. 04.1-1, 2). Based on the subsequent discovery of an analogical find of one "Luther goblet" it was necessary to shift the dating to the 1530s-1540s (*Reformation 1983*, cat. no. 607).

Olomouc, 8. května Street, lot no. 473 (construction site of the Prior department store), feature I/73 – until circa 1540 (OlPrI-001-104)

During an excavation on the lot of the former Latin school At St. Moritz in 1973, a cesspit was uncovered in the courtyard on the southwest part of the lot. The contents of the cesspit were deposited from the end of the 15th century and the *terminus ante quem* is provided by written sources on the reconstruction of a school in 1538-1541. Discovered in the cesspit were some unique examples of school supplies and tools, such as a fragment of a Latin textbook, a wooden writing board with a wax surface, and the fragment of another wooden inkpot and stylus. Among the standard utility ceramics, a large fragment of a jug with variously coloured glazes and decoration in relief was found as was a set of small crucibles with traces of verdigris (*Bláha 1999*, 616-626).

Blown and window glass was found in several layers of the fill: to 20 cm (OlPrI-025-056), -30 cm (OlPrI-057-059), 20-40cm (OlPrI-060-073), 40-60 cm (OlPrI-074-090), 60-70 cm (OlPrI-091-098), 60-80 cm (OlPrI-099-101), and the depth for the final fragments was not indicated.

Finds from the "superelevation" (OlPrI-001-024) date from the period around 1600 and have no connection to the content of the cesspit; nevertheless, an Olomouc-type beaker was found in the bottom part (OlPrI-017). Part of an hourglass (OlPrI-011, 039, 047, 051) was assembled with finds from the fill.

In terms of style, the glass content revealed two groups – a late Gothic style of glass and products signalising the arrival of the Renaissance. The first group includes fragments of several late Gothic varieties of beaker, Olomouc-type beakers, a small beaker, the base of which is wrapped around with a pinched thread, and a ribbed bottle, two Stangenglas beakers (OlPrI-054, 064), a small beaker with an optical decor of rose cuts (OlPRI-068), and a kuttrolf (OlPrI-069).

The second group is represented by a goblet with a funnel-shaped bowl (OlPrI-049), a small beaker or goblet with a foot made of coiled spiral thread (OlPrI-053), a square bottle with an optical ribbed decoration and a remarkable set of laboratory glass (OlPrI-038, 52, 67, 82, 83).

Olomouc, Žerotín Square no. 2, well 2/82 – before circa 1540 (OlŽN2-001-306)

In the farmyard section of the St. Michael Dominican monastery, a well walled with stone and with an inner diameter of around 200 cm was unearthed and excavated to a depth of 860 cm. Based on the numerous finds of coins, the well must have been used as a cesspit in the 1540s. Alongside a large assemblage of ceramics, tiles, and evidence of literacy (stylus), it also contained a large assemblage of glass. Most of it (over two hundred pieces) was made up of tiny fragments of window glass.

There were 34 examples of blown glass vessels, also for the most part in tiny fragments. A concentration of finds could be observed in the fill, gathered in 20 cm sections at a time, at the depths of 200-220 cm (OlŽN2-006-011) and 280-300 cm (OlŽN2-027-033), mostly comprising fragments of blown glass. In the layers between 560 and 680 cm, the finds included, almost exclusively, fragments of window discs (OlŽN2-146-292) and the only three vessels made of blue-green glass were found in these layers (OlŽN2-220, 292, 293). The fragments of some vessels came from different layers. Six glass marbles were distributed between the upper layer and the depth of 660 cm (OlŽN2-002, 024, 049, 140, 145, 216). It may therefore be assumed that the assemblage is not an example of typical waste from the domestic functions of the monastery, but that is it a mixture of debris fill, which the glass fragments became mixed up in by chance.

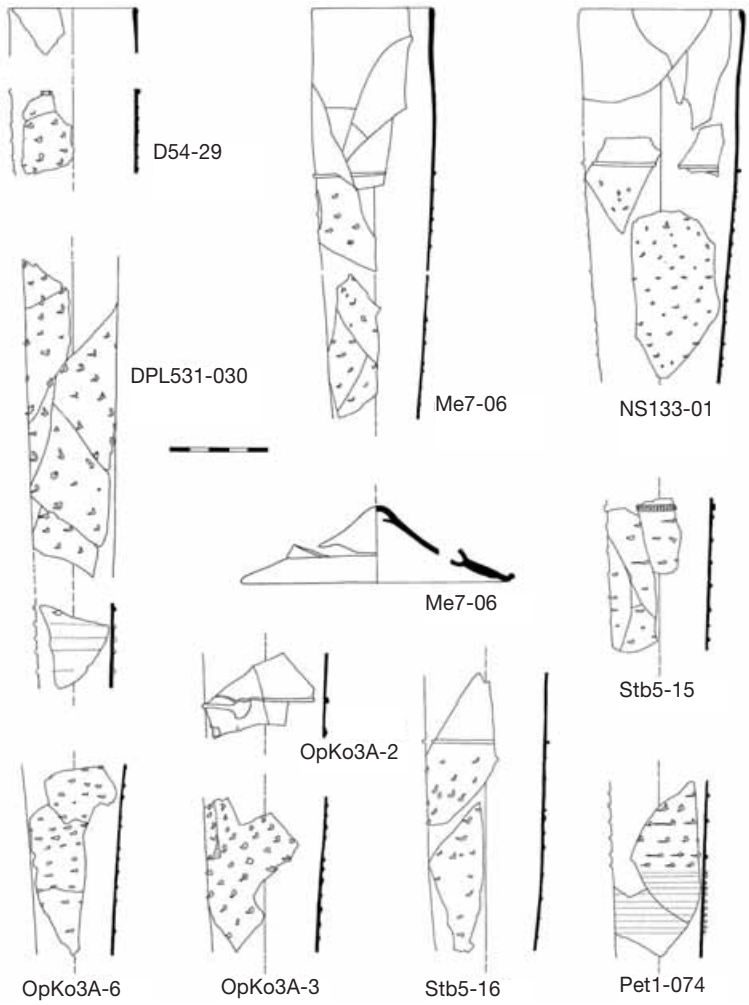


Fig. 1. Tall beakers with crescent-shaped prunts. Second half of the 15th century – first half of the 16th century. *Drawings by H. Sedláčková.*
Obr. 1. Vysoké číše se srpečkovitými nálepy. 2. polovina 15. – 1. polovina 16. století. *Kresby H. Sedláčková.*

IV. Types of glass

IV.1 Glass tableware – tall shapes

- IV.1.1 Late varieties of Gothic beakers (*figs. 1-7*)

We find that, from the middle of the 15th century in Moravia, new decorative elements were applied to tall beakers, replacing the coiled prunts with diameters of 0.5-0.7 cm that had been predominant since the second half of the 14th century. These new elements were mainly small crescent-shaped prunts, sometimes manifested as very small pointed drop prunts. At the same time, there were increasingly more smooth sections on the body, both on the mouth separated by a thread and on the parts above the foot. In some cases, the only decorated part was a relatively narrow strip at the centre of the body of the beaker. Beakers with these types of decorations are often found in Brno and Opava.

These beakers are present in many cesspits from the second half of the 15th century in Brno, sometimes in just individual pieces, other times in large numbers (*fig. 1*: D54-29, Me7-06, NS133-01, Pet1-074, Stb5-15, 16; *fig. 2*: Or10-14; *fig. 3*: Or10-15-18), and in Opava, in cesspits 3/60 and 3/63 on Kolářská Street (*fig. 1*: OpKo3A-2, 3, 6; *fig. 2*: OpKo3-10, 11), and in cesspit 5/94 on Masařská Street no. 6 there were dozens of them (*Sedláčková 2001*, 451, fig. 4: 2-5; *Drahotová et al. 2005*, chapter 2, colour supplement 12). They are even found on rare occasions in Brno, dating to the first half of the 16th century (*fig. 1*: DPL531-030).

Other new decorations on the tall beakers were slanted and coiled moulding with a wheel-pressed decoration. There were one or two examples of these in some features containing beakers with crescent-shaped prunts (*fig. 4*: D54-01, 12, 14, Stb5-18, OpKo3-09; *fig. 5*; Opava, Masařská Street no. 6 – *Sedláčková 2001*, 451). According to the finds in well 1/94 on Petrova Street and in feature 531/00 on Náměstí svobody in Brno, it is not impossible that this type of decorated beaker survived into the first half of the 16th century (*Fig. 4*: Pet1-028, 038, DPL531-009).

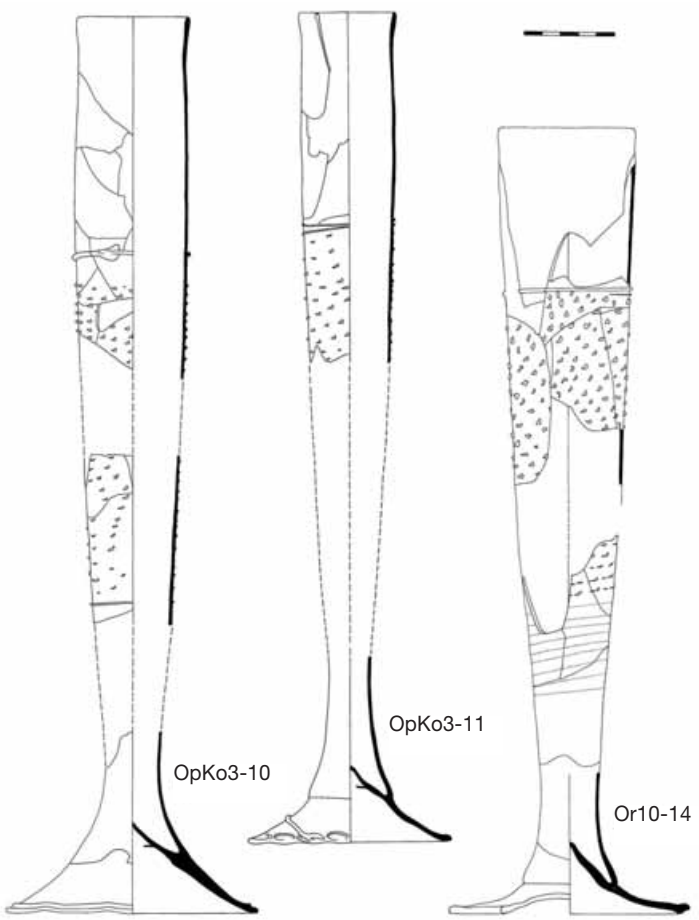


Fig. 2. Tall beakers with crescent-shaped prunts. Second half of the 15th century.
Obr. 2. Vysoké číše se srpečkovitými nálepy. 2. polovina 15. století.

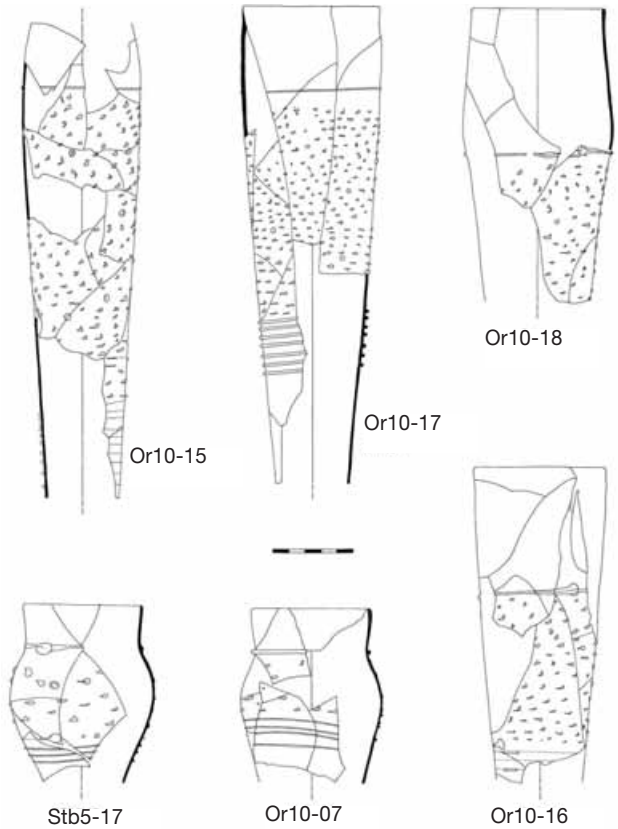


Fig. 3. Tall and low club-shaped beakers with crescent-shaped prunts. Second half of the 15th century.
Obr. 3. Vysoké a nízké kyjovité číše s srpečkovitými nálepy. 2. polovina 15. století.

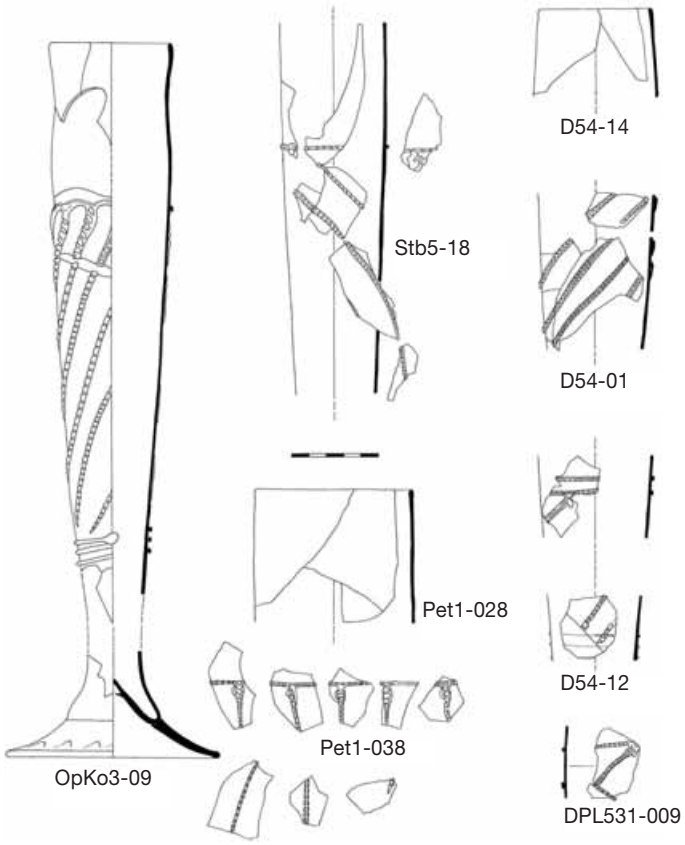


Fig. 4. Tall beakers with slanted mouldings with wheel-pressed decoration. Second half of the 15th – middle of the 16th century.
Obr. 4. Vysoké číše se šikmými lištami promačkávanými radélkem. 2. polovina 15. – polovina 16. století.

Fig. 5. OpKo3-09.
Obr. 5. OpKo3-09.

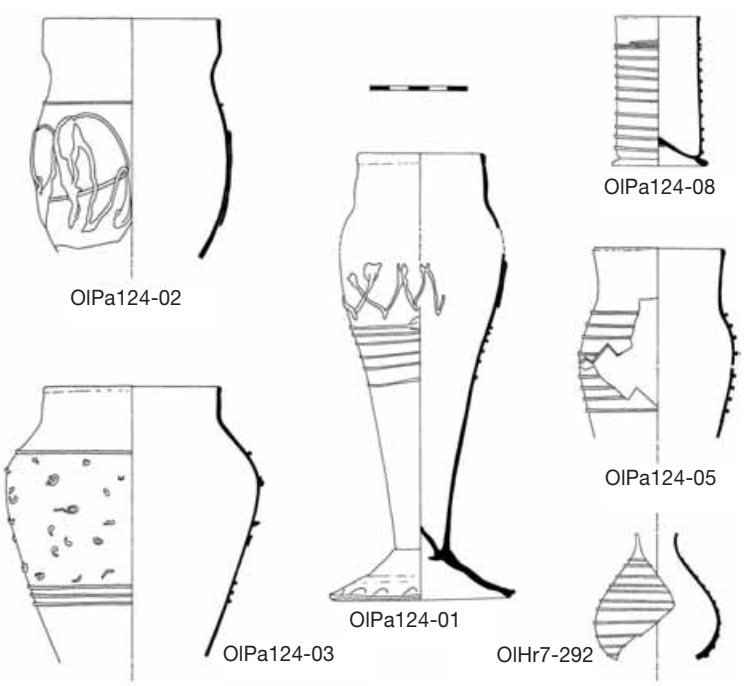


Fig. 6. Vessels decorated with an applied zigzag, wrapped around with thread and crescent-shaped prunts. Shortly before the middle of the 15th century and around the middle of the 16th century (OlHr7-292).
Obr. 6. Nádoby zdobené natavenou klikatkou, ovinutými vlákny a srpečkovitými nálepy. Krátce před polovinou 15. století a ca polovina 16. století (OlHr7-292).

Outside Brno and Opava, these beakers were found in Most, Pilsen, and Tábor, where evidence of them was found in layers dating from the end of the 15th to the start of the 16th century (*Sedláčková 2004*, 244-245). The slanted and coiled mouldings with a wheel-pressed decoration from horizon 1460/70 – 1530/40 form part of the repertoire of decorative features of Rhineland stangenglas and short beakers (*Prohaska-Gross 2002*, Abb. 2).

The shape of the beakers with the crescent-shaped prunts and with slanted mouldings do not differ from the preceding period. These were standard flute-shaped beakers, or less often club-shaped beakers with slightly inturned lips (*fig. 3*: Or10-15). The height of the reconstructed vessels from Brno, Orlí Str. 10, and from Kolářská Street in Opava, is approximately 42-45 cm and the diameter at the foot is 12-14 cm. Occasionally, we can find crescent-shaped prunts even on the shorter, club-shaped beakers with a cylindrical mouth (*fig. 3*: Or10-07, Stb5-17). They were made of light to very light green, impure glass, and were substantially corroded.

The reduction in the size of the prunts to a crescent shape in the 15th century was part of a general tendency in this part of Europe, where tall beakers, both slender and club-shaped, had been popular. The rising demand for glass even among the urban middle classes would have forced glassmakers to produce more products, faster and therefore also more economically. Small crescent-shaped prunts appear on club-shaped beakers in northern Germany (e. g. in Braunschweig – *Bruckschen 2004*, cat. no. 170 and 171, or in Lübeck – *Dumitrache 1990*, cat. no. G 264-266), and in Silesia (e. g. Nysa – *Biszkont 2005*, Tab. 8a; Vratislav – *Biszkont 2005*, Taf. 12).

In Olomouc, just before the middle of the 15th century, short, often pronouncedly club-shaped beakers began to appear with a previously unknown decor applied in the shape of a zigzag, others decorated with a thickly coiled spiral thread or with tiny prunts (*fig. 6*: OlPa124-01- 03, 05; *fig. 7*). Occasionally, late Gothic club-shaped beakers with these kinds of decorations were found in Brno (see *fig. 8*). Also found in Olomouc was a kind of small cylindrical beaker with a thickly coiled thread (*fig. 6*: OlPa124-08), in Brno a beaker with an applied zigzag (*fig. 8*: Ja1018-07; *fig. 9: c*), in Prostějov a jug with a tall cylindrical neck with a coiled thread on a spherical body (*fig. 39*: Pro-1; *fig. 40*: Pro-1). A fragment of a small jug or bottle decorated in the same way was also found in a feature from the 16th century in Olomouc (*fig. 6*: OlHr7-292).

Fig. 7. OlPa124-01.
Obr. 7. OlPa124-01.

- IV.1.2a Late Gothic varieties of small beakers (*figs. 8-10*)

From the turn of the 15th century, small, slender beakers between 20 and 23/24 cm in height begin to predominate. The tall-shaped mediaeval beakers retained their proportions, but were reduced in size to small, delicate shapes. These small beakers were first recorded in Olomouc, where roughly a hundred examples were found, and where they typically feature a so-called lobed foot

(*Sedláčková 2000*, 179-184). Later, another group of small beakers was identified with a bell-shaped foot, a type that included both slender and club-shaped forms. Along with the foot, they differed with regard to their decorative features. I described them as "Olomouc-type beakers" and "small late Gothic beakers".

Small late Gothic beakers were found in Olomouc, Opava and Brno. The bell-shaped foot tends to be shaped by folding back and pincering the lower part of the body and its diameter tends to be around 8 to 11 cm. There are several rows of thread on the foot, or impressions of pucellas (see *fig. 10)*. There are rare examples of a foot with a folded rim on a club-shaped beaker from Opava, created out of the bottom part of the body (*fig. 8*: OpKo1A-1). They are decorated with one or more rows of a fibre wrapped around the body, usually with a wheel-pressed decoration. There is an altogether unique example of a club-shaped beaker pre-blown into a mould from Opava. The glass is often entirely corroded, in beige and brown colours, only a small amount of the original, slightly green glass material, with numerous bubbles and grains of sand, survived.

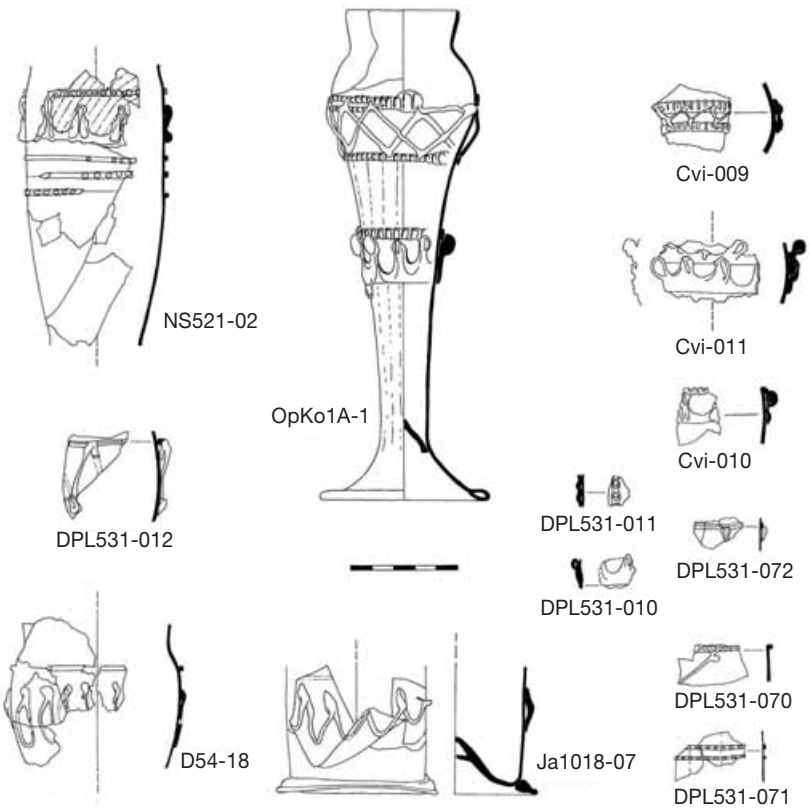


Fig. 8. Beakers decorated with an applied zigzag and garlands. Second half of the 15th – first half of the 16th century.
Obr. 8. Číše zdobené natavenou klikatkou a girlandami. 2. polovina 15. – 1. polovina 16. století.

Because the glass is of such poor quality, we usually only find the bottom part with the foot. It was possible to reconstruct one beaker from Olomouc, where the body widens smoothly towards the top, with a rim diameter of 7 cm, a foot diameter of 10 cm, and a height of circa 23 cm (*fig. 10*: OlPrI-042-044). A bottom part with a diameter of 9.6 cm and a base and foot with a diameter of 11 cm found in the feature evidently belong to the same beakers (*fig. 10*: OlPrI-084, 092). Other finds from Olomouc are known from cesspit 12/96 on Dolní Náměstí 20, where a fragment was found of a lower part of a beaker with a foot with a diameter of 8.6 cm (*fig. 10*: OlDN20-13). A late variety of a flute-shaped beaker was very likely identified in the fill of a well on Žerotín Square no. 2. There is a clear fragment of a bell-shaped foot with traces of pucellas on the circumference and also fragments of a smooth slender body (OlŽN2-003, 013, 142 a 148). In Olomouc, this variety was also found in cesspit 151/77 on Riegrova Street no. 11 (*Sedláčková 2001*, 448).


a


b


c

Fig. 9. a, b) NS521-02 (fragment and close-up of the decoration); c) Ja1018-07.
Obr. 9. a, b) NS521-02 (torzo a detail výzdoby); c) Ja1018-07.

A second reconstructed small beaker with a rim diameter of 6 cm and a foot diameter of 10 cm was found in Brno (*Fig. 10*: D54-11). In this case, the slightly greenish glass of the beaker is covered with a chalk-white, powdery corrosion, which appears relatively often in Brno and on tall beakers or small beakers in other collections from the second half of the 15th century. Evidence of this type is found

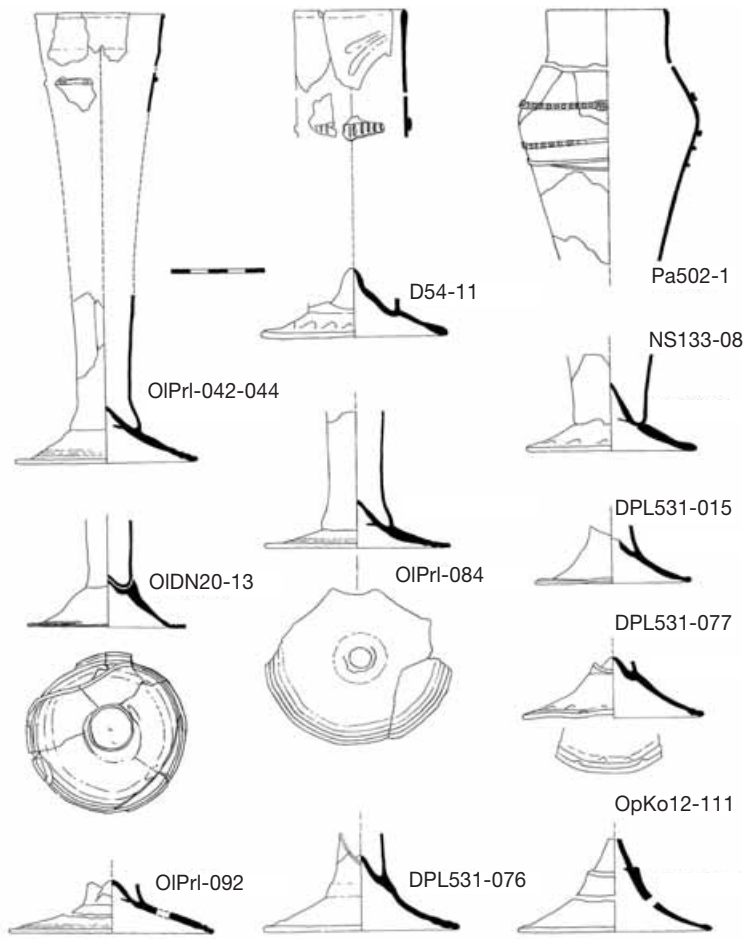


Fig. 10. Small late Gothic beaker. End of the 15th – middle of the 16th century.
Obr. 10. Pozdně gotická drobná číše. Závěr 15. – polovina 16. století.

in the form of small foot and body fragments in feature 531/00 on Náměstí svobody 17 (*fig. 10*: DPL531-015, 076, 077) and in Opava in cesspits 3/63 and 12/63 on Kolářská Street (*fig. 10*: OpKo12-111).

The group of small late Gothic beakers also includes club-shaped beakers. The best-known example is a beaker from Opava, Kolářská Street with an applied zigzag and garlands (*fig. 8*: OpKo1A-1), the closest territorial analogy of which is from the Cvilín Castle at Krnov (*fig. 8*: Cvi-009-011). Fragments of club-shaped beakers with a zigzag, garlands or wrapped around with thread are also present in Brno collections from the second half of the 15th to the middle of the 16th century (*fig. 8*: D54-18, DPL531-010-012, 070-072, Pa502-1).

A unique example is a find from Brno at Náměstí svobody no. 9. A slender beaker that survived in the form of several large fragments of the body, without the rim or base, and which may be an example of the Olomouc type. It has a slender form, the diameter of the body is 6.5 cm, and the height of the fragment is 13.1 cm. On the fragment's upper break there is evidence of the indentation of the neck or a tapering on a club-shaped stretch. The colourless glass is covered with a light-beige glossy corrosion (*fig. 8*: NS521-02; *fig. 9: a, b*).

Three decorative elements customary for late Gothic glass are applied on the beaker from Brno: on the upper part, coiled with thread with a wheel-pressed decoration and with moulding with the tips stretched into garlands, there is optical decoration in the shape of slanted grooves. On the smooth lower part there are three rows of threads, partly with a wheel-pressed decoration.

Garland decorations are a contemporary, fashionable feature, especially popular on German glass. I gathered evidence of its existence in the Czech lands in connection with a club-shaped beaker from Opava (*Sedláčková 2004*, 245-246). The opinion expressed at the time that these may have been products from Silesian glassworks was not confirmed when the complete finds of glass from Silesia were published; among material containing several hundred finds not one example with garlands was found (*Biszkont 2005*).

The use of ribbing as a form of optical decoration is found relatively often on mediaeval glass in Bohemia (*Frýda 1990*, 64, type I.4). In Moravia (in Brno) this technique was encountered up to the last third of the 15th century only on glass imported from the south, primarily on small tapered beakers.

Beakers with optical decorations from Bohemia appeared in Moravia only rarely – I know of only one example from a cesspit on Dominikánské Náměstí in Brno, the contents of which were dated to the period between the end of the 14th and the middle of the 15th century (*Štourač 2005*).

It was only in the final decades of the 15th century that pre-blowing into moulds began to be practised also in Moravian glassworks. This technique was used to make the majority of the Olomouc-type beakers and the beakers with garlands from Opava, and there are also examples of kuttrolfs and ribbed bottles, ribbed domestic beakers, and beakers covered with decorations.

- IV.1.2b Olomouc-type beakers (*figs. 11, 12*)

Typical for Olomouc-type beakers, alongside the lobed foot, is the use of the optical decoration of vertical ribs, only rarely were the surfaces plain (*fig. 11*: OlHr7-284, 288; *fig. 12b*: OlHr7-288). On one fragment there is also evidence of optical decorations with rose cuts (*fig. 11*: OlHr7-232). A common form of decoration is a thread with wheel-pressed decoration, often wrapped in multiple rows around the upper part of the vessel. In one case the thread was made from blue glass (*fig. 11*: ZtX-3; *fig. 12: c*), and in one case decoration with garlands (OlDN20-08). The body of the Olomouc-type beakers widens at an almost straight angle from a relatively wide lower part up to the rim, but there is an example of a beaker with a barrel-shaped body (*fig. 11*: OlPrV-001; *fig. 12: a*) and one beaker with a cylindrical mouth and club-shaped shoulders (*fig. 11*: OlPrI-077). However, it should be noted that there are few fully complete or reconstructed specimens. The lower part and the foot of the beakers have tended to survive well, but of the upper part there are usually only fragments that cannot be reconstructed. The glass material tends to be greenish and impure, according to an analysis of five beakers with a potash-lime composition (*Sedláčková ed. 1998*, 107-108, analyses no. 5, 6, 8-10). However, they are usually heavily corroded.

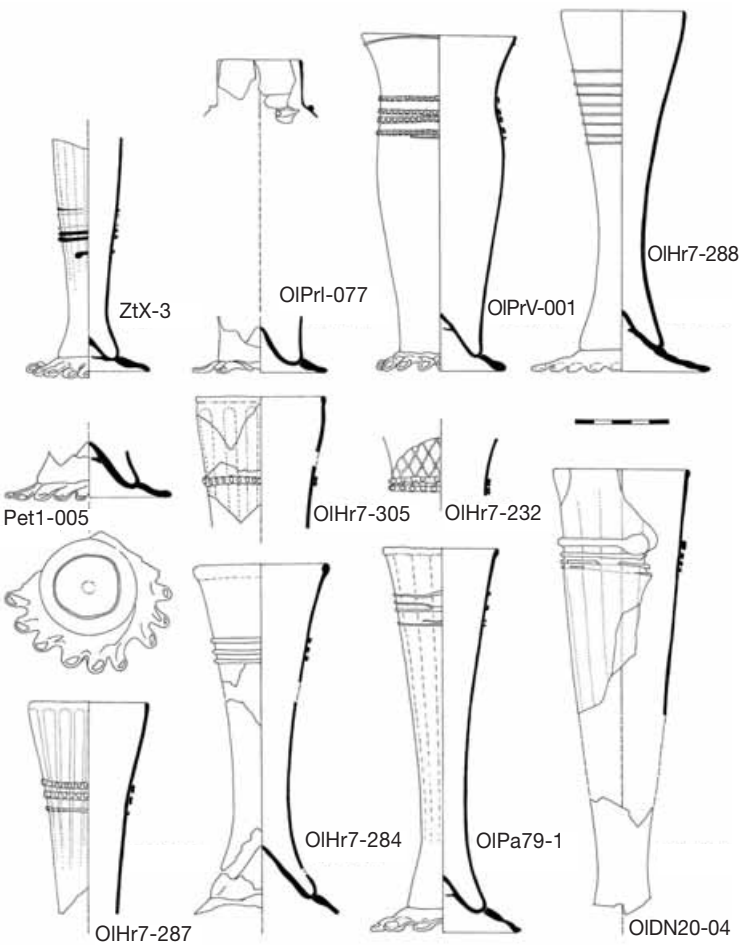


Fig. 11. Olomouc-type beakers. End of the 15th – middle of the 16th century.
Obr. 11. Číše olomouckého typu. Závěr 15. – polovina 16. století.

An inventory of finds of Olomouc-type beakers shows the largest concentration in Olomouc, with some finds also in Brno and at several castles and fortresses (*Sedláčková 2000*, 179-184). There are none in Opava. The Olomouc-type beaker emerged at the same time as a small type of late Gothic beaker around the end of the 15th century, and the joint appearance of the two in Olomouc is documented in the 1540s. The longer duration of the Olomouc-type beaker is indicated from numerous examples found

Fig. 12. a) OlPrV-001; b) OlHr7-288; c) ZtX-3.
Obr. 12. a) OlPrV-001; b) OlHr7-288; c) ZtX-3.

in cesspit 7/93 on Hrnčířská Street in Olomouc (*fig. 11*: OlHr7-232, 284, 287, 288, 305), which dates from he time just before the middle of the 16th to the start of the 17th century (*Sedláčková ed. 1998*, 53-54), just like another cited find of a fragment in Brno at Petrov no. 2, possibly also from the "superelevation" above cesspit I/73 in Olomouc.

A larger collection of glass from the bottom septic layers of cesspit 12/96 on Dolní Náměstí in Olomouc also included evidence of eight Olomouc-type beakers in very fragmented condition. On some fragments, a slightly greenish glass survived, but usually the glass was secondarily opacified. Reconstructed, there were three typical beakers (*fig. 11*: OlDN20-04) and one beaker with a garland decoration on the lower part of the body.

In cesspit I/73 on 8. května Street in Olomouc three examples of the beaker were found (OlPrI-063, 077, 089), and a fourth, lower part was from the "superelevation" (OlPrI-017). In one case, it was possible to reconstruct a beaker with a shape not yet seen before – having a cylindrical mouth and club-shaped shoulders. This beaker and the beaker from the "superelevation" are made of a slightly greenish glass with small corrosion stains, while the glass of the others is corroded all over.

In a well on Žerotín Square, the presence was verified of a fragment of a typical lobed foot and a fragment of a body with optical decoration of rib pattern and applied with thread bearing wheel-pressed decoration (OlŽN2-017, 139).

Several vessels were found in a collection from Petrov no. 2 in Brno that represent the late Gothic heritage, among them the lower part of an Olomouc-type beaker (*fig. 11*: Pet1-005). This is the second find with this shape in Brno. It is interesting that the first known fragment from Brno was from a disturbed cesspit at Zelný trh Square no. 9, which is in the immediate vicinity of Petrov (*fig. 11*: ZtX-3; *fig. 12: c*).

IV.1.2c Stangenglas (*figs. 13-15*)

While the previous shapes represent a change in and culmination of the development of domestic tall beakers, cylindrical beakers with prunts made of a deep blue-green glass is a type that was produced in German glassworks from the end of the 15th to the first half of the 16th century (*Baumgartner – Krueger 1988*, 392). As the overview of finds from Olomouc, Brno and Cimburk castle showed, the classic form of stangenglas was also found in Moravia (*Sedláčková 2000*, 167-170). Later, several other examples were added to these, which also included some products made domestically.

There is an almost complete form from Olomouc. In cesspit I/73 a fragment was found of a deep blue-green glass with a broken foot and a height of 17.7 cm (*fig. 13*: OlPrI-064; *fig. 14*: a). The cesspit also turned up a smaller fragment of a cylindrical body with a diameter of 4.4 cm made of colourless glass covered with light beige corrosion, and this piece can be regarded as a domestic product (*fig. 13*: OlPrI-054).[4)]

There is also a find from the period before 1540, which was discovered on Žerotín Square. The fragment, made of a deep blue-green glass, had a row of prunts beneath the upper smooth part of the body. It had a relatively wide shape, with a diameter across the body of 5 cm, and the preserved prunt is large, flat, and has a pinched tip (*fig. 13*: OlŽN2-292).

Among the pieces of stangenglas with a single row of prunts, there is a lower part of a foot with a coiled thread from cesspit 7/93 on Hrnčířská Street in Olomouc (*fig. 13*: OlHr7-333; *fig. 15: e*). This product of colourless glass, covered with corrosion, may be of domestic origin, dating from the first half of the 16th century.

Note 4:
Sedláčková 2000, 167, cat. no. 1.9.1 – indicated as a "krautstrunk" (a cabbage-stalk beaker). In an analysis of material from cesspit I/73 in Olomouc, it was found that the fragments considered to be from a tall beaker could be assembled into the cylindrical shape of a stangenglas – see OlPrI-054.

From Brno there is an example of a piece with prunts in the shape of small animal heads, found in feature 4/87 on Kozí Street, and two fragments with flat prunts, unearthed in an excavation at Kobližná Street no. 4 (*fig. 13*: Ko4-1, Kob150-1, Kob4-01; *fig 15*: a, b).[5] This last fragment came from a cesspit dated to the first half of the 15th century. A fragment of an open-work foot from a cesspit on of the 15th century (*fig. 13*: Stb5-22).

Other new finds emerge in connection with the first half of the 16th century. One is a blue glass fragment, with a pinched coiled thread on the base, found in cesspit 531/00 on Náměstí svobody no. 17 (*fig. 13*: DPL531-034; *fig 15*: d), another is the lower part of an open-work foot made of blue-green glass, taken from the cultural layer on the same lot (*fig. 13*: DPL130-1; *fig 15*: c), and another is a fragment on a foot of coiled thread, which is broken at the base, found at Dominikánská Street no. 5 (*fig. 13*: D638-01).

The youngest stangenglas from the well on Petrov no. 2 in Brno is essentially already a type of Renaissance cylindrical beaker on a blown bell-shaped foot. It was made of a medium-blue glass and had only one row of prunts on the lower part of the body (*fig. 13*: Pet1-029; *fig 14*: b). The Renaissance foot corresponds to a late dating to a period around the middle of the 16th century.

An almost complete find of green glass on a foot of coiled thread, found in the fill of a building on the site of the "Rozkvět" department store on Náměstí svobody, can only typologically be dated to the period around the middle of the 16th century (*fig. 13*: Roz-1; *fig. 14: c*).

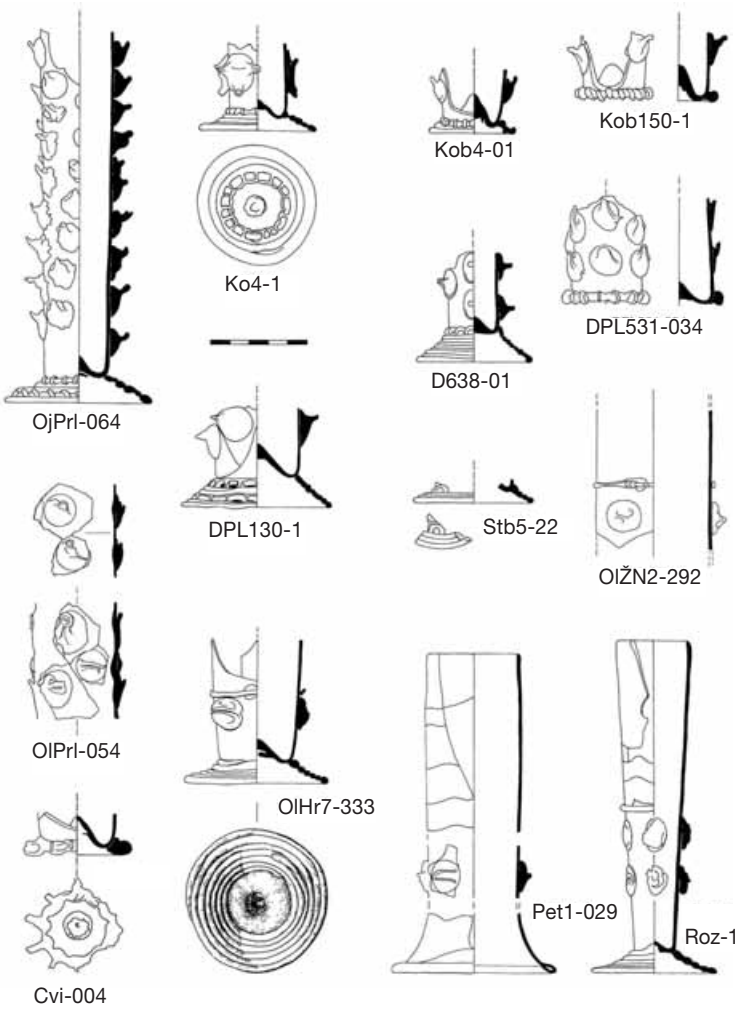


Fig. 13. Stangenglas. First half of the 15th century (Kob4-01) and the end of the 15th – middle of the 16th century.
Obr. 13. Stangenglas. 1. polovina 15. století (Kob4-01) a závěr 15. – polovina 16. století.

Fig. 14. a) OlPrI-064; b) Pet1-029; c) Roz-1.
Obr. 14. a) OlPrI-064; b) Pet1-029; c) Roz-1.

Note 5:
Sedláčková 2000, 166, cat. no. 1.3.1, 1.4.1 a 1.5.1 erroneously classified as "krautstrunk".

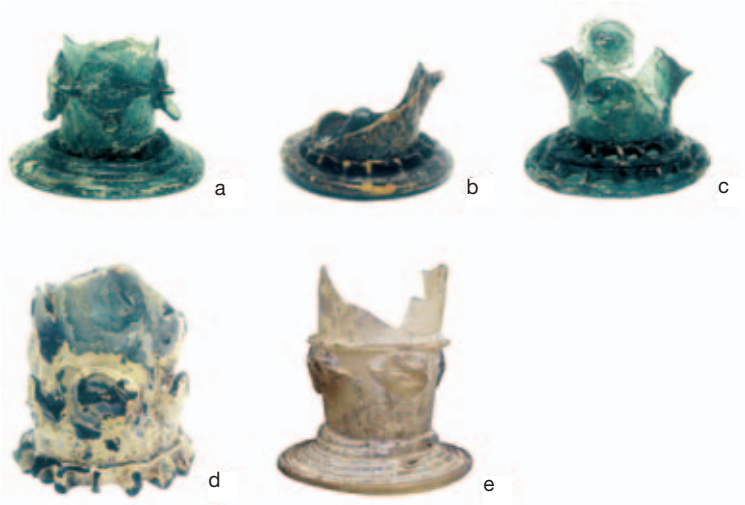


Fig. 15. a) Ko4-1; b) Kob4-01; c) DPL130-1; d) DPL531-034; e) OlHr7-333.
Obr. 15. a) Ko4-1; b) Kob4-01; c) DPL130-1; d) DPL531-034; e) OlHr7-333.

Stangenglas with one row of prunts on the lower part of the body is less common than the classic shape with a body covered with prunts in slanted and vertical rows. Published finds from the German lands are dated to the second to third quarters of the 16th century (*Rademacher 1933*, Taf. 53; *Baumgartner 1987*, cat. no. 103-106). This type is, on rare occasions, found in Germany, also from blue glass from the start of the 16th century (*Baumgartner – Krueger 1988*, cat. no. 438 and 442).

Vessels made of blue glass from the turn of the 16th century are somewhat more numerous than those from the Middle Ages, when this glass was usually used just for decoration; however they still remain rare. In Moravia, in addition to the beakers from Olomouc and Brno, I know of only one fragment of a small beaker, with ribs, found in cesspit 531/00 on Náměstí svobody in Brno (*fig. 24*: DPL531-006). I found an analogy from the first half of the 16th century for both varieties in Germany in a prunted beaker from Freising (*Baumgartner – Krueger 1988*, cat. no. 442) and in a small beaker with ribs from Lüneburg (*Steppuhn 2003*, cat. no. 2.027). These beakers are regarded as products from German glassworks or from glassworks located between the Rhein and the Maas Rivers. In this area, products made of blue glass dating to the first half of the 16th century are more numerous than they are in the Czech lands, and therefore it is likely that they were brought from there to Moravia.

In the group of Moravian finds of stangenglas, it is possible to find products of blue-green, blue, and green glass, shapes with an open-work foot, with a base wrapped around with a pinched thread, or with multiple rows of threads. The prunts tend to be very acuminate, flat with a stretched and folded back tip, and one in the shape of the small head of an animal. The oldest are from pits dating from the first and second half of the 15th century, and the youngest are dated to around the year 1550. This diversity indicates more random imports from various production areas over a longer period of time than any kind of regular supply of such goods. Stangenglas was also occasionally also made of colourless (green-tinged) glass in domestic glassworks – alongside the above-mentioned fragments from Olomouc, the lower part of the piece from Cvilín Castle is another example (*fig.13*: Cvi-004).

IV.2 Glass tableware – short shapes

- IV.2.1a Late prunted beakers (*figs. 16, 17*)

Based on finds from Brno, sometime in the early 15th century the shape of small beakers made of colourless glass (always with a light grey tinge) became fixed in the form of a slightly barrel-shaped body and a low bowl-like mouth with a thread on the neck and with a pinched thread coiled around the base. The prunts covering the body in slanted rows are larger, oval, with stretched tips 10-12 mm in diameter. They still occur occasionally in this form in the second half of the 15th century, as fragments from cesspit 7/90 on Mečová Street no. 2 indicate (*fig. 16*: Me7-01). The entire profile was preserved in cesspit 17/90 on the same lot (*fig. 16*: Me17-29; *fig. 17: a*). Beakers with the same shape, made of quality glass, dating between the 15th and the start of the 16th century can also

be found at sites in Hungary, where they are considered to be Venetian products (Budapest: *Gyürky 1986*, tab. XXV/2; *Gyürky 1991*, tab. 51/6; Felsönyék: *Gyürky 1991*, tab. 35/1; Székeszfehérvár: *Gyürky 1991*, tab. 25/10; Visegrád: *Mester 1997*, fig. 365). They have also been found in several towns in Slovenia, but there it is regarded as a product from a glassworks in Ljubljana copying Venetian models (*Lazar 2003*, 82, 84, fig. 3; *Kos – Šmit 2003*, 76).

We have many more examples of domestic late Gothic prunted beakers appearing in Brno continuously from the end of the 14th century into the first half of the 16th century. In the latest period, they can be found occasionally even in Olomouc. Usually all that had survived are individual prunts and especially bases in a range of varieties: coiled with a smooth, thick thread (e. g. *fig. 16*: Pet1-094), with a wider moulding around the base (e. g. *fig. 16*: Pet1-039), with a spiralling thread coiled around it (e. g. *fig. 16*: OlDN20-14), with a pinched thread (e. g. *fig. 16*: D617-04, NS133-12, Pet1-076), or with a wavy thread (e. g. *fig. 16*: OlPrI-062), and a large number of examples with a thread stretched into a lobe, like that found on the Olomouc-type beakers (e. g. *fig. 16*: DPL531-052). However, it may be that some bases belonged to other varieties of beaker instead.

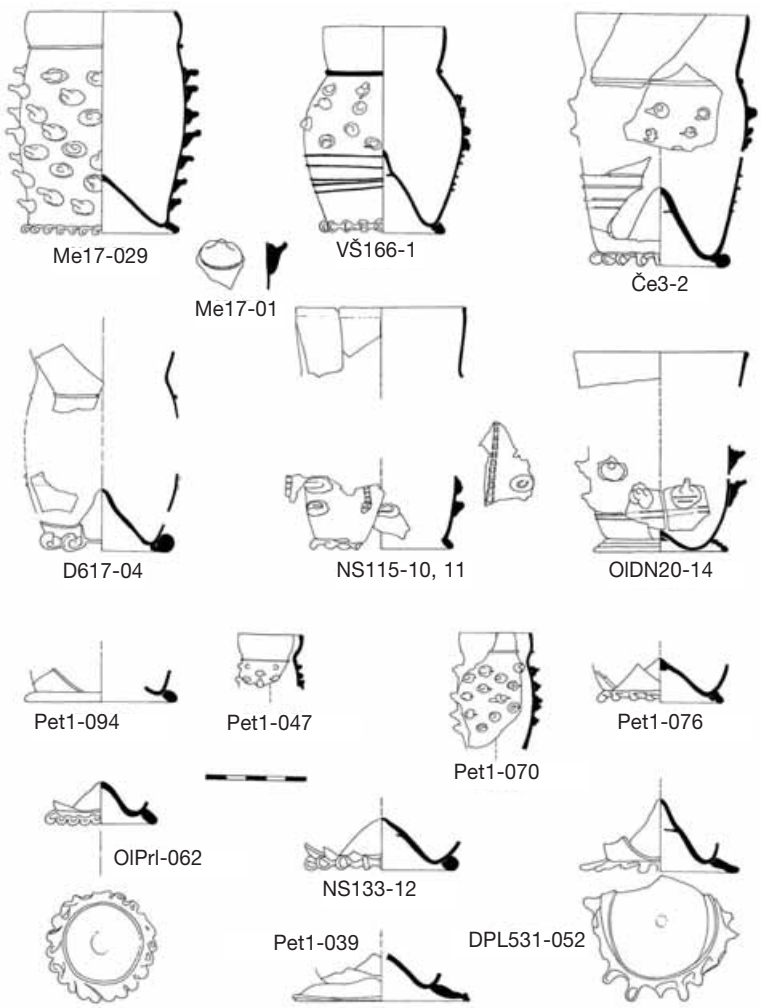


Fig. 16. Late prunted beakers. Second half of the 15th – middle of the 16th century.
Obr. 16. Pozdní číšky s nálepy. 2. polovina 15. – polovina 16. století.

Most of the finds have heavily corroded glass, and therefore, it is only possible in some cases to obtain a clear idea of their full shape. The best-preserved beaker from a layer dated to the second half of the 15th century was found on the grounds of Velký špalíček in Brno. It was made of colourless glass with nacreous corrosion, and it featured rows of blue thread coiled around the lower part of the barrel-shaped body and four rows of coil-shaped prunts around its upper part (*fig. 16*: VŠ166-1; *fig. 17: b*), and there is a beaker from Česká Street no. 5 that is completely colourless (*fig. 16*: Če3-2). One beaker on a foot of coiled thread and with large prunts, dating from the first half of the 16th century from Olomouc, also has a thread above the base (*fig. 16*: OlDN20-14).

The diversity of domestic prunted beakers from the late period is evident from two finds. In cesspit 521/04 on Náměstí svobody no. 9 in Brno, small fragments of a beaker with optical decoration of a lentil pattern were found, and on one of the fragments there is a small piece of a prunt (*fig. 26*: NS521-15). The lower part of the beaker from the cesspit on Náměstí svobody no. 1 from the first half of the 16th century is decorated with alternating lines of large prunts above one another and with vertical threads with wheel-pressed decoration (*fig. 16*: NS115-10, 11).

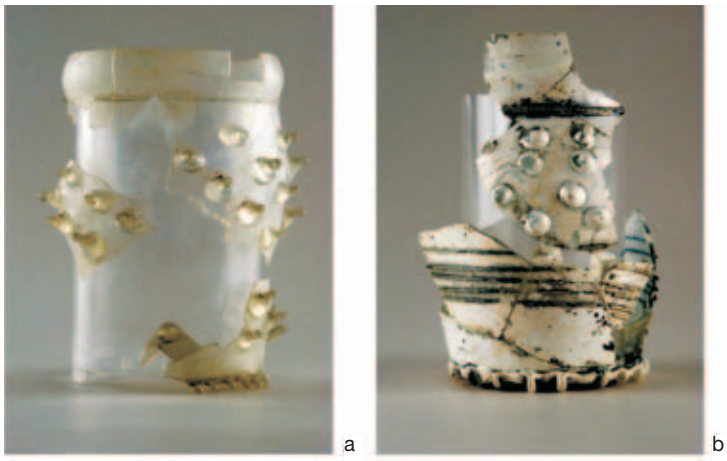


Fig. 17. a) Me17-029; b) VŠ166-1.
Obr. 17. a) Me17-029; b) VŠ166-1.

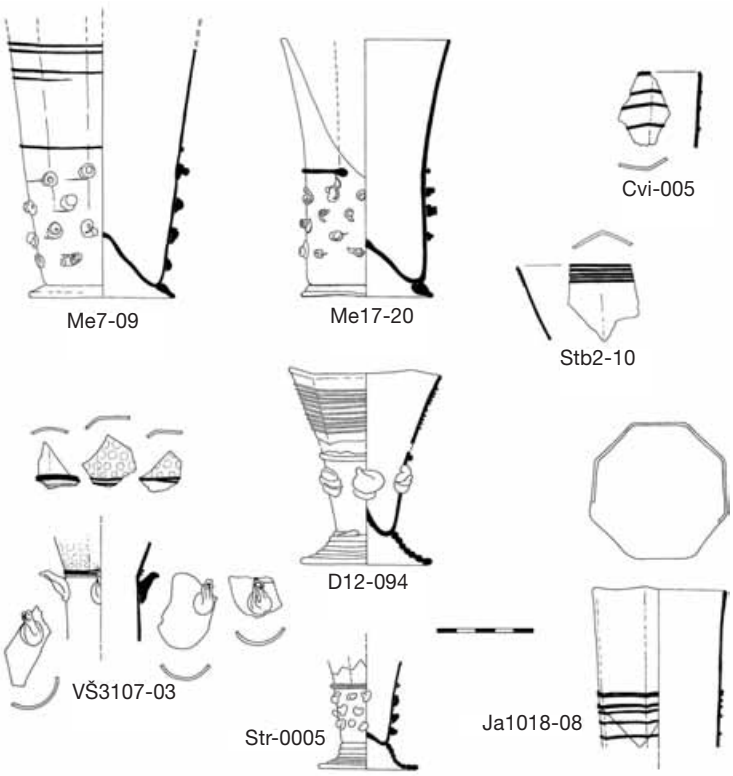


Fig. 18. Multi-sided beakers. Second half of the 15th – middle of the 16th century.
Obr. 18. Číšky víceboké. 2. polovina 15. – polovina 16. století.

Two miniature prunted beakers from layers dating from the second half of the 15th century found in a well in Petrov are considered to be children's toys (*fig. 16*: Pet1-047, 070).

- IV.2.1b Multi-sided beakers (*figs. 18, 19*)

A unique variety of beaker is a prunted beaker with a multi-sided bowl. In archaeological finds this shape appears from time to time from the end of the 13th century, and it is considered to be a product of Czech glassworks (*Pause 1993*, 10-11; *Černá 1997*, 335). These older finds have a plain cylindrical or slightly tapered shape and no prunts. We first encounter prunted beakers with multi-sided bowls in Brno at the end of the 14th century (*Merta – Peška – Sedláčková 2002*, 367, cat. no. II-19, fig. 11), and they become relatively more widespread between the middle of the 15th and middle of the 16th century. Examples have been found in Brno, at the Cvilín Castle at Krnov, and at the Anabaptist estate in Strachotín. A beaker from cesspit 7/90 at Mečová Street no. 2 dates back to the second half of the 15th century (*fig 18*: Me7-09; *fig. 19: a*). Beakers from cesspit 17/90 at Mečová Street no. 2 and from cesspit 9/90 on Dominikánské Náměstí in Brno come from the first half of the 16th century (*fig. 18*: Me17-20, D12-094; *fig. 19: b*). The first is decorated with a blue thread, and the second is made entirely of a slightly greenish glass. A fragment of the rim of a beaker made of quality glass, with a thickly coiled blue thread, is from the fill of a feature at Starobrněnská Street no. 2 (*fig. 18*: Stb2-10). At the Cvilín Castle at Krnov fragments were found of two such beakers, and a coiled blue thread has been preserved on one of them (*fig. 18*: Cvi-005).

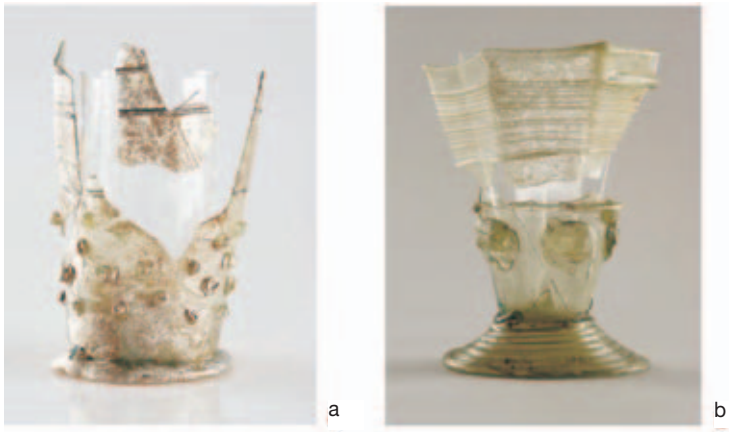


Fig. 19. a) Me7-09; b) D12-094; c) Ja1018-08.
Obr. 19. a) Me7-09; b) D12-094; c) Ja1018-08.

A high-quality product made of a very light green, pure glass was found in layer K 3107 on the grounds of Velký špalíček, dating to the first half of the 16th century. The multi-sided bowl of a small beaker with a diameter across the body of 3.7 cm features optical decorations of a lentile pattern and a blue thread coiled around the neck. The prunts are stretched to tall points and are pinched at the tips (*fig. 18*: VŠ3107-03). A small beaker with a multi-sided bowl on a foot of coiled thread made of blue-green glass was found on the grounds of the Anabaptist courtyard in Strachotín (*fig. 18*: Str-0005).

Bowls that have been blown into a six- or seven-sided shape with the aid of wooden or ceramic moulds appear more often on small beakers dating from around the year 1500 (*Henkes 1994*, cat. no. 7.4).

In Germany, tall beakers named "achtkantglas" were becoming popular at this time, and fragments of this type, with a coiled blue thread, dating from the second half of the 15th century, were found in Brno at Jakubská Street no. 4 (*fig. 18*: Ja1018-08; *fig. 19: c*).

- IV.2.1c Krautstrunk
  (Cabbage-stalk beakers – *figs. 20, 21*)

At the same time as the various types of late Gothic beakers, the first Krautstrunk beakers of blue-green glass started appearing in Moravia (*Sedláčková 2000*, 164-167). The oldest finds are two specimens dating from the destruction of the castle in Melice at Vyškov by the Hussites before 1423 (*fig. 20*: Me-1, 2). For a long time, the only Krautstrunk beaker known from Brno was from a cesspit on Zelný trh Square, which survived almost in complete form and is made of pure, blue-green glass (*fig. 20*: Zt6-1; *fig. 21*). From a well in Petrov, from a layer dating to the first half of the 15th century, the lower part of one with two prunts and made of light blue glass was found (*fig. 20*: Pet1-104). A fragment of a body with one large flat prunt of blue-green glass was found in cesspit 105/99 at Kobližná Street no. 4, which contained a mixed fill dating to the first half of the 16th and the 17th centuries (*fig. 20*: Kob105-08).

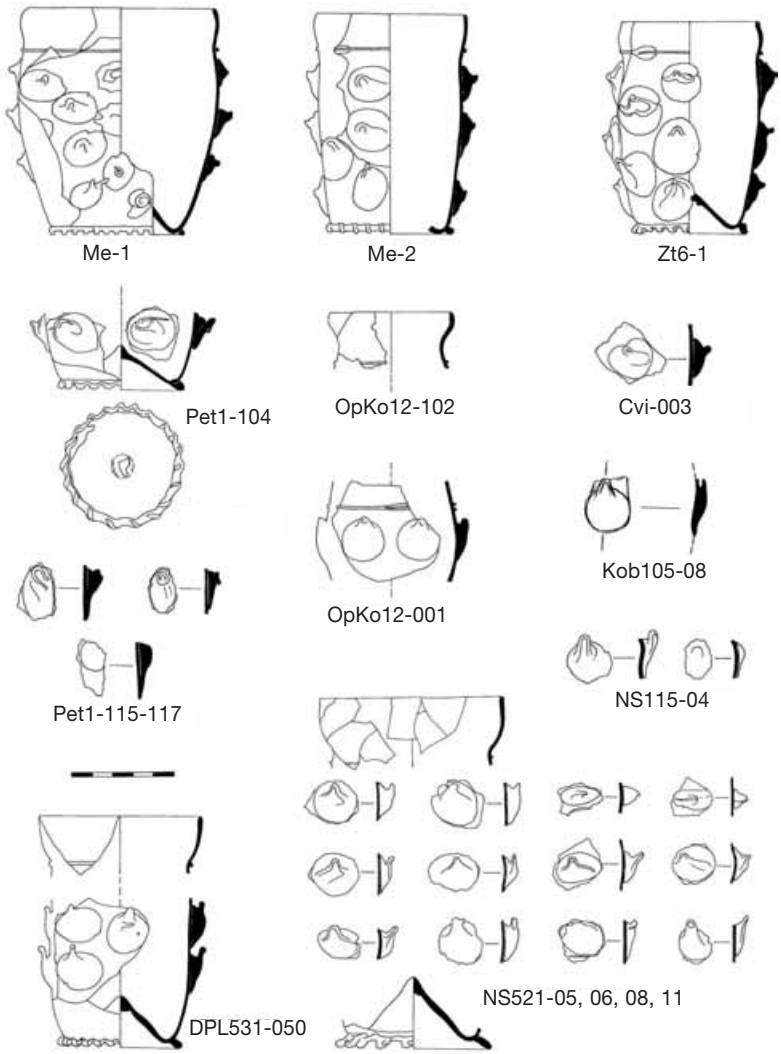


Fig. 20. Krautstrunk beakers. First half of the 15th – middle of the 16th century.
Obr. 20. Krautstrunky. 1. polovina 15. – polovina 16. století.

Also of blue-green glass is a fragment of a body with one large heart-shaped prunt, found at the Cvilín Castle at Krnov in the Bruntál region, dating from between 1474 and roughly the middle of the 16th century (*fig. 20*: Cvi-003). Other fragments are known from the castles in Lukov and Cimburk, and the find from the latter site is made of a deep green glass (*Sedláčková 2000*, 166).

Parts of two Krautstrunk beakers made of deep green glass were found in Opava in cesspit 12/63 on Kolářská Street, the content of which was dated to between the end of the 15th century and circa 1560/70 (*fig. 20*: OpKo12-001, 102).

In addition to Krautstrunk beakers made of green, blue-green, or even light blue glass, in Moravia there are also vessels with the same shape made out of poorer quality and heavily corroded glass. Their typically large prunts, with a diameter of around 20 mm, distinguish them from late beakers with prunts of smaller diameter. The oldest find of this type, dating from between 1455 and circa 1480, is from cesspit 521/04 on Náměstí svobody no. 9 in Brno. From the fragments of a thin-walled, but secondarily opacified glass with a clear to dark brown colour, it was possible to reconstruct a bowl-shaped mouth, which also belonged

Fig. 21. Zt6-1.
Obr. 21. Zt6-1.

to the fragments of a body with 12 large flat prunts, with upward-stretched tips, and with a lobed foot (*fig. 20*: NS521-05, 06, 08, 11). In the younger cesspit 531/00 on Náměstí svobody no. 17, there was a large fragment of colourless, corroded glass. A vessel with a bowl-shaped mouth, this piece has large flat prunts on a barrel-shaped body, the tips of the prunts are stretched and folded over, and a pinched thread is coiled around its base (*fig. 20*: DPL531-050).

These are all the finds of Krautstrunk beakers made of blue-green or green glass and associated shapes made of colourless glass in Moravia.[6)] They occurred in this area in the first decades of the 15th century, in the second half of the 15th century, and in the first half of the 16th century. As in the case of stangenglas, this shape was evidently made in domestic glassworks out of poorer quality glass.

Krautstrunk beakers were also found in Bohemia even before the middle of the 15th century, at which time, according to available information, they were not yet being produced even in Germany (Kutná Hora and Plzeň – *Lehečková 1975*, 460, cat. no. 81; *Hejdová – Nechvátal 1967*, 464-465, cat. no. 37 and 38). In some cases, they were found to be made of a soda-lime based composition of glass, produced in southern Europe (*Hejdová – Nechvátal 1967*, 489, analyses no's. 16 and 35). Consequently, it may be that from the end of the 14th and in the 15th century, Krautstrunk beakers were imported to Moravia and Bohemia from, for example, Venice, where fragments of them made out of a blue-green glass of local origin have been found (*Pause 1996*, 58-60).

Note 6:
In the first summary of glass from the first half of the 16th century in Moravia, a fragment was mentioned, based on literature, as coming from cesspit 3/86 on Česká Street in Brno (Himmelová 1990, 442, fig. 2: 5; Sedláčková 2000, 166, cat. no. 1.2.1). However, in a detailed analysis of the material it was possible to find other parts and to reconstruct a larger fragment of a cylindrical beaker with large snail-like prunts made of a distinctly dark brown-yellowish glass, which unquestionably belongs to a horizon from the period 1270-1350 and in the feature dating from the second half of the 15th century it represents an older piece mixed up in the fill.

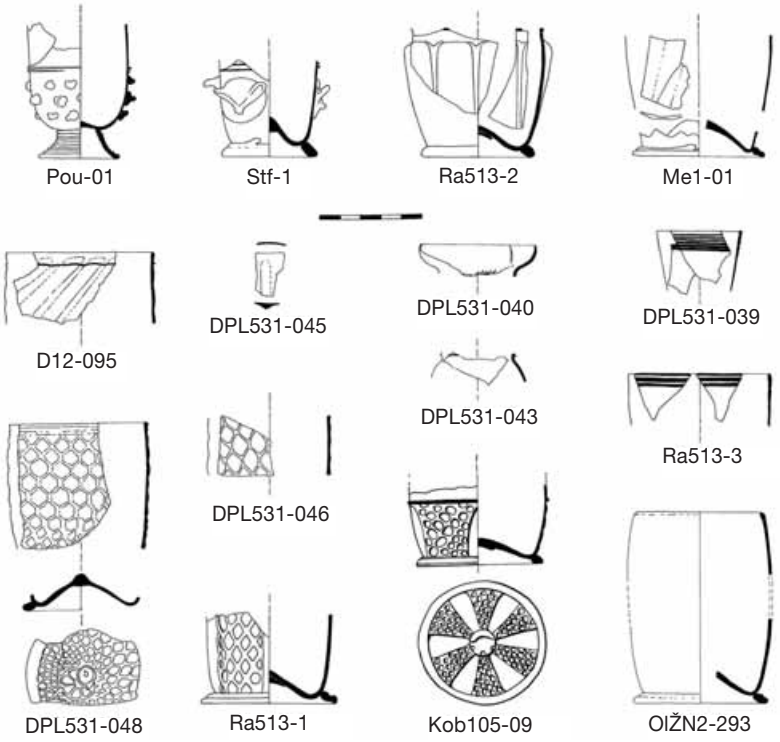


Fig. 22. Beakers made of blue-green glass. Ca 1500-1550/60.
Obr. 22. Číšky z modrozeleného skla. Ca 1500-1550/60.

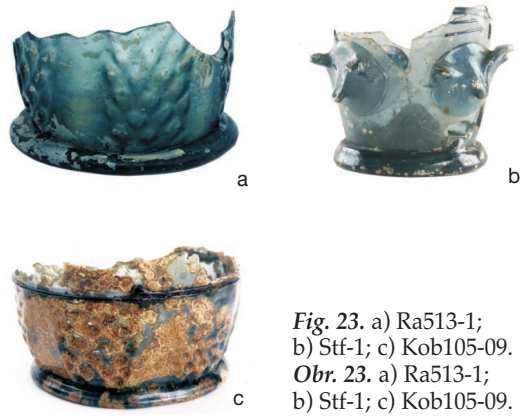


Fig. 23. a) Ra513-1; b) Stf-1; c) Kob105-09.
Obr. 23. a) Ra513-1; b) Stf-1; c) Kob105-09.

- IV.2.1d Beakers of blue-green glass (*figs. 22, 23*)

A smaller group of beakers is united by the use of quality blue-green glass, which resembles the glass of some of the stangenglas or Krautstrunk beakers from Zelný trh Square. Only some specimens are stained with corrosion. The group contains different shapes and is variously decorated. Fragments of 26 prunted beakers were found in the Anabaptist courtyards in Pouzdřany and in Strachotín. They had tall, smooth mouths, separated from the body by a fine thread, the prunts were slightly coiled, and the beakers had a bell-shaped foot with a coiled thread (*fig. 22*: Pou-01). These are small beakers with semi-oviform bodies, but there was also at least one beaker with a multi-sided body and one prunted goblet (*fig. 18*: Str-0005; *fig. 27*: Str-0011). Finds of these beakers have thus far been limited to Anabaptist sites.

One beaker with prunts in a shape of small animal heads was found in Brno (*fig. 22*: Stf-1; *fig. 23: b*), another fragment found there was from a beaker with massive ribs blown in a mould (*fig. 22*: Ra 513-2). Other fragments were from beakers with optical decoration of ribs (*fig. 22*: D12-095, DPL531-045, Me1-01), decorated all over with rose cuts (*fig. 22*: DPL531-048) or decorated with alternating ribs and rose cuts (*fig. 22*: Ra513-1; *fig. 23: a*), or with alternating smooth strips and strips with a lentile pattern only on the bottom part of the body (*fig. 22*: Kob105-09; *fig. 23: c*). On the upper part of the body, there tends to be a coiled dark-blue thread, with a thicker smooth thread around the base. Several beakers in this group have smooth tapered shapes, with several rows of blue thread on the rim (*fig. 22*: DPL531-039, Ra513-3), and there are also beakers with a bowl-shaped mouth (*fig. 22*: DPL531-040, 043). In Olomouc, a smooth barrel-shaped beaker with a thread around the base was found (*fig. 22*: OlŽN2-293).

Note 7:
I had a chance to study dozens of the same, unpublished small beakers from the cesspit in Getreidegasse no. 3 in Salzburg in April 2007. I would like to thank Dr. Wilfried K. Kovacsovics from Carolino Augusteum Museum in Salzburg for this possibility.

This is the youngest glass from the assemblage dated generally to the first half of the 16th century. A group of similar shapes made of a blue-green glass was identified in Vienna and Krems as being from the first quarter of the 16th century (*Tarcsay 2003*, 170, Abb. 7).[7)] The finds from Anabaptist courtyards may form a guideline for determining the origin. It is logical to assume that beakers were part of the supplies of the Anabaptists' original households in Germany and Switzerland, where the beakers were produced. They may therefore have first come to Moravia after 1526 with the arrival of Anabaptists.

- IV.2.2a Ribbed beakers (*figs. 24, 25*)

In the text above, we were looking mostly at glass that came to Moravia from German glassworks and the influence of such glass on domestic glassmaking. In the last decades of the 15th century, products from and the influence of Venetian glassmaking also re-surfaced in Moravia.

In archaeological finds, we can see that the intense wave of importing glass to Moravia from Italy ended at the start of the 1420s. This was no doubt a result of the outbreak of the Hussite Wars, but it was also owing to the ban on trade between Hungary and Venice, which was issued in 1417 by Emperor Sigismund (*Gyürky 1991*, 78-79). The spread of glassmaking in Hungary is associated with the need to make up for the lack of popular goods by means of domestic production, and Italian masters were involved in establishing glassworks there (*Gyürky 2003*, 48). Political, cultural, and trade ties between Hungary and Italy were not renewed until 1476 under Matthias Corvinus. The king was an admirer, patron, and collector of Renaissance art and, during his rule, Venetian glass returned to Hungary, but by then it had taken on a Renaissance style of glass. This is evident in archaeological finds (*Gyürky 1986*; *1991*; *2003*) and in written

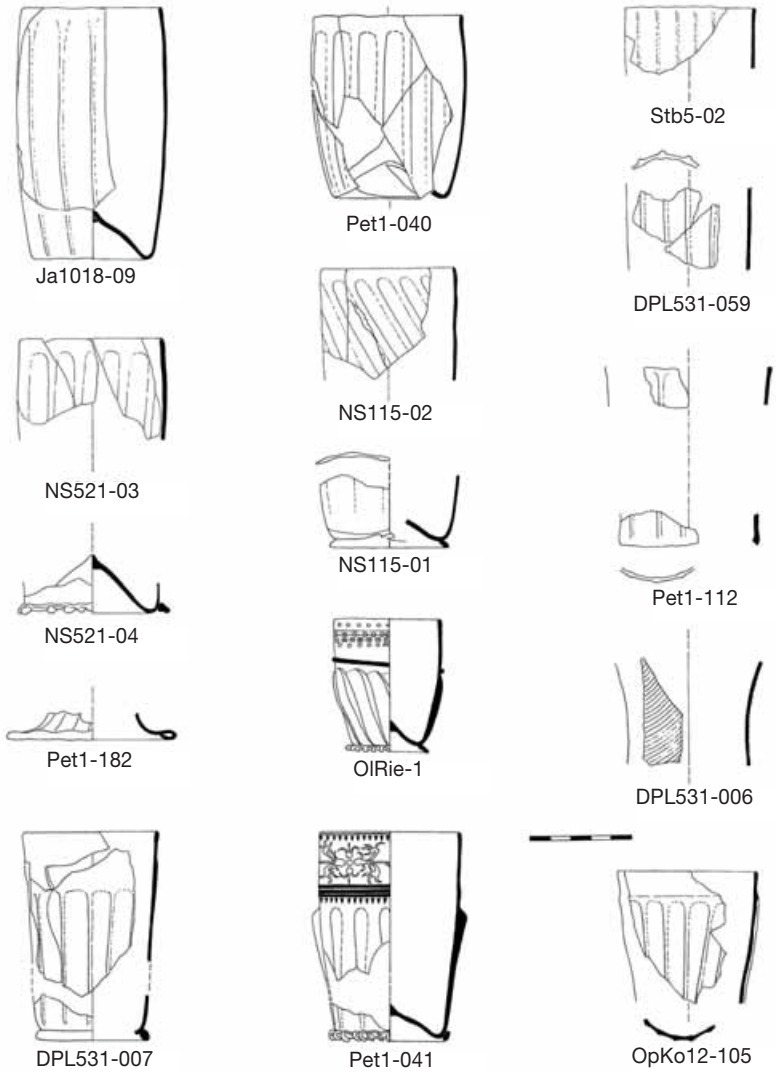


Fig. 24. Late Gothic and Renaissance ribbed beakers. Second half of the 15th – middle of the 16th century.
Obr. 24. Pozdně gotické a renesanční číšky se žebry. 2. polovina 15. – polovina 16. století.

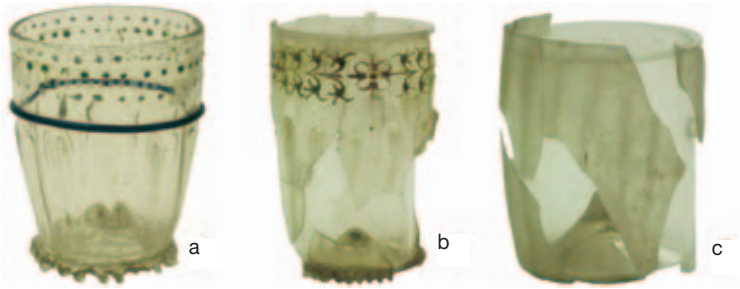


Fig. 25. a) OlRie-1; b) Pet1-041; c) Pet1-040.
Obr. 25. a) OlRie-1; b) Pet1-041; c) Pet1-040.

sources. Beakers made of crystal glass were given as gifts to the king by high-ranking church figures and imperial court dignitaries. He placed large orders for glass himself in Venice, and crystal was included in the array of royal gifts (*Balogh 1975*, 283-285).

Several pieces of the personal property of Matthias and Beatrix have survived to date and they provide an idea of the kind of glass found in the highest social echelons. The pieces are large, between 34 and 42 cm in height, luxuriously designed, and usually fitted with a lid. Enamel, gilded, and applied decorations made of multi-coloured glass adorn their tapered bowl. The foot is tall, bell-shaped, and, like the bowl, is ribbed. The pieces were made in the years 1480-1490. A beaker bearing the symbol of the Czech lion and the Hungarian coat of arms is decorated in gold and in red and white enamel (*Strasser 1999*, 6, Abb. 4 – destroyed during the war in Wrócław). A goblet with a smooth funnel-shaped bowl has a large filigree node *(vetro a fili)*. According to the inscription on the metal, gilded bell-shaped foot, it belonged to Matthias Corvinus and later to Ludvík Jagello (*Strasser 1999*, 13, Abb. 5). During an archaeological excavation in Buda, fragments of a goblet were found bearing the heraldic arms of Queen Beatrix (*Balogh 1975*, 285).

The connection between another two exquisite glass beakers and Matthias Corvinus as the donor stems from historical sources and events, according to which Matthias was generous even towards his defeated adversaries. He used to give them beakers as gifts to secure their allegiance. In 1485, he was so impressed with the way Pitten fortress in Lower Austria was defended that he gave the commander there, Wolf Teufel, a silver goblet as a gift. It has also been verified that he gave the New Town in Vienna a gift of a tall silver goblet in 1487, when the town surrendered to the king (*Strasser 1999*, 12).

There is also knowledge of a glass beaker on a blown bell-shaped foot, described as the "beaker of Petronell", which features *nipt-diamond-weies* decoration in relief and is richly gilded in colourful enamels. This was probably a gift made when a treaty was signed in 1487 between Matthias and the representatives of estates in Lower Austria (*Strasser 1999*). The beaker of the "Lords of Puchheim", which survived with its lid, is decorated with prunts in blue and purple glass and in gold and coloured enamels. The fate of the beaker can again be traced to Matthias' military sieges in Austria, when in 1482 Hartneid I von Puchheim surrendered "in peace his estates in Vienna's New Town and was presented with the beaker" (*Strasser - Baumgärtner 2002*, cat. no. 2). Both the "Petronell beaker" and the beaker of the "Lords of Puchheim" were subsequently adorned in the 17th century with diamond-engraved inscriptions that had no relation to the original events.

The popularity of Venetian glass in Hungary found an immediate echo in Moravia. This brings us to the beaker of the "Lords of Deblín" which is, beyond doubt, another gift from Matthias Corvinus. It takes its name from an inscription on the foot and it is located today in the British Museum in London (*Tait 1979*, cat. no. 23, plate 2). The beaker is a unique piece, one of only four such pieces in the world (*Strasser - Baumgärtner 2002*, 21-27). It is 42.2 cm high and has a tapered bowl with a lobed moulding above the foot. The *nipt-diamond-weies* decoration in relief on the body is accompanied by three rows of large, flat

prunts with stretched tips. The upper and lower rows are made of deep blue glass and the middle row is purple. The rim is purfled in enamel and gold. The ribbed lid is also decorated with enamel and gold. On the lower side of the foot, there is a diamond-engraved inscription that reads:

KWALTE HOSPODINA A PITE / *PRAISE THE LORD AND DRINK*
Z CZERSTWIHO WINA ZA ZDRAWI / *OF THIS NEW WINE*
TO THE HEALTH
PANUW Z DEBLINA / *OF THE LORDS OF DEBLIN*

A toast and date are inscribed on the underside of the base:

BIBITE EX HOC OMNES Anno DCCCCXV

The year 1415 contradicts both the beaker's ownership by the lords of Deblín and the beaker's dating, as it must have been made in the last quarter of the 15th century, when the estate of Deblín belonged to the City of Brno. The Deblíns were the owners of the estate until 1415 and it was not until 1573 that the new owner, the Brno townsman and duties collector, Matouš Šram, obtained the heraldic title "of Deblín". The fate of the Deblín beaker can hypothetically be linked to the descendent of the new lord of Deblín, Maximilián František, who lived during the second half of the 17th century. He was a great history lover and collector of old historical relics. Perhaps for this reason, this Maximilián František acquired the beaker and in an effort to increase the historical prestige of the relatively recent establishment of his family lineage he had an inscription and date added to it, revealing his own inadequate knowledge of history. There are reports even in the middle of the 18th century about an inherited collection at Znojmo castle, and in 1784 the family of the lords of Deblín died out (*Ottův slovník 1893*, 109-110).[8)]

On rare occasions, only simpler variants of these opulent beakers ended up in the cesspits. It may be that some were even made in glassworks in Slovakia in the second half of the 15th century, under the influence of Venetian glass. Pieces that may be products from Slovakia are a whole beaker with ribbing set on a tall bell-shaped foot, made from a single piece of slightly green-yellow glass from Trnava (*Meszárosová 1983*, 120-122, fig. 2, 8) and a fragment of a foot from the castle in Bratislava (*Maruniaková 1989*, 319, fig. 11: c). Glassworks in Hungary were also making these shapes of beaker at beginning in the first half of the 15th century (*Gyürky 2003*, Abb. 3, 4). The only example of this type of beaker in Brno is a fragment of a foot found in a well in Petrov (*fig. 24*: Pet1-182). According to the poor quality greenish glass, this is evidently a product from a glassworks in Lower or Upper Hungary.

A beaker set on a blown bell-shaped foot with centaurs, which is today housed in the museum in Prostějov, is a less luxurious product, decorated with coloured enamels (*fig. 33*: Pro-2; *Hetteš 1973*, cat. no. 7). Although the year 1518 is inscribed on the bottom of the funnel-shaped bowl, this again may have been added later. It is difficult to judge how it was acquired. Nevertheless, it would not be implausible to associate it with the Pernštejns, lovers of art and propagators of the Renaissance in Moravia.

Unlike Hungary and Slovakia, there are not many archaeological finds of glass of Venetian origin in Moravia. Alongside a complete Bardejov beaker with crests and with a foot made of deep blue glass, there is a fragment of the same foot from the monastery in Košice – Krásná in Slovakia (*Füryová – Janovíčková 1988*, fig. 1, 2: 4). Thus far unpublished is a collection of Venetian glass,

Note 8:
The beaker of the "Lords of Deblín" is so significant an example of Renaissance glass that it warrants a study of its own. It became part of the collection in the British Museum in London in 1892, when it was donated by Baron Rothschild, one of the biggest collectors in the 19th century. I was not able to find out whether any other information relating to this gift is contained in the museum's old inventories, such as how it was acquired or perhaps its price. The collectors of the 19th century tended to acquire pieces by buying them from dealers, and it is likely that the Deblín beaker was acquired in the same way. However, at that time, it may no longer have been in Moravia. The dating of the subsequent inscription is important and could be determined more accurately by means of a palaeographic analysis. However, I believe that in archive sources it would be possible to find the details of to whom the beaker was given and when – the time corresponds to a gift to the City of Brno for outstanding services.

Note 9:
I would like to thank Dr. Marta Janovíčková for allowing me access to study the material deposited in the City Museum of Bratislava. I had a possibility to study similar pieces later in Salzburg.

including beakers with a foot made of deep blue glass found in Bratislava at Sedlárska Street no. 4.[9)] In Moravia, there are first of all the two beakers with ribbing and with enamel on a smooth mouth from Olomouc and Brno and a fragment of a lid with ribs of pure green glass (*fig. 24*: OlRie-1; *fig. 25: a*; *fig. 24*: Pet1-041; *fig. 25: b*; Pet1-026). There is no doubt that these products originated in Venice – a number of similar examples have been preserved in collections in European museums (e. g. *Strasser 1999*, Abb. 3), and there are also examples in the mentioned collection in Bratislava. The Bratislava beakers are made of an excellent quality glass, which I visually judged to be "kristallo". An analysis of the Olomouc beakers revealed a common soda-lime glass with a high content of potassium oxide (*Sedláčková ed. 1998*, 106, analysis no. 1) and, based on a visual assessment the Brno beaker, can also be judged to be from the same glass.

Also of Venetian origin are some simple beakers with ribs, pre-blown into a mould. The beaker from Brno – Jakubská Street no. 4, from a well in Petrov, and a fragment from Starobrněnská Street no. 5 (*fig. 24*: Ja1018-09, Pet1-040; *fig. 25: c*; *fig. 24*: Stb5-02) are made of a slightly greyish glass, and in shape allude to the simple tapered beakers optically decorated with ribbing, produced in the 14th century. The results of the analyses of the same beakers from Visegrád show they are made of soda-lime glass (*Mester 1997*, fig. 78, 304, 366, analysis 138/377).

Simple beakers and beakers decorated with enamel were replicated in domestic production using a poor quality glass. An almost complete beaker was found in Brno, with smooth thread coiled around the base and with a smooth mouth on top of a body with ribs (*fig. 24*: DPL531-007). Beakers from Opava belong to this same type, as perhaps also some fragments from Brno (*fig. 24*: OpKo12-105, DPL531-059, Pet1-112). The fragments of simple ribbed beakers from corroded glass found in cesspits on Náměstí svobody no. 1 and no. 9 belong to the simple variety, even though the older one evidently had a base with a pinched coiled thread (*fig. 24*: NS115-01, 02, NS521-03, 04).

- IV2.2b Beakers with flat optical decoration (*fig. 26*)

Simple tapered beakers with optical decoration of lentile pattern stopped being imported to Brno after the middle of the 15th century. They only appear in cesspit 17/90 on Mečová Street no. 2 and in cesspit 614/00 on Dominikánská Street no. 5 (*fig. 26*: Me17-28, D614-14). The similarity of the pure, slightly blue-tinged glass material and the subtle design indicate they were imported from the same glassworks. After 1500, they are only known from finds from cesspit I/73 in Olomouc and cesspit 531/00 in Brno (*fig. 26*: OlPrI-068, DPL531-056). There are no other simple beakers like these that draw on the tradition of optically decorated mediaeval beakers in Moravia. The quality glass material of the youngest specimens enables the assumption that they were imported from Italy.

Domestic glassworks also began producing beakers covered with optical decorations. The oldest finds date from around 1480. A beaker with lentiles and prunts from a cesspit in Brno has already been mentioned (*fig. 26*: NS521-15). Fragments of beakers with rose cuts were also found in the same feature (*fig. 26*: NS521-14).

Other domestic beakers covered with decorations are known from the first half of the 16th century. The bases tended to have one or more threads coiled around them. A fragment of the lower part was found in cesspit 12/96

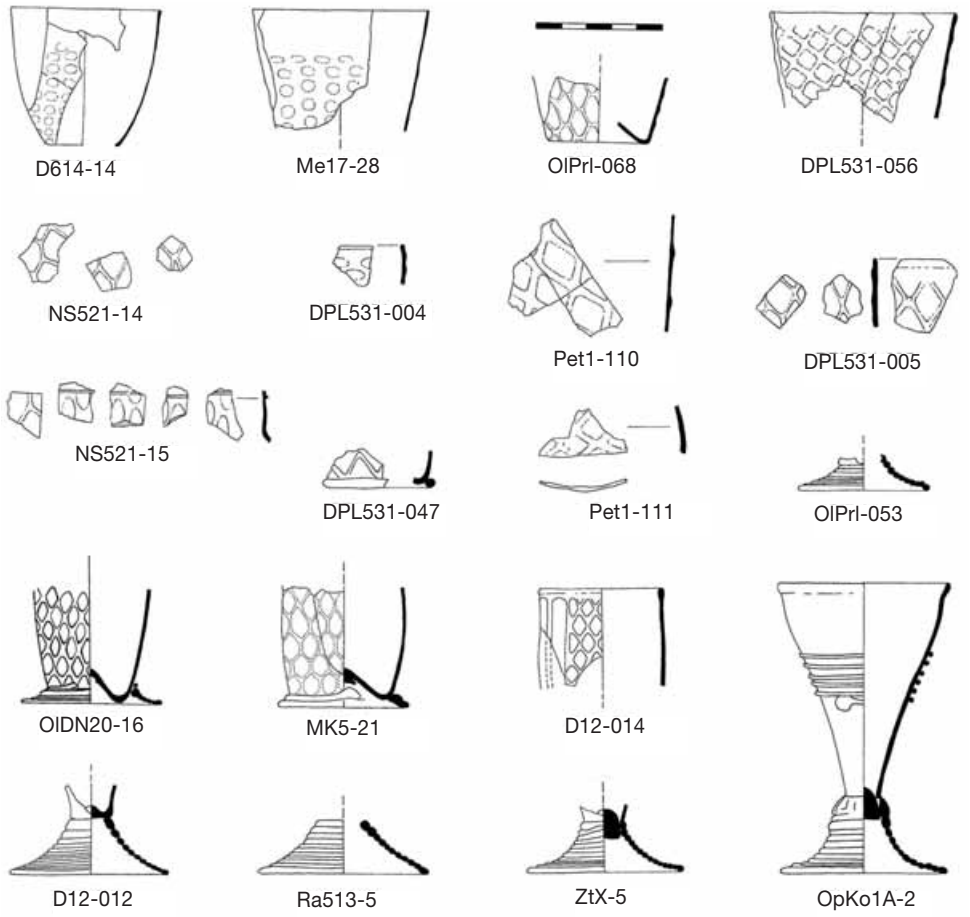


Fig. 26. Late Gothic and Renaissance beakers covered with optical decorations and funnel-shaped beakers.
Obr. 26. Pozdně gotické a renesanční číšky s plošným optickým dekorem a trychtýřovité číšky.

in Olomouc, and fragments of a base and body are from cesspit 531/00 in Brno and from Petrov (*fig. 26*: OlDN20-16, DPL531-004, 005, 047, Pet1-110, 111). The youngest beaker from waste cesspit 5/89 at the Minorite monastery and another fragment from Brno (*fig. 26*: MK5-21, D12-014) are similar in shape to the cylindrical beakers from the period of Rudolf II, which were widely found in Moravia and Bohemia (e. g. *Sedláčková ed. 1998*, cat. no. 02.3-10, 11; *Sedláčková 1997*, cat. no. 5-9).

- IV.2.3 Funnel-shaped beakers *(fig. 26)*

Another Renaissance shape is the funnel-shaped beaker on a bell-shaped foot of coiled thread ("Spitzglas") that survived in complete form in Opava on Kolářská Street (*fig. 26*: OlKo1A-2). The only other examples known are foot fragments, sometimes with a small part of the body (*fig. 26*: OlPrI-053, OlŽN2-029, D12-012, Ra513-5, MK5-17, ZtX-5). They are all made of a greenish glass that contains bubbles and small grains of sand. Worth noting is the method used to create the base of a beaker from Opava and a disturbed cesspit in Brno at Zelný trh Square no. 9: a massive semi-spherical stopper was lodged into the lower part of the body. This is not the only case – the above-mentioned beaker with garlands from Opava and a magnificent lamp from Brno also have an inserted base (see below). In my opinion, this technical detail, elsewhere unknown, is evidence of the objects having originated in the same glassworks. We can also find a similar shape in a collection from Strachotín. It may be that even this belongs to the group of older glass (*Sedláčková 2001a*, fig. 5: 98, 126). The shape continues to remain in the repertoire of glass from the Rudolphine horizon (e. g. *Sedláčková ed. 1998*, cat. no. 02.3-8).

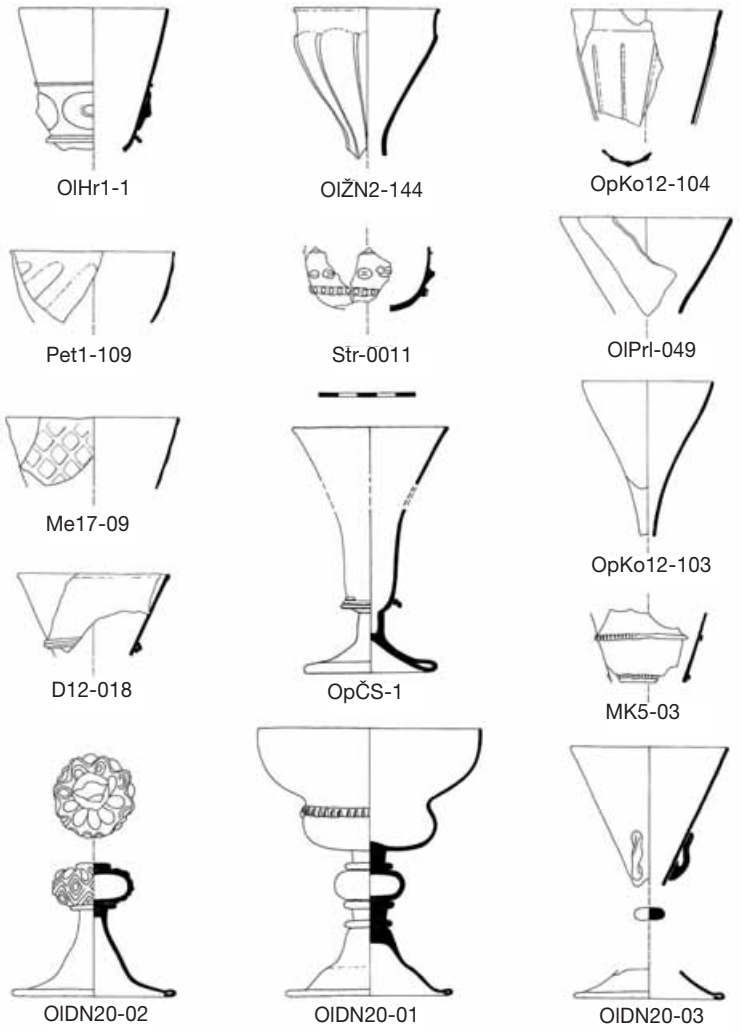


Fig. 27. Late Gothic and Renaissance goblets. End of the 15th – middle of the 16th century.
Obr. 27. Pozdně gotické a renesanční poháry. Závěr 15. – polovina 16. století.

Fig. 28. OlDN20-01.
Obr. 28. OlDN20-01.

IV.3 Goblets (*figs. 27-31*)

In medieval Europe, the goblet belonged to the wine-related sphere of French glass, and in Central Europe it appears only rarely. This shape, on a tall, slender base, began to be produced in the German lands only at the end of the 15th century, undoubtedly under the influence of Venetian products. German terminology distinguishes between the shapes that make up some of the varieties of the beakers appearing at that time with an appended tall stem ("Gläser/Becher mit Stiel", *Baumgartner – Krueger 1988*, 408-416) and the goblets that were made from three parts and were already in a Renaissance form, made according to Venetian models ("Kelchglas", *Drahotová – Žegklitzová-Veselá 2003*). The Czech language only has one term for the two – "goblet".

In Moravia, only fragments have survived of the oldest of the many goblets representing "beakers on a foot". A bowl made of green glass from Olomouc, with one row of large prunts and with a coiled thread around the base, is dated to the end of the 15th century (*fig. 27*: OlHr1-1; *fig. 30*). An identical goblet comes from Regensburg (*Trapp – Boos – Germann-Bauer 1995*, cat. no. 174). Another goblet from Olomouc, somewhat younger, has a bowl with ribbing blown in a mould (*fig. 27*: OlŽN2-144), which is also in the shape of a late beaker. Evidence of its German origin is the potash-lime composition of the glass, which is visually very pure and yellowish (*Sedláčková ed. 1998*, cat. no. 19.1-1, 111, analysis no. 19). There is a fragment of a ribbed bowl of yellowish glass also from feature 12/63 in Opava (*fig. 27*: OpKo12-104). A foot of a goblet of blue-green glass comes from the castle in Cvilín Castle (Cvi-058). The bowl of a prunted goblet from Strachotín, with a thread around the base, is made of blue-green glass (*fig. 27*: Str-0011).

The first real goblets north of the Alps were made at a Tyrolean glassworks in Hall, established in 1534. It produced a Venetian-style glass with soda imported from Spain, and employed Italian glassmakers (*Egg 1962*). Three unusual goblets came from Hall to Olomouc (*fig. 27*: OlDN20-01-03; *fig. 28*; *Sedláčková ed. 1998*, cat. no. 04.1-1, 106, analysis no. 2). Dating and origin can draw on an analogical example of a complete goblet, with a bowl-shaped bowl. This is a "Luther's goblet", dating from between the 1530s and 1540s (*fig. 29*), one of the best-studied pieces of glass in Germany (*Reformation 1983*, cat. no. 607).

In other cesspits from the second quarter of the 16th century, fragments of Renaissance-style goblets also appear. Based on the greenish or greyish glass material, they could have been made in Moravian glassworks, but more likely come from Lower Austrian glassworks. Several of them have a smooth funnel-shaped bowl, sometimes coiled with a thread bearing wheel-pressed decoration (*fig. 27*: OlPrI-049, D12-018, MK5-03), or a bowl with optical decorations (*fig. 27*: Me17-09, Pet1-109). There are even fragments of goblets with a smooth semi-ovoid bowl (OlŽN2-006, 009). The bell-shaped foot from this period is massive,

Fig. 29. Luther's goblet. German national museum in Nuremberg.[10)]
Obr. 29. Lutherův pohár. Německé národní muzeum v Norimberku.

Note 10:
I would like to thank Dr. Silvia Glaser from Germanisches National Museum Nuremberg for making this picture available and for arranging for possibility to publish it in this text.

Fig. 30. OlHr1-1.
Obr. 30. OlHr1-1.

with the impression of pincers beneath a small, full node (*fig. 31*: Me1-06, Me4-006, VŠ3107-04), while others have a simple bell-shaped foot without a node (*fig. 31*: D12-011).

I must also mention a goblet from Opava that was found in a cesspit dating to the turn of the 17th century (*fig. 27*: OpČS-01). The goblet has a bell-shaped bowl shaped from a single piece, like the above-mentioned goblet from Trnava, and one from Biel in Switzerland, both of which date from before the middle of the 16th century (*Glatz 1991*, cat. no. 269). It is therefore likely that the Opava goblet comes from the same period and that it is an older material added to the feature.

The range of shapes and decorations on goblets grew rapidly. Around the middle of the 16th century, goblets were appearing with a funnel-shaped, semi-oviform, and spindle-shaped bowl, either smooth or with optical decoration of rib and lentile patterns (e. g. *fig. 27*: OpKo12-103; *fig. 31*: D12-010, Me1-05, 07, Pet1-011), no different from the shapes from the end of the 16th century. On cheaper products made of a slightly greenish glass, there are often rod-like stems and the foot is coiled with a thread (*fig. 31*: D12-006), and large blown nodes also start to appear (*fig. 31*: Me4-005).

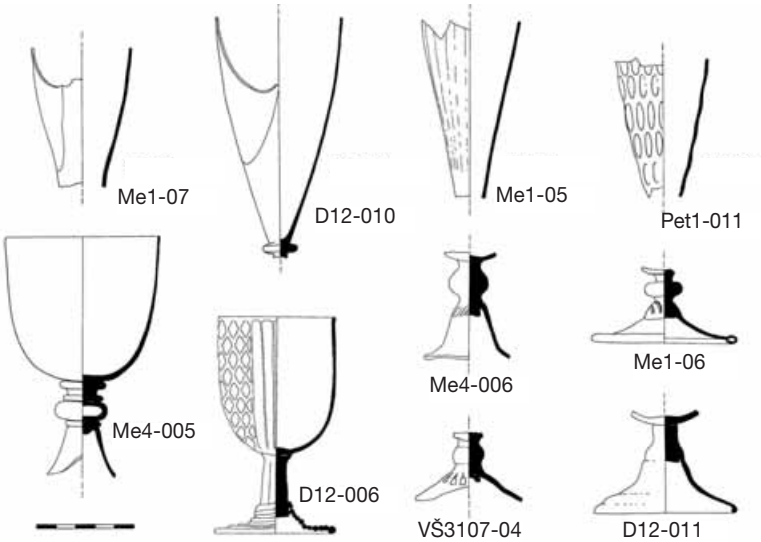


Fig. 31. Renaissance goblets. Circa 1550.
Obr. 31. Renesanční poháry. Kolem 1550.

IV.4 Beakers on a hollow bell-shaped foot (*figs. 32, 33*)

The model for a popular Renaissance shape – beakers on a blown bell-shaped foot – was Venetian beakers, made from the start of the 16th century. They were small shapes, usually with a funnel-shaped bowl with enameled decoration. An example is a beaker with centaurs from Prostějov (*fig. 33*: Pro-2).

We find fragments of undecorated specimens in archaeological material around the middle of the 16th century. They are made of a slightly greenish or greyish glass, and are often funnel-shaped (*fig. 32*: Me1-03, Pet1-008, 009, OpKo12-004). An example of enamel decoration from this time is the fragments of a large beaker from a well in Petrov (*fig. 32*: Pet1-006). After the middle

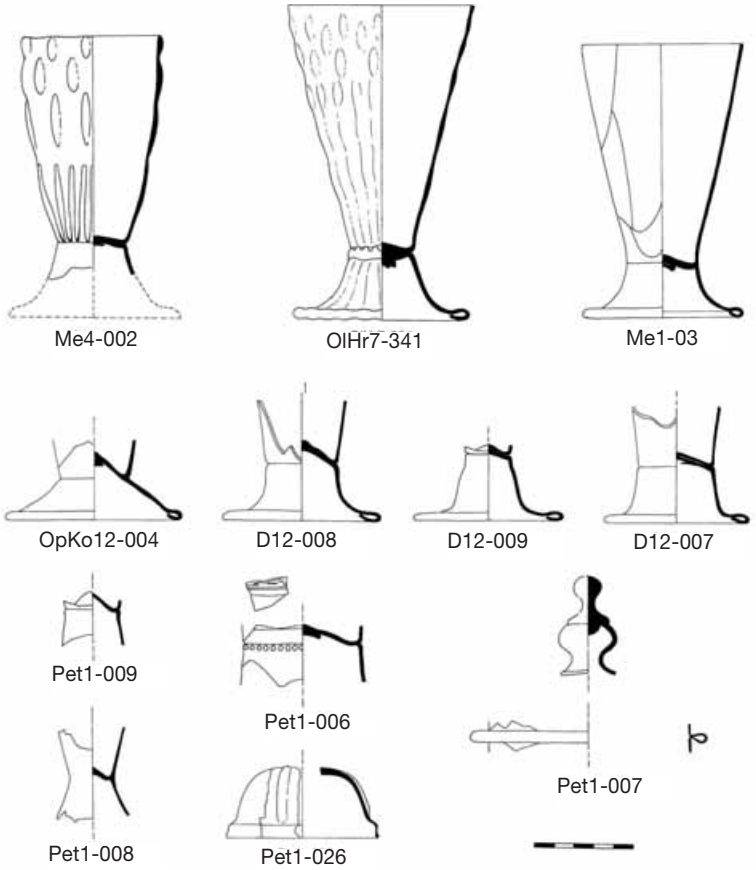


Fig. 33. Pro-2. Prostějov Museum.
Obr. 33. Pro-2. Muzeum Prostějovska.

Fig. 32. Beakers on a blown bell-shaped foot. First half of the 16th century – circa 1550/60.
Obr. 32. Číše na duté zvonovité patce. 1. polovina 16. století – ca 1550/60.

of the 16th century, beakers on a blown bell-shaped foot are very common in archaeological material (e. g. *fig. 32*: D12-007-009).

In Olomouc, larger funnel-shaped beakers on a blown bell-shaped foot, made of greyish glass material, and often with optical decoration of lentile pattern, appeared before the middle of the 16th century.

It is likely that, like the goblets, they come from Hall, or from some other Viennese glassworks, founded in the years 1530 and 1552 (*Tarcsay 1999*, 8-9). Fragments of roughly 13 pieces were found in cesspit 7/93 on Hrnčířská Street (*fig. 32*: OlHr7-341), which was filled from the period before the middle of the 16th to the start of the 17th century. Occasionally, this shape has been found in Brno, in layers from the second half of the 16th century (*fig. 32*: Me4-002).

A novelty in Renaissance glassmaking is two lids made of greyish and bright green glass (*fig. 32*: Pet1-007, 026). They only start appearing in larger numbers in the Rudolphine horizon.

IV.5 Bottle tableware, kuttrolf, and "pilgrim bottles" (*figs. 34-38*)

An integral part of dinnerware in mediaeval Brno was bottle tableware. From the middle of the 13th to the first half of the 15th century, several types are found here in large numbers. Until the middle of the 14th century, the most common was a bottle with an inside ring and with the lower part of the body in a cylindrical shape, which occasionally appeared also in Olomouc. In Opava and at the Cvilín Castle, a variety of this type with a barrel-shaped lower body only begins to appear between the second half of the 15th and the first half of the 16th century (*fig. 34*: Cvi-002). This variety is found often until the 16th century in the areas of Slovakia, Hungary, and the former Yugoslavia; its occurrence at the Cvilín Castle can be linked to the sojourn of the armies

of Matthias Corvinus there in 1474 (*Sedláčková 2004*, 243; *Sedláčková 2004a*, 369-370).

Other surviving types of tableware bottles up to the second half of the 15th century include a bottle with ribbing and with a funnel-shaped mouth, thickly coiled with a blue thread. These bottles were made of quality colourless glass with a greyish tinge, and were evidently produced in Italy. They appear in the same shape in a large part of Europe – from Slovenia through to Hungary, Lower Austria, southern Moravia, and southwest Germany. The oldest pieces are dated to the end of the 13th century, the youngest to the start of the 16th century. Eight bottles of this type were found in Brno. The oldest was in a layer containing coins from the period after the middle of the 14th century (*Himmelová 1990*, 440, fig. 2: 2). One of the youngest pieces from 7/90 on Mečová Street no. 2 is dated, based on the coins, to the period before circa 1460 (*fig. 34*: Me7-03; *fig. 35*). A fragment from cesspit 17/90 on the same lot dates to the second half of the 15th century (*fig. 34*: Me17-42) and another fragment from cesspit 638/00 at Dominikánská Street no. 5 theoretically dates to the first half of the 16th century (*fig. 34*: D638-24).

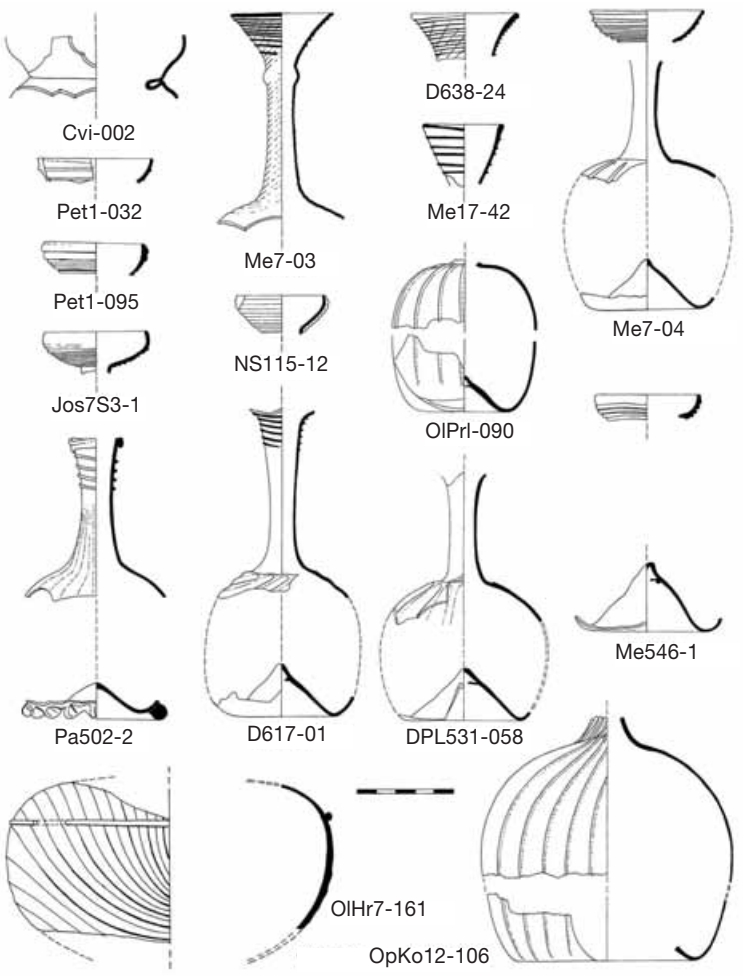


Fig. 34. Bottle tableware. Last quarter of the 15th century – circa 1550/60.
Obr. 34. Stolní lahve. Poslední čtvrtina 15. století – ca 1550/60.

From the first half of the 15th century, the preceding type of bottles is gradually replaced with bottles with a bowl-shaped mouth, also coiled with a blue thread. The body of the bottle is optically decorated with ribs, but the neck is smooth. They are made of poor quality glass, often thoroughly corroded. The oldest find from the first half of the 15th century is from a well on Dominikánské Náměstí (*Štourač 2005*). Fragments of 11 specimens in Brno date from the second half of the 15th up to the middle of the 16th century.

From cesspit 7/90 at Mečová Street no. 2, where the youngest bottle with a funnel-shaped mouth was found, a fragment of a bottle with a bowl-shaped mouth was also found (*fig. 34*: Me7-04). The same dating applies to finds from a well in Petrov at Josefská Street no. 7 and Mečová Street no. 4 (*fig. 34*: Pet1-095, Me546-01, Jos7S3-01). The others were added to the pits in the first half of the 16th century (*fig. 34*: D617-01, NS115-12, DPL531-058, Pa502-3, Pet1-032).

This bottle is occasionally found in the first half of the 16th century in Olomouc and Opava (*fig. 34*: OlPrI-090, OlHr7-161, OpKo12-106). Based on the glass material and the corrosion, the youngest piece was identified in the Anabaptist courtyard in Strachotín (*Sedláčková 2001a*, fig. 7: 1156).

Late dating of Moravian finds corresponds to finds of bottles with a bowl-shaped mouth from Vienna, where they appear in collections terminated before 1529 (*Tarcsay 1999*, 40). Finds of this type of bottle in Hungary are identified as coming from domestic glassworks (*Gyürky 2003*, 48). It can be assumed that they also came to Moravia from there.

Fig. 35. Me7-03.
Obr. 35. Me7-03.

Bottles with a bowl-shaped mouth are regarded as precursors to German kuttrolfs made of green or blue-green glass and having one or more necks (*Prohaska-Gross – Soffner 1992*, 309). From sometime at the end of the 15th century,

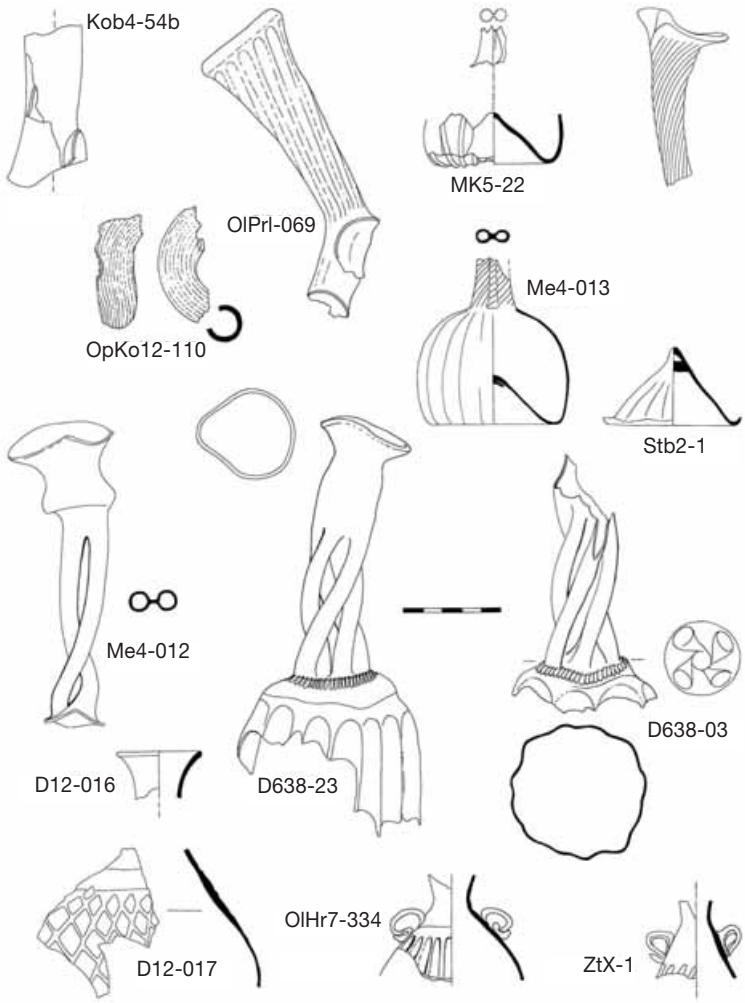


Fig. 36. Kuttrolfs and "pilgrim bottles". First half of the 15th century (Kob4-54b) and end of the 15th century – circa 1550/60.
Obr. 36. Kutrolfy a poutnické lahve. 1. polovina 15. století (Kob4-54b) a závěr 15. století – ca 1550/60.

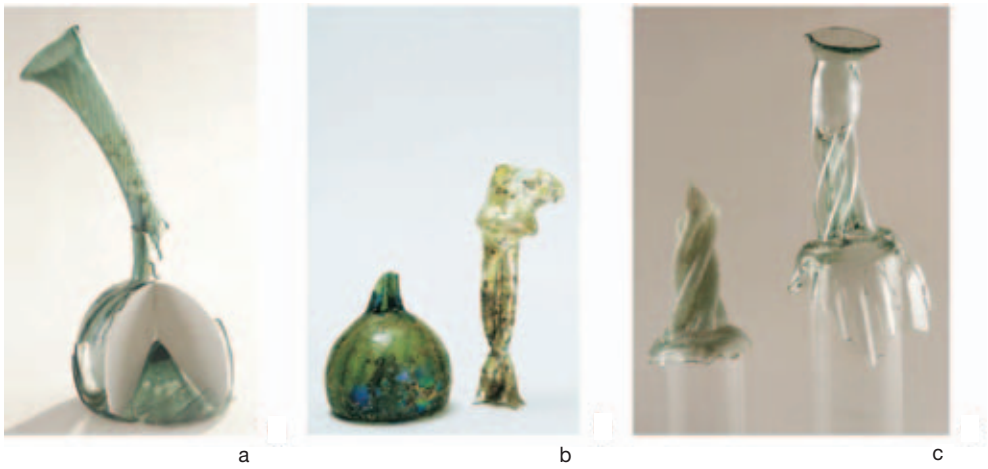
but certainly the first half of the next century, several kuttrolfs from Germany are found in Brno. This shape of bottle, with one neck and made of green glass, were found at Starobrněnská Street no. 2 (*fig. 36*: Stb2-1) and in an excavation of the grounds of Velký špalíček (*fig. 37a*: VŠX-1). A kuttrolf made of blue-green glass was also found in a midden at the kitchen of the Minorite monastery (*fig. 36*: MK5-22) and the same type made of green glass was found in the upper layer of cesspit 4/90 at Mečová Street no. 2 (*fig. 36*: Me4-013; *fig. 37: b, left*). All the above-cited pieces are small, with optical decorations of 15-16 vertical ribs on a domed, bulbous body.

There are two or three kuttrolfs made of colourless, corroded glass that can be considered to be domestic products. A fragment of a neck with the remains of an appended second neck were found in a cesspit filled in the first half of the 15th century at Kobližná Street no. 4 in Brno (*fig. 36*: Kob4-54b). An entire neck with ribs and with the attachment of the second one was found in Olomouc (*fig. 36*: OlPrI-069), and it is very likely that a rounded part of a ribbed bottleneck from Opava also came from a kuttrolf (*fig. 36*: OpKo12-110).

According to finds in the upper layer of cesspit 638/00 at Dominikánská Street no. 5, in the first half of the 16th century there were large kuttrolfs made of a slightly greenish glass and with multiple necks in Brno. They have a lobate body and a moulding with a wheel-pressed decoration at the base of the neck (*fig. 36*: D638-03, 23; *fig. 37: c*). The upper part of two necks from cesspit 4 at Mečová Street no. 2 may also belong to this same type (*fig. 36*: Me4-012; *fig. 37: b, right*).

There are no known examples of this type of kuttrolf from Germany. But it appears in the 16th and 17th century in Slovakia (*Füryová – Janovíčková 1986*, 195-197; *Maruniaková 1989*, 306-309, fig. 7; *Hoššo 2003*, Abb. 3: 13) and in Hungary (*Gyürky 1986*, tab. XLVIII below; *Gyürky 1991*, Kép 22: 3, 25: 15, 63: 3). It is therefore possible that the pieces from Brno originally came from that region.

Fig. 37. a) VŠX-1; b) Me4-012 (on the left), 013; c) Me638-03, 23.
Obr. 37. a) VŠX-1; b) Me4-012, 013; c) Me638-03, 23.



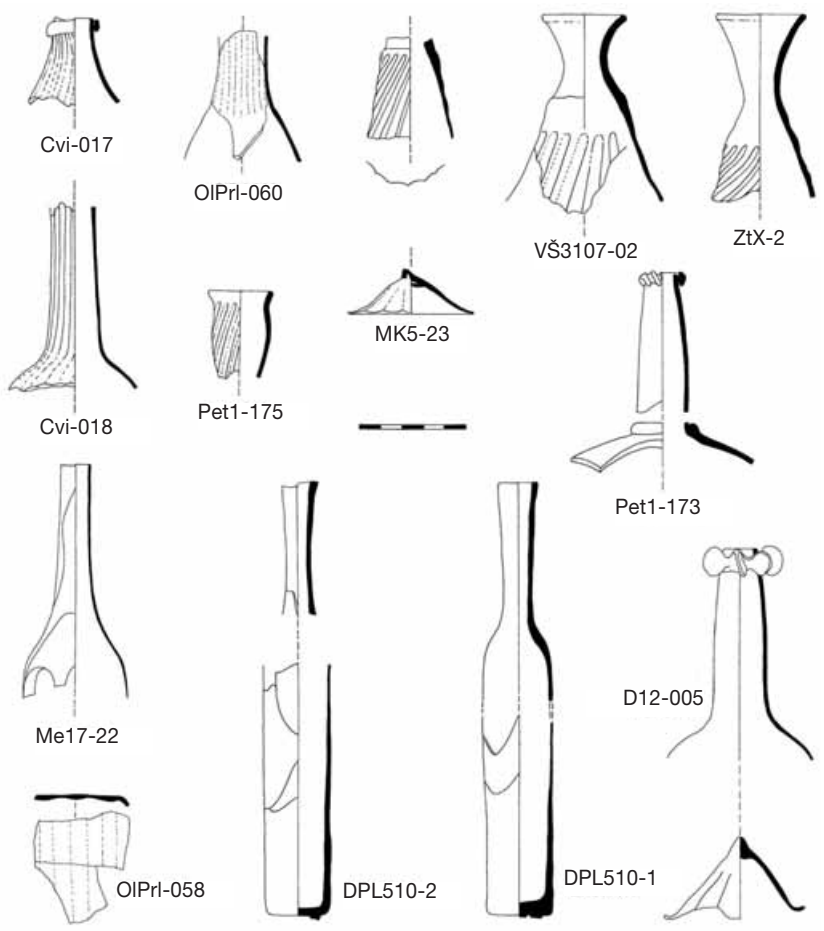


Fig. 38. Bottle tableware. Last quarter of the 15th century – circa 1550/60.
Obr. 38. Stolní lahve. Poslední čtvrtina 15. století – ca 1550/60.

We can also include, in the category of glass tableware, bottles made of blue-green and green glass with a pinched thread around the rim (*fig. 38*: D12-005, Pet1-173), small slender bottles for spirits made of a bluish and a green glass (*fig. 38*: Me17-22, DPL510-1, 2), and numerous smaller bottles optically decorated with slanted ribs made of colourless and blue-green glass (*fig. 38*: MK5-23, ZtX-2, VŠ3107-02, OlPrI-060). Evidence of a bottle made in Italy is found in a fragment of a body made of blue soda-lime glass found in Olomouc[11)] (OlPrI-059). The necks of three bottles made of completely colourless, pure glass, found at the Cvilín Castle, are unquestionably of the same origin (*fig. 38*: Cvi-017, 018).

Before the middle of the 16th century, there is occasionally also evidence of square (e. g. *fig. 38*: OlPrI-058) and cylindrical bottles (OlPrI-072, 085, OlŽN2-220 – blue-green glass), which became widespread in the Renaissance.

So-called "pilgrim bottles" constitute a special group, optically decorated with ribbing and with two handles on the shoulders of the bottle. In Germany, in the first half of the 16th century they were made of green glass (*Baumgartner – Krueger 1988*, 424-427). Finds from Olomouc and Brno are made of a slightly greenish or yellowish glass (*fig. 36*: OlHr7-334, D12-016-017, ZtX-1).

Note 11:
I would like to thank Katharina Müller of the Technisches Universität Berlin for kindly carrying out the analyses.

IV.6 Jugs (*figs. 39, 40*)

Jugs made of glass were rare throughout the Middle Ages. Ceramic products were more practical, and stoneware or metal were more expensive. Only one jug made of greenish glass from the second half of the 15th century is known in Brno, from Starobrněnská Street no. 5 (*fig. 39*: Stb5-21). A jug with a spherical body thickly coiled with thread dating to the end of the 15th century is known

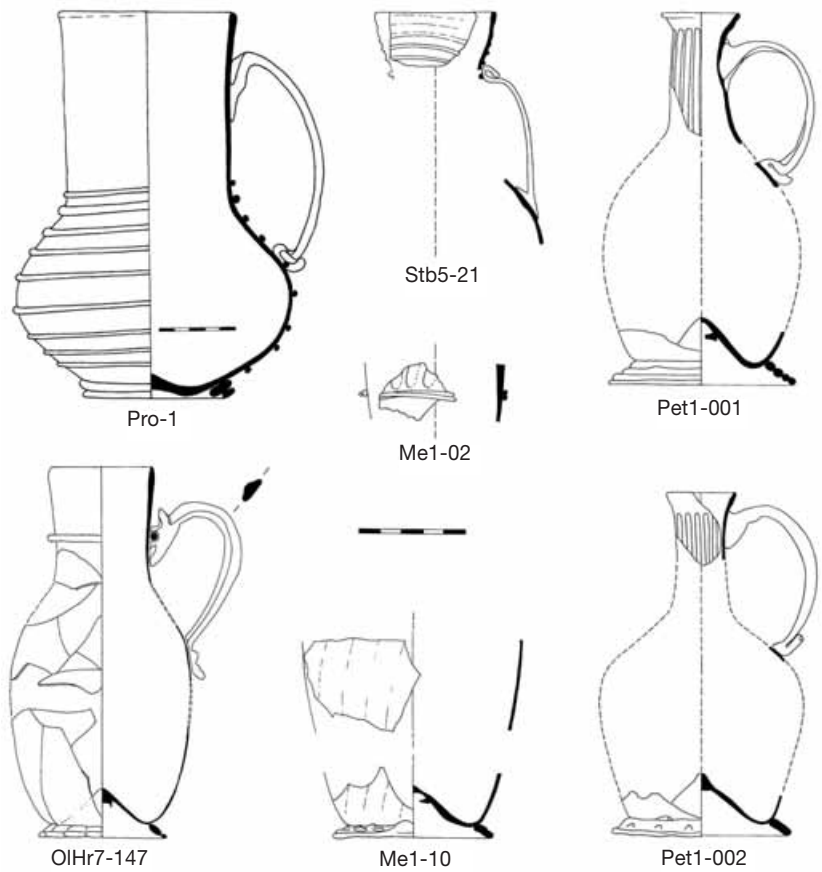


Fig. 39. Jugs. Second half of the 15th century – circa 1550/60.
Obr. 39. Džbány. 2. polovina 15. století – ca 1550/60.

Fig. 40. Pro-1.
Obr. 40. Pro-1.

from Prostějov (*fig. 39*: Pro-1; *fig. 40*). The jug became a standard part of household ware around the middle of the 16th century. Usually, they feature optical ribbed decorations made of a slightly greenish and, less often, blue glass (*fig. 39*: Pet1-001, 002, Me1-02, 10, OlHr7-147).

IV.7 Storage bottles (*fig. 41*)

Bottles of various sizes used to store liquids appear relatively late. They appear rarely even in the second half of the 15th century, in the form of simple, pear-shaped bottles. The glass is greenish, impure, and often entirely corroded. Usually all that has survived is the pincered base without any other finishing or with a slightly tapered neck with a thread coiled around the rim or tilted and without a thread. Alongside some smooth specimens (NS521-18) there is also an example of a bottle optically decorated with ribs (*fig. 41*: Or10-08). Small bottles, intended for medicines, are very rare (Me7-16).

From the end of the 15th century and in the first half of the 16th century, storage bottles became more numerous and more diverse in size and style. This is evidently related to the spread of domestic glassworks and the greater availability of cheap utility glass. Nevertheless, it is interesting that more bottles are found in cesspits on church grounds than at secular sites. In a well on Žerotín Square in Olomouc there were roughly 13 bottles. Though only fragments of conical necks, neck bases, or bases have survived, in the majority of cases it is possible to detect that these were small pear-shaped bottles (OlŽN2-010, 014, 023, 028, 032, 039, 041, 042, 220, 281, 294, 295, 298). In waste cesspit I/73, the necks of small bottles were preserved (*fig. 44*: OlPrI-078, 091) and from other bottles only small fragments of smooth domed bodies of greenish glass remained

(OlPrI-055, 066, 080, 097, 099, 100). While there was only one bottle found in the upper layer of a well in Petrov (Pet1-030 a 031), a large collection of bottle necks and bases were found in the layer dating to the second half of the 15th century (e. g. *fig. 41*: Pet1- 082, 083).

Around the middle of the 16th century, pear-shaped bottles on a low, blown, bell-shaped foot appear, made of greenish or greyish glass, with dark grey, peeling corrosion. They are smooth (*fig. 41*: Me1-11-13, D12-50, 51), and fewer of them are optically decorated with ribbing (*fig. 41*: D12-46).

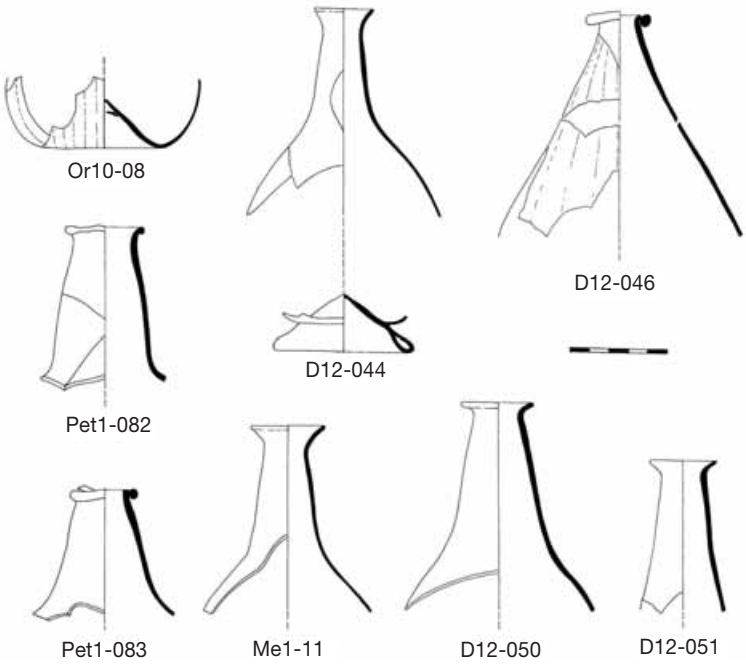


Fig. 41. Storage bottles. Second half of the 15th century – circa 1550/60.
Obr. 41. Zásobní lahve. 2. polovina 15. století – ca 1550/60.

IV.8 Technical glass – lamps and hourglasses (*figs. 42, 43*)

Glass lamps were found in the Czech lands only rarely. Not long ago, I managed to reconstruct one complete lamp found in Brno in a horizon dating from 1270-1350, considered originally to be fragments of smooth beakers. Made of colourless glass, it is tall with a slightly tapered body and an almost vertically tilted mouth. Analogical finds were then identified in other cesspits dating even from the first half of the 15th century. Alongside these undecorated lamps, another mediaeval Brno find is an Islamic lamp, with enamel and gilded decorations (*Sedláčková 2006*, fig. 8: 1).

In the subsequent period, glass lamps were still known only occasionally from Brno. A fragment of the upper part of a lamp dating from the 15th century was found at Náměstí svobody no. 1, and a lower part was from a well in Petrov dating from the first half of the 16th century (*fig. 42*: NS133-15, Pet1-025). These are pieces of colourless glass with a thick layer of brown corrosion. This type of hanging lamp belonged to the assortment of goods produced by glassworks in Hungary (*Gyürky 1986*, tab. VI: 1, 2; *Gyürky 2003*, Abb. 2: 8).

A noteworthy example of a lamp, initially considered to be a goblet, came from cesspit 521/04 at Náměstí svobody no. 9 (*fig. 42*: NS521-01; *fig. 43a, b*: NS521-01), dating from between 1455 and circa 1480/90. This luxury product is unique among mediaeval glass products in the European context, and therefore it warrants special attention, and all the more so given that there are many signs indicating that it was produced in a Moravian glassworks.

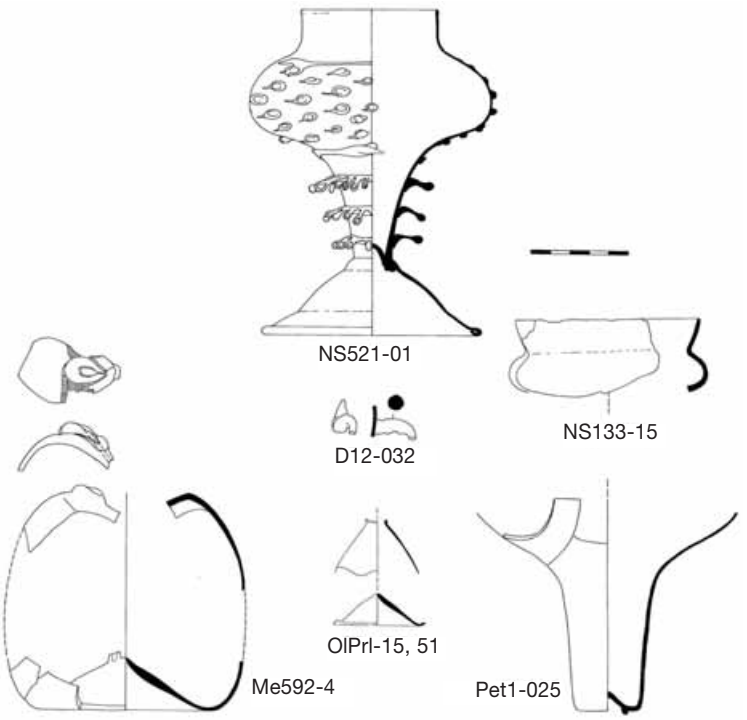


Fig. 42. Lamps. Second half of the 15th century – circa 1550/60.
Obr. 42. Lampy. 2. polovina 15. století – ca 1550/60.

The torso of this lamp, stuck together out of fragments, has a distinctly domed body with a low cylindrical mouth. The convex bulge merges into the tapered lower part of the body. The base was inserted into the open lower part like a stopper, which was already seen on some of the above-mentioned

Fig. 43. a) NS521-01; b) close-up of the decoration.
Obr. 43. a) NS521-01; b) detail výzdoby.

Moravian beakers. A bell-shaped Renaissance foot with a folded back rim was attached to the base. It was richly decorated with five rows of coiled prunts across the body. The lower rows are coiled more or less regularly, while the upper ones are only drops of glass with a trace of coiling. This was also seen in Brno and in Jihlava on several club-shaped beakers from the second half of the 15th century. On the neck and on the lower part of the body there are coiled threads. The tapered lower part is decorated with three rows of mouldings with stretched lobed tips with the impression of a pincer on the ends of them (13, 17 and 19 tips). It is rendered in the same way as the foot on the Olomouc-type beaker. It is 17.7 cm in height, with a diameter at the rim of 7 cm and 11.3 cm at the foot. The originally colourless glass with a greyish undertone is covered with a continuous layer of light grey, glossy corrosion.

The attached bell-shaped foot resembles the Renaissance-style beakers that were produced in Venice from the last third of the 15th century. On these older Venetian beakers, we also find a "skirt" of stretched thread beneath the bowl. The closest examples are the above-mentioned beaker of "the Lords of Deblín", or the beaker of white opaque glass, with the image of a bride and groom and richly decorated with enamel and gilding that comes from the collection of the National Museum in Prague (*Hejna 1953*). From the turn of the 16th century, this feature also appears on products made in German glassworks (*Steppuhn 2003*, 110, cat. no. 3.001). However, to be thorough it should be mentioned that similar decorations are found on a beaker from Prague that forms part of an assemblage dating from between the second half of the 14th and the start of the 15th century (*Janská 1982*, 150-151, 153).

There is no known example of a luxurious table lamp rendered in this style. In Hungary, in addition to simple lamps, there is also a lamp shape with three handles on the body (*Gyürky 1986*, tab. VII: 2-4). A similar type with handles was found in Most (*Černá 2002*, 109, fig. 96: 2) and it may be that a fragment of a body with a handle found in Brno is also an example of this type (*fig. 42*: D12-032). From Venice simple cylindrical lamps made of quality glass were imported to Hungary (*Gyürky 2003*, Abb. 4: 4) and a lamp decorated with white-glass filigree was imported to Bratislava (*Maruniaková 1989*, 330, fig. 18a).

Essentially, not much imagination was expressed in the shapes of lamps or their decorations. Practicality outweighed any decorative function, though the decorative function of the lamp from Brno is very apparent. It was most likely made at a glassworks in Moravia around 1480, when the first Olomouc-type beakers were beginning to appear. The glassmaker abandoned established patterns and instead combined Gothic prunts with the late Gothic feature of a lobed foot, and sometimes even a Renaissance foot.[12)]

To be thorough, I should also mention some fragments of a barrel-shaped vessel with corroded glass found in the cesspit at Mečová Street no. 4 (*fig. 42*: Me592-4), the lower part of which survived, with a pincered base and with the remains of a channel at its peak. On the upper, domed part of the body there is a strangely placed opening, with a thick coiling thread around it, from which another channel extends. I categorised this find among unknown shapes. However, I recently discovered that lamps with channels leading from the base,

Note 12:
Producing a lamp was not a technically demanding or time-consuming activity. It took the glassmaker Jiří Haidl from Nový Bor 20 minutes and 17 steps to produce a replica.

a structure similar to that of the vessel from Brno, were common in the Islamic world (*Notario – Rey de Viñas 2006*, Cat. No. 8-12).[13)]

Hourglasses can also be classified into the category of technical glass. A fragment found of a conical body around 6 cm tall and made of slightly greenish glass is part of an hourglass (*Fig. 42*: OlPrI-011, 051). This shape is found on a functional hourglass dating from the period before 1536, which evidently belonged to Desiderius Erasmus, and on an archaeological find from Cologne, dating probably from the 15th century (*Baumgartner – Krueger 1988*, Cat. No. 563, 564).

Note 13:
The catalogue shows only bottoms with the tubes. However, at the exhibition, for which the catalogue was published, a reconstruction was shown of the entire shape, based on other finds from Andalusia, which is what led me to consider that the Brno vessel had the same function.

IV.9 Laboratory and hygienic glass (*fig. 44*)

Evidence of the use of ceramic vessels in distillation dates back to the fourth millennium BC (*Kurzmann 2000*, 27). From the 9th century AD, distillation apparatus made of glass were already found in the Arab world (e. g. *Notario – Rey de Viñas 2006*, cat. no. 34), but in medieval Europe ceramic materials continued to be used for a long time. It was only from the middle of the 15th century that a glass alembic for distillation appeared and, up to the 17th century, was documented at 80 sites (*Kurzmann 2000*, 57-59, Taf. 3). The closest find is from Buda and it dates from the years 1375-1441. According to written sources, at that time both apothecaries and goldsmiths were working on the lot with the cesspit in which the alembic was found. Both of these professions used distillation apparatus, either to produce acid to process metal or to distil oils from herbs. One product they made was "aqua vitae" – alcohol. Small crucibles and a number of fruit stones were also found on the same lot, so it may have been for either of the two uses (*Gyürky 1982*, 204-208, Abb. 13: 13, 21 and 22). On the castle grounds of Oberstockstall in Lower Austria where an alchemic laboratory was based in circa 1549 to 1580/90, not just parts of a distillation apparatus made of ceramic and glass were found, but also crucibles and cherry stones (*Osten 1998*).

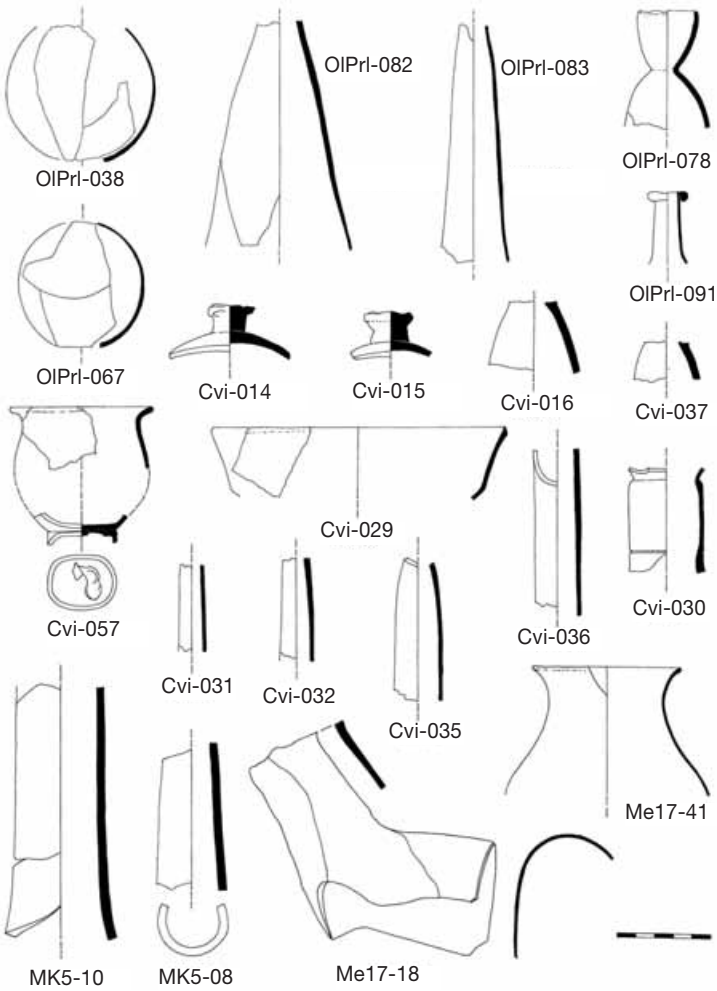


Fig. 44. Laboratory and hygienic glass. End of the 15th century – circa 1550.
Obr. 44. Laboratorní a hygienické sklo. Závěr 15. století – ca 1550.

There is thus far little such evidence from Moravia. A fragment of a ceramic distillation bowl was found at the castle in Lelekovice (*Ungr 1999*, 104). Laboratory and "alchemy" glass do not appear until just before 1540. In cesspit I/73 in Olomouc, fragments were found of two spherical flasks with diameters measuring 8 and 6.7 cm. Originally, they were made of colourless glass, but are now covered with light-beige corrosion. The inside surface of the smaller flask is covered with a continuous layer of black, matte, metal-like material (*fig. 44*: OlPrI-038, 067). The fragment of the larger flask-like vessel – the cucurbit – made of greenish glass is covered on the inside with a layer of lightly burnt clay with a roughly polished surface (OlPrI-061, *Sedláčková ed. 1998*, cat. no. 13.1-2). A massive tube made of thick-walled green glass and a thin tube of a slightly greenish glass may have been parts of the alembic (*fig. 44*: OlPrI-082, 083). A fragment of a spherical body

wrapped around with a ring of several rows can provisionally be interpreted as a still pot – the cucurbit (OlPrI-052). It is interesting in this regard that crucibles with verdigris residue on the bottom were also found in the cesspit (*Bláha 1999*, cat. no. 606-610). It can be assumed that what was run on this lot was a technical type of laboratory, where an hourglass and some bottles could also have been used (*fig. 42*: OlPrI-015, 051; *fig. 44*: OlPrI-078, 091).

Also dating from this period is a collection of laboratory glass from the Cvilín Castle at Krnov, where several alembics, cucurbits, numerous tube fragments, ointment bottles, an albarello, and a wide bowl were also found (*fig. 44*: Cvi-014-016, 029-032, 035-037, 057). This collection was more likely used for medicinal purposes, including the production of alcohol. Somewhat younger are the finds of fragments of thick-walled massive tubes from cesspit 5/89 by the kitchen of the Minorite monastery in Brno (*fig. 44*: MK5-08, 10).

In collections from this period, we relatively often come across fragments of cylindrical necks made of thin-walled glass wrapped around with a thick thread. The inside diameter of one was around 4.5 cm. I believe that this is part of the remains of a urinal. The pear-shaped urinal was found in cesspit 17/90 at Mečová 2, where part of a bedpan made of green glass was also found (*fig. 44*: Me17-41 a 18).

IV.10 Small objects: beads, marbles and rosary rings

A number of small glass playing marbles have been found in Olomouc cesspits. In cesspit 124/96 at Pavelčákova Street no. 22, there were eight pieces found (*Sedláčková 2001*, 446), another eight were found in cesspit 12/96 at Dolní Náměstí no. 20 (*Drobný – Sedláčková 1997a*, 21, fig. VIII, 9), and six were found in a well at Žerotín Square no. 2 (OlŽN2-002, 024, 049, 140, 145, 216). Those that survived intact had a diameter between 10 and 14 mm, and all of them were from secondarily opacified, light to dark grey glass.

From a cesspit at Dolní Náměstí no. 20, a collection of at least 20 rosary rings was found, rolled out of a glass thread with an outside diameter of 20–25 mm. The originally clear, very slightly greenish soda-lime glass was preserved on only one of them (*Sedláčková ed. 1998*, cat. no. 04.1-3, 106, analysis no. 3), while the glass of the others was of a secondarily opacified grey colour.

In Brno, a smooth oval bead made of clear, deep green glass, with a length of 6 mm, was found only in the bottom layer of cesspit 7/90 at Mečová Street no. 2 (Me7-23).

IV.11 Window glass (*fig. 45*)

Window glass ended up in the fill of features certainly only after it had been in use for a long time. Often, the finds are just small fragments located in the layers with construction debris. Nevertheless, it is possible to observe that in objects from the second half of the 15th century the finds are exclusively window discs with sealed rims and a diameter of 13-14 cm (e. g. *fig. 45*: Me17-08) or occasionally 11 cm or 15-16 cm (e. g. *fig. 45*: D12-164). In younger features, window discs with a diameter between 8.5 and 11 cm and with a folded-over rim gradually become more common (e. g. *fig. 45*: DPL531-035, Pet1-003), but the earlier type with the sealed edge continues to be found (e. g. *fig. 45*: D12-054, Pet1-004). Window panels of various shapes cut into the window discs are common (e. g. *fig. 45*: DPL531-036, 037). Only occasionally have lead frame fragments with an "H" profile survived (MK5-19).

Older type glass is usually greenish and less often yellowish in colour. Window discs with a folded-over rim are made of thinner glass with a greenish, yellowish, or often greyish tinge. Some fragments are made of high-quality colourless glass.

Occasionally, the window discs are optically decorated with patterns of ribs and lentiles. Such pieces were found at the Cvilín Castle at Krnov and in cesspit 546/00 at Mečová Street no. 4 in Brno (*fig. 45*: Cvi-100, 101, Me546-4, 5). Analogical fragments are known from Budapest (*Gyürky 1986*, tab. XLV below). The Cvilín fragments and as yet unpublished finds from an excavation of a cesspit on Kolářská Street in Opava[14)] make it possible to assume that they were produced in northern Moravia; finds from Budapest at the same time confirm the previously mentioned assumption about the intensity of contacts between Moravia and Hungary during the reign of Matthias Corvinus and also perhaps under Vladislav Jagello.

Some rare finds are of fragments of sheet glass, usually of high quality (OlPrI-075, Me1-15 – completely colourless and 3 mm thick). Fragments of thick, corroded sheet glass with traces of Schwartzlot paint, found in cesspit 5/89 at the Minorite monastery in Brno, more likely date back to the mediaeval period (MK5-13). However, a fragment of thin glass, covered with Schwartzlot, was also found in a layer dating to the middle of the 16th century on the grounds of Velký špalíček in Brno. The delicate decorations of typically Renaissance ornamental motifs were subsequently scratched off by the time it reached this layer (VŠ3107-1). The fragment was probably part of a decorative box.

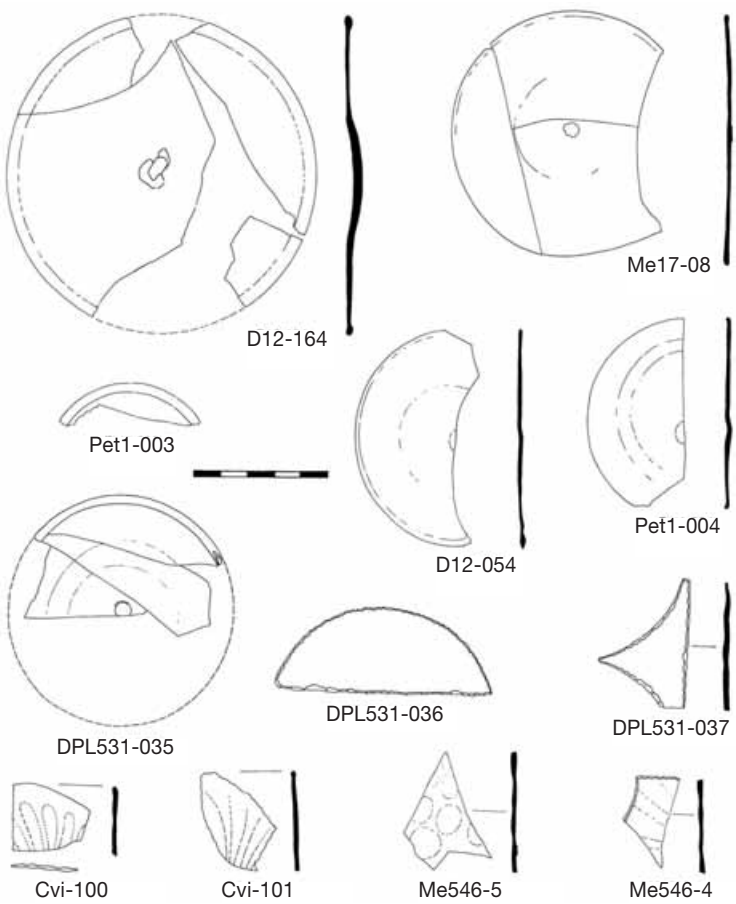


Fig. 45. Window glass.
Second half of the 15th century – circa 1550/60.
Obr. 45. Okenní sklo.
2. polovina 15. – ca 1550/60.

Note 14:
I would like to thank Michal Zezula for allowing me to view the finds from an excavation of the National Institute of the Care of Monuments, Ostrava.

V. Conclusion: The Renaissance arrived in Moravia with glass

I am able to express this opinion after having analysed at least two thousand specimens of hollow and window glass from 34 whole items in Brno, 11 in Olomouc, and 5 in Opava and Cvilín Castle dating from the period around 1450–1560. In this volume of finds, it is possible to observe the gradual changes that led from the Gothic to the Renaissance period:

- The remarkable increase in the amount of glass is certainly linked to the spread of domestic glassmaking. This situation is most striking in Olomouc where, before the middle of the 15th century, there was almost no glass at all. Most features containing glass date from the end of the 15th century. Large collections of glass are also found in Opava, often dozens of vessels, appearing from the middle of the 15th century. In Brno, where glass was imported from roughly the 13th century, this continuous trend continued even after the middle of the 15th century. From approximately 140 features, 34 (whole or just their parts in the form of some layers) of them are from this period and the glass found in them represents approximately 30% of all the glass found in all the features together.

- Around the middle of the 15th century, changes in style begin to become apparent on hollow glass. These changes include new decorative elements on already existing types of tall beakers (Opava, Brno – crescent-shaped prunts and slanted mouldings with wheel-pressed decoration), in Olomouc we can see new shapes and decorations (low club-shaped beakers, zigzags of glass threads, thickly spiralling coiled thread). Imports from the south begin to wane (see the prunted beakers and bottles with funnel-shaped mouths), and glass from Germany reappears (see the first krautstrunk beakers and stangenglas).

- Between 1480/90 and circa 1540, there is a literal boom in domestic glass. Production takes on a mass character and conforms to contemporary trends and to customers' needs – see the Olomouc-type beakers. It is possible to observe a general tendency toward smaller shapes – tall Gothic beakers are replaced with smaller versions. Instead of prunts they have optical decorations, applied threads form zigzags and garlands, or the beakers are wrapped around with a thread with a wheel-pressed decoration. Especially popular in Brno are different types of beakers, variously executed and made of different kinds of glass material. Glass from Germany and Italy inspired production in domestic glassworks. Knowledge of Italian glass reached Moravia through Hungary, but it was imported in the form of glass from Hungarian glassworks. At the close of this period, Renaissance goblets began to appear, along with beakers on a blown bell-shaped foot. Examples of alchemy and technical glass also appear. In Olomouc, a larger number of finds come from Church grounds, while in Brno the absolute majority of finds come from the upper and middle urban stratum.

- Around the middle of the 16th century, glass in Gothic shapes vanishes from the cesspits. Almost all the shapes of the advanced Renaissance appear instead: goblets, beakers, jugs, and bottles. Optical decorations are almost the rule.

Glass finds from this period certainly reflect the political situation in the country, manifesting itself in economic prosperity, trade contacts, and cultural ties. In this regard glass represents a very valuable historical source.[15)]

Note 15:
The work is based entirely on glass finds. Moravian glassworks is an extensive topic that should be studied cooperatively by historians and archivists and subsequently with the aid of field prospecting, which has only been conducted on the Branná estate, but with very positive results (*Gelnar – Štěpán 2000*).

Resumé:

Množství podrobně zpracovaného dutého i okenního skla z více než padesáti celků z Brna, Olomouce, Opavy a dalších lokalit ukazuje, že sklo zůstalo na Moravě v tomto období velmi výraznou složkou hmotné kultury. Bylo možné sledovat postupnou přeměnu gotických tvarů v renesanční, regionální odlišnosti v tvarových variantách, ale i podíl importů a jejich vliv na domácí výrobky.

Rozvoj domácího sklářství souvisel s tendencí industrializace tohoto výrobního odvětví v okolní Evropě i se změnou životního stylu, kterou přinášel přechod k renesanci. Sklo se z kategorie luxusního zboží dostávalo stále více do domácností i středních měšťanských vrstev a stoupala jeho spotřeba. Sklářství v reakci na zvyšující se poptávku potřebovalo vyrábět více a rychleji, a proto docházelo k inovacím. Nejprve se projevily na výzdobných prvcích. Nálepy na vysokých číších se zmenšují do drobné srpečkovité, často až čárkovité formy, zvyšuje se podíl hladkých částí těla (Brno, Opava). Vedle klasických vysokých číší jsou takto zdobené i nižší, kyjovité tvary (Brno, *obr. 1-3*). V průběhu 2. poloviny 15. století se objevují také vysoké číše ovinuté šikmými lištami, zdobenými radélkem (Brno, Opava, *obr. 4*, *5*). Podle nálezů v několika souborech z Brna obě varianty číší dožívaly v 1. polovině 16. století.

Krátce před polovinou 15. století se v Olomouci a později i v Brně, Opavě a na hradu Cvilín objevuje skupina nádob s výzdobou natavené klikatky, hustě ovinuté vlákny i s girlandami, objevují se první číše s optickým dekorem svislých žeber (*obr. 6*, *7*, *8*, *9a-c*).

Mezi posledními desetiletími 15. až 1. polovinou 16. století se často vyskytují zmenšené varianty vysokých číší, tzv. pozdní gotická drobná číše (Brno, Olomouc, Opava, *obr. 10*) a číše olomouckého typu (*obr. 11*, *12a-c*). Obě varianty jsou jednoduše zdobené ovinutými vlákny s radélkem, většina číší olomouckého typu má předfukovaná svislá žebra.

Nečetné německé stangenglasy z modrozeleného skla jsou v nálezech rozptýlené od 1. poloviny 15. do poloviny 16. století. Jedná se o různorodou skupinku, nasvědčující nepravidelnému dovozu z různých středisek. Některé číše tohoto typu z nekvalitního, bezbarvého, případně nazelenalého skla však mohly být vyrobeny v domácích sklárnách. Nejmladší stangenglas z modrého skla již je vlastně renesanční číší na duté zvonovité patce, zdobenou nálepy (*obr. 13*, *14a-c*, *15a-e*).

S rostoucí oblibou menších tvarů souvisely množství i variabilita číšek. Číšky s nálepy, dříve ve velkém množství dovážené do Brna z Itálie, postupně mizí a jsou nahrazovány domácími číškami soudkovitého těla i číškami s vícebokou kupou (*obr. 16*, *17a-b*, *18*, *19a-c*). První krautstrunky z modrozeleného skla se vyskytly již před rokem 1423, poslední jsou datovány do poloviny 16. století. I tento tvar byl vyráběn v domácích sklárnách (*obr. 20*, *21*). Ze 2. čtvrtiny 16. století je v Brně a na novokřtěnských dvorech známá skupina číšek různých tvarů a výzdoby z modrozeleného skla, většinou s hladkým vláknem okolo dna (*obr. 22*, *23a-c*). Dalším typem byla číška z bezbarvého skla, předfukovaná nebo vyfouknutá do formy se svislými žebry. Převahu nálezů tvoří jednoduché tvary dovážené z Itálie i vyráběné doma (*obr. 24*, *25b*).

V poslední čtvrtině 15. století lze na moravských nálezech pozorovat sílící vliv renesančního benátského sklářství zprostředkovaný přes Uhry v době vlády Matyáše Korvína. Obliba benátského skla v Uhrách je doložena písemnými prameny i četnými archeologickými nálezy, typické tvary číší na vysoké zvonovité patce byly napodobovány i v domácích sklárnách. Podle dobových pramenů byl král ctitelem benátského skla, které nakupoval ve velkém množství pro svou potřebu a byl jím obdarováván. O několika obzvláště luxusních číších je známo, že je osobně věnoval svým příznivcům. Jedním z takových královských darů je nepochybně tzv. číše pánů z Deblína, dnes uložená v Britském muzeu v Londýně. Unikátní číše, dochovaná pouze ve čtyřech ne zcela identických exemplářích na světě, byla patrně dodatečně opatřena nápisem s chybným datováním a určením majitelů a podle tohoto nápisu je dnes nazývaná. Méně honosná číška s emailovým dekorem kentaurů a vročením 1518 se dochovala v muzeu v Prostějově (*obr. 33*). Tvar této číšky je předlohou později velmi oblíbených číší na duté zvonovité patce.
Do odpadních jímek se sklo této kvality dostávalo jen ojediněle. Dvě drobné číšky s emailovým dekorem jsou známy pouze z Brna a Olomouce (*obr. 24*; *25: a*, *b*).

Drobné kónické číšky s plošným dekorem čoček, dovážené do Brna od 14. století, byly postupně nahrazeny domácími tvary a kolem poloviny 16. století se mění ve stejně zdobené válcovité číšky se dnem ovinutým vláknem. Tyto číšky i hladké trychtýřovité číšky na zvonovité patce ze svinutého vlákna zůstávají i v repertoáru renesančního skla rudolfinského horizontu (*obr. 26*).

V závěru 15. století se ve střední Evropě znovu objevují poháry. Nejprve se jedná o číšky různých variant, opatřené vyšší, různě utvářenou patkou. Několik takových exemplářů je známo i z Moravy (*obr. 27*, *30*). První klasické poháry začaly severně od Alp vyrábět od roku 1534 sklárny v tyrolském Hallu. Celý pohár z Hallu a zlomky dvou dalších pocházejí z Olomouce; celý pohár je unikátní nejen tvarem a stavem dochování, ale i paralelou s tzv. Lutherovým pohárem, uloženým v Germanische Nationalmuseum v Norimberku (*obr. 28*, *29*). V jímkách datovaných do doby okolo 1550 se již vyskytují výhradně klasické renesanční poháry (*obr. 31*).
Oblíbené číše na duté zvonovité patce se objevují v souborech skla krátce před polovinou 16. století. Nejprve byly nepochybně dováženy ze skláren v Hallu nebo Dolním Rakousku, kolem poloviny století jsou již běžně rozšířené hladké tvary z nazelenalého skla domácí provenience (*obr. 32*).

Ke stolními sklu patří i různé varianty stolních lahví, rozšířené především v Brně. Dožívají lahve se žebry a trychtýřovitým ústím ovinutým modrými vlákny z kvalitního skla, jež jsou nahrazeny lahvemi se stejně zdobeným miskovitým ústím z méně kvalitního skla. Výroba těchto lahví je doložena v Uhrách. Na severu Moravy se v této době objevuje několik lahví s vnitřním prstencem a soudkovitou spodní částí těla, což je tvar známý především z Maďarska (*obr. 34*, *35*). Typický představitel německého skla v 16. století – kutrolf – je doložen jen několika exempláři v Brně, Olomouci a Opavě, opět jak ze zeleného až modrozeleného skla, tak ze skla bezbarvého, silně zkorodovaného. Několik kutrolfů s více hrdly, lalokovitým tělem a lištou s radélkem na plecích má analogie ze 16. a 17. století na Slovensku a v Uhrách. Před polovinou 16. století se objevují první poutnické lahve (*obr. 36*, *37a-c*). Výčet tvarů stolního skla z 1. poloviny 16. století završují menší lahve s optickým dekorem žeber, zdobené vytahovanou lištou na okraji, i hladké, štíhlé lahvičky. Zcela ojediněle se začínají objevovat lahve čtyřboké (*obr. 38*).

Džbán ze skla byl vzácným tvarem po celý středověk a běžným výrobkem se stal teprve kolem poloviny 16. století. Starší exempláře jsou známy jen z Prostějova a z Brna (*obr. 39*, *40*).

V průběhu 2. poloviny 15. a 1. poloviny 16. století se zvyšuje počet nálezů zásobních lahví většinou hruškovitého těla (*obr. 41*).

Ojedinělou ukázkou v evropském kontextu je lampa z Brna, datovaná do doby kolem roku 1480. Setkávají se na ní gotické svinuté nálepy a renesanční patka; tři řady lalokovitě vytahovaných lišt na spodní části těla a sklo silně postižené korozí poukazují na moravský původ v okruhu výroby číší olomouckého typu. Ukázkami běžného typu závěsné lampy jsou dva nálezy z Brna, drobným zlomkem je patrně doložena lampa s oušky. Jako lampa může být s rezervou interpretována i nádoba soudkovitého těla s trubičkou, vedoucí ode dna k otvoru v plecích. Kuželovitá lahvička z Olomouce patrně byla součástí přesýpacích hodin (*obr. 42*, *43: a*, *b*).

Od závěru 15. století se na Moravě poprvé objevují doklady laboratorního skla – alembiky, baňky a trubice, lahvička na mast a albarello (?), vzácně i urinál a „bažant“ (Olomouc, Cvilín a Brno, *obr. 44*).

Mezi množstvím hladkých okenních terčíků upoutává několik nálezů s optickým dekorem, které jsou vedle Brna, Cvilína a Opavy známy také z Budy (*obr. 45*).

Většinu nálezů skla na Moravě můžeme považovat za domácí výrobky. Ukázalo se tak, že v pojednávaném období v žádném případě nedošlo k útlumu domácího sklářství, naopak je patrný jeho velký rozvoj, doložený množstvím i různorodostí vyráběných tvarů. Sortiment byl v menší míře doplňován dovozem skla z německých skláren, z Itálie a především z Maďarska.

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Archaeological excavations of Anabaptist ceramics in Moravia

Archeologické výzkumy novokřtěnecké keramiky na Moravě

Die Erforschung der Keramik der Wiedertäufer in Mähren

Jiří Pajer

Der Beitrag befasst sich mit dem Verzeichnis und der Charakteristik der bisher bekannten Fundorte, auf denen die Produktion der südmährischen Wiedertäufer belegt ist. In früheren Jahren sind Forschungen besonders vom Amateur und Keramiker H. Landsfeld durchgeführt worden, der sich um das Zusammentragen größerer Sammlungen aus Ostrožská Nová Ves, Tavíkovice und Stará Břeclav verdient gemacht hat. Gegenwärtig gehen Grabungen in mehreren Fundorten vonstatten, die im Rahmen des Projekts „Entstehung und Anfänge der Wiedertäufer-Fayence in Mähren" vom Autor des Projekts durchgeführt werden. Die ersten Belege für die Produktion dieser Keramik, die lediglich aus Töpfergeschirr und Kacheln bestehen, lassen sich bis in den Verlauf der zweiten Hälfte des 16. Jahrhunderts verfolgen. Erst in den neunziger Jahren des 16. Jahrhunderts wird die Produktion von attraktiver Fayence eingeführt, die ein höheres soziales Umfeld ansprechen soll. Eben diese Art von Keramik hat die Wiedertäufer berühmt gemacht, die erhaltenen Exemplare sind Teil von staatlichen und Privatsammlungen auf der ganzen Welt, wo sie unter dem veralteten Begriff „Habaner Fayence" geführt werden.

Anabaptists (in Czech "novokřtěnci", but also incorrectly referred to as "habáni") first appeared in Moravia in 1526, and they soon spread to numerous other settlements. However, they flourished most during the period after they had twice been expelled from the Czech lands, in 1535 and 1546, i. e. in the second half of the 16th century, which is described in their chronicle as "die goldene Zeit". Anabaptists had a strong influence on the economic life of Moravia. They were masters in the skills of agricultural and wine production, but they especially excelled in craftwork. According to the principles of their faith, they practised communal ownership and lived communally in housing comprised of numerous dwellings and work buildings. For practising a distinct faith they were expelled from Moravia in 1622 and most of them re-settled on the territory of what is now western Slovakia.

Anabaptist ceramics were produced in Moravia from at least the middle of the 16th century. To date, fifteen production sites have been identified, twelve of which are documented, and three are considered justifiable assumptions (*Pajer 2001b*). The ceramic production of Anabaptists encompasses pottery and stove goods, and from the end of the 16th century they also produced attractive and stylish faience products. In addition to faience, examples of which have been preserved in collections in the Czech Republic and abroad, the production of other types of ceramics is for the most part unknown. It was only through archaeological surveys conducted in production localities that it was possible to substantially and comprehensively enhance our knowledge of this phenomenon. The ceramist and amateur researcher Heřman Landsfeld (1899-1984) pursued this direction of research and during the First Republic studied some excavation sites in western Slovakia (Košolná, Sobotiště). Among his Moravian excavations, the best-known discovery today is the firing oven uncovered in Ostrožská Nová Ves and his survey of ceramic workshops in Stará Břeclav (*Landsfeld 1953*; *1968;* for an interpretation of both finds see *Pajer 1998a*; *1998b*).

As a professional archaeologist I have been following this subject for many years. Among my previous activities in this area it is possible to mention my excavation on a production locality in Strachotín, the results of which were analysed in individual studies and in a summary monograph (*Pajer 1990a*; *1997a*; *2001a*). Other systematic research was conducted as part of a project supported by the Grant Agency of the Czech Republic, titled "The Early Stage of Anabaptist faience in Moravia", which was conducted in 2001-2003, and the continuation of that research is planned in a project titled "The Origin and Early Stages of Anabaptist Faience in Moravia", which was approved for 2006-2008.

During the first period of research, I surveyed production localities in Pouzdřany, Trstěnice, Tavíkovice, Šakvice, Podivín, Kobylí, Žádovice and Vacenovice. Here I would like to provide some brief information about all established sites known to date and how they have contributed to knowledge on Anabaptist ceramics. I also emphasise below the key methodical factors of post-medieval archaeology, applied especially during the identification of localities for archaeological excavations and in the interpretation of the archaeological situation – the existence of written sources (*Pajer 1990b*). The benefits to be drawn from the use of written sources are especially significant in this situation. The sources are drawn from published records of the main chronicle of Moravian Anabaptist communities and its numerous local versions (*Beck 1883*; *Zieglschmid 1943*).

Dambořice (District of Hodonín)

Ceramic production in this village is documented in reports contained in the chronicle of Anabaptists. There it is indicated that in 1619 the imperial army plundered the Anabaptist estate in this village, several buildings burned down, and one of them was a pottery workshop (Hafnerhaus). Another report from April 1621 mentions that during an attack on the settlement in Sobotiště several Anabaptists were killed, one of them a potter from Dambořice (*Beck 1883*, 374, 401).

In 1935 field surveys were conducted in several gardens by J. Vrbas, a regional historian and a national history expert, who made numerous finds, which are now in the collection of the museum in Ždánice. The Moravian Estates Museum in Brno, which during the Nazi occupation held the status of the central institution for Central European research on Anabaptists, focused on research on certain localities where the production of Anabaptist ceramics was assumed to have taken place. F. Pospíšil, an employee at the museum, was assigned to head these activities in 1942 and 1943, but few reports have survived on the results. In Dambořice a firing oven was allegedly discovered, with pieces of ceramic dishes and tiles, but there are no records from the excavation (*Pospíšil 1943*; *Landsfeld 1950*, 250).

In September 1958 H. Landsfeld excavated the garden of house no. 284, which was located on the grounds of the Anabaptists' "lower courtyard". He succeeded in uncovering a part of the brick floor, on which the remains of used tile stones were found, along with pieces of water pipes, and an entire faience lid with manganese glaze. During this same excavation he also examined a site discovered during the occupation, located in the garden of house no. 52. However, the surveys only yielded some unremarkable pieces of tiles and half-finished ceramic dishes. In June 2003 another site was examined, which lies in a more remote location that could not have been directly connected with

the workshop. The find was probably workshop waste, unloaded into a clay pit, and the configuration of the surrounding terrain seems to support this possibility. Ceramics from both of Landsfeld's finds today form part of the collections in the Masaryk Museum in Hodonín.

Finds from Dambořice to date do not provide a clear idea of the extent of local ceramic production, but typologically they fit with the uniform production style of Anabaptists.

Kobylí (District of Břeclav)

This unknown locality was introduced into the literature by H. Landsfeld, who, during surveying in 1959 and 1967, discovered two sites in this locality where Anabaptist ceramics were found, including fragments of some unremarkable faience (*Landsfeld 1970*, 7, 30). In the autumn of 2001 machine probes were used at the locations of the finds, which lie on the grounds of a former estate used by Anabaptists. The first site, in the garden of house no. 407, yielded a set of fragments of faience tiles with circular mosaic patterns on white glaze, which colourfully offsets the geometric-plant decorations. The second site was on lot no. 197, where a new building was being constructed, and where several separate items of workshop waste were discovered. In addition to a large number of ceramic dishes and tiles, rare fragments of preserved faience dishware were also found, which provided some basic information about the characteristics of faience production in Kobylí, especially its technical quality (*Pajer 2002*).

Fig. 1. Fragments of faience dishes colourfully painted, Kobylí 2002.
Obr. 1. Zlomky fajánsového nádobí s barevnou malbou, Kobylí 2002.

The most common ceramic dishes found are pieces of large bowls and three-legged pans, which were used to prepare food in the Anabaptists' shared central kitchens. From analogies with Strachotín it was possible to identify the dishes used during the communal meals: table services comprising large jugs and bowls, in which food was carried to the table, and small globular mugs, small cups and small bowls, which were intended for individual use. Most of the large bowls were decoratively painted with geometric and stylised plant motifs, and one item had the year 1621 inscribed on the bottom. Other types of dishes included albarella: cylindrical and conical narrow receptacles for preserving liquid or loose foodstuffs. Also common are small cylindrical jars for medicinal products, which are very widespread finds even in other Anabaptist settlements. Finds connected with stoves include a large number of tile fragments, including basic flat and corner tiles, stove mantels with various mouldings, and the stove head, which most often took the shape of semi-circular acroterion. The most common decorative motif is a shallow circular indentation on the surface of the face, accompanied by stylised plant motifs in the corners, and often there are even five patelliform hollows. Another type of ornamentation are the mosaic patterns with motifs of interweaving circles or hearts, which form a continuous unified decoration when all the tiles are placed together across the surface of the stove. Both decorative principles, the indented hollows on the surface with

indentations and continuous mosaic patters, are also evident in other Anabaptist workshops.

The fragments of faience dishes are striking in appearance (*fig. 1*). The material used in their production is carefully elutriated, and the white and coloured glazes are dense and have a soft velvety lustre. It should be noted that glazing tends to be the best evidence of the technical skill of a particular workshop, because the quality of the glaze depends on the precise combination of components and especially on careful technical preparations, a key role in which is played by several rounds of mixing and re-mixing of the heated materials (*Bárta 1964*). The colours used are clean and bright; the unusual, soft shade of green is obtained by adding yellow to the colour. The quality of the firing testifies to the extraordinary practical experience of the crafters, but also to the correct placement of the firing oven, which must have been well protected against weather effects.

Much less information relates to the artistic side of Kobylí faience. The surviving fragments of motifs and designs show the customary decorative style of Anabaptist faience, but here it is applied distinctively and is meticulously executed. This is how, for example, the painting on the wide edge of one dish is rendered, ornamentally elaborating the graphic motif of one of the decorative elements, which reveals the artist's perfect craftsmanship. One absolutely unique find is a fragment that has stylised white and manganese painting against a yellow glaze. This combination of colours, which cannot be found in any other current production locality in Moravia, only evolved more fully later on in Slovak territory. As yet no convincing connections have been identified that would make it possible to class some specimen from the surviving collection of faience as coming from Kobylí.

Ostrožská Nová Ves (District of Uherské Hradiště)

After moving from Slovakia H. Landsfeld set up a ceramics workshop in 1940 in the Southern Moravian town of Strážnice, and there he continued in his excavation work. One of his first major activities was excavation on a workshop in Ostrožská Nová Ves.

In this locality Anabaptist ceramic production is documented in written sources. In 1653 the owner of the Ostrožská estate, Gundacker of Lichtenstein, approached the Anabaptist bishop, Andreas Ehrenpreis, in Sobotiště with a question about the earlier production of beautiful dishes in Nová Ves and the excellent quality of the clay there. The bishop confirmed that the quality of the clay there was indeed good, but noted that for the production of high-quality dishware it had been necessary to import clay from another location, such as the estate in Čejč and wherever else possible (*Černohorský 1940*, 54).

Based on this written testimony H. Landsfeld attempted to find the remains of the local ceramics workshop. Although during the occupation he was not granted permission from the Heritage Institute in Brno to conduct excavations in Moravian localities, he pursued his research on the former Lichtenstein estate, which had once been where the Anabaptists in Nová Ves had resided (*fig. 2*). Excavation began on 1st May 1942, and over several days he succeeded in uncovering a complete, preserved firing oven and the adjacent refuse site for scraps. We have knowledge about the progress of the excavation from the perfect photographic documentation taken by professional photographers,

which the researcher hired at his personal expense (*Pajer 1998a*).

The excavation work only lasted to May 1942 when the relevant officials found out about the dig and prohibited the continuation of excavation. H. Landsfeld was order to hand over all the materials he had discovered to the Museum of Moravian Slovakia in Uherské Hradiště by the end of the year; the dismantled pieces of the base of the firing oven were also handed over and became part of the museum's collection. After some delays, by the end of 1942 the set of fragments was also handed over, which contained, according to a surviving copy of the inventory, 5788 inventoried items. However, the material handed over only made up about one-third of the entire stock, and Landsfeld kept the other finds in his own collection. The documentation and remains of the pottery oven handed over were deliberately and irrevocably destroyed at the end of the 1950s, when the museum's old exhibit was closed. All that survived was some of the material from Landsfeld's collection which, after his death, was sold to various collectors and to collections at several institutions. (Paradoxically, most of that material was acquired by the Museum of Moravian Slovakia in Uherské Hradiště again, and by the National Institute of Folk Culture in Strážnice.)

Fig. 2. Excavation conducted by H. Landsfeld in Ostrožská Nová Ves, May 1942.
Obr. 2. Výzkum H. Landsfelda v Ostrožské Nové Vsi, květen 1942.

Although most of the collection was destroyed or broken up, the most significant find was the firing oven itself, which remains the only recorded specimen of its kind in Moravia. When the foundations were being taken apart for the use of the museum, the remains of two older and smaller firing devices were discovered, but they were not documented in as much detail as the younger, larger oven. Based on the researcher's information (*Landsfeld 1942*) and on the plan and photographs that survived from the excavation, it is possible to create a reliable description of the large oven, complete with technical references to its individual parts, which remained a part of traditional folk ceramic production in western Slovakia, where even in the 19th century the same type of firing oven was still being used (*Landsfeld 1950*).

Fig. 3. Excavated foundations of the firing oven. Excavation by H. Landsfeld, Ostrožská Nová Ves 1942.
Obr. 3. Odkryté základy vypalovací pece. Výzkum H. Landsfelda, Ostrožská Nová Ves 1942.

On the outside the oven was rectangular in shape and approximately 300 x 400 centimetres in size, the inside diameters were around 200 x 380 centimetres and the inside corners were rounded (*fig. 3*). On the front side, there was an opening in the face, and beneath it there was an arched and brick-lined pit with a curved face (the so-called "inferno"), to enable easier manipulation for stoking and for clearing away the ash from the small channels. Inside the oven there were three arched transverse channels (one of them was walled in – a dead end), into which thin pieces of firewood were inserted during firing to attain the strongest possible heat (*fig. 4*). The spaces between the channels were covered with earthen plates through which the heat was conveyed into the oven. This spot, with strongest heat, was used for fusing the glazes and colours, which were created

Fig. 4. A detailed view of the channels in the firing oven. Excavation by H. Landsfeld, Ostrožská Nová Ves 1942.
Obr. 4. Detailní pohled na kanálky vypalovací pece. Výzkum H. Landsfelda, Ostrožská Nová Ves 1942.

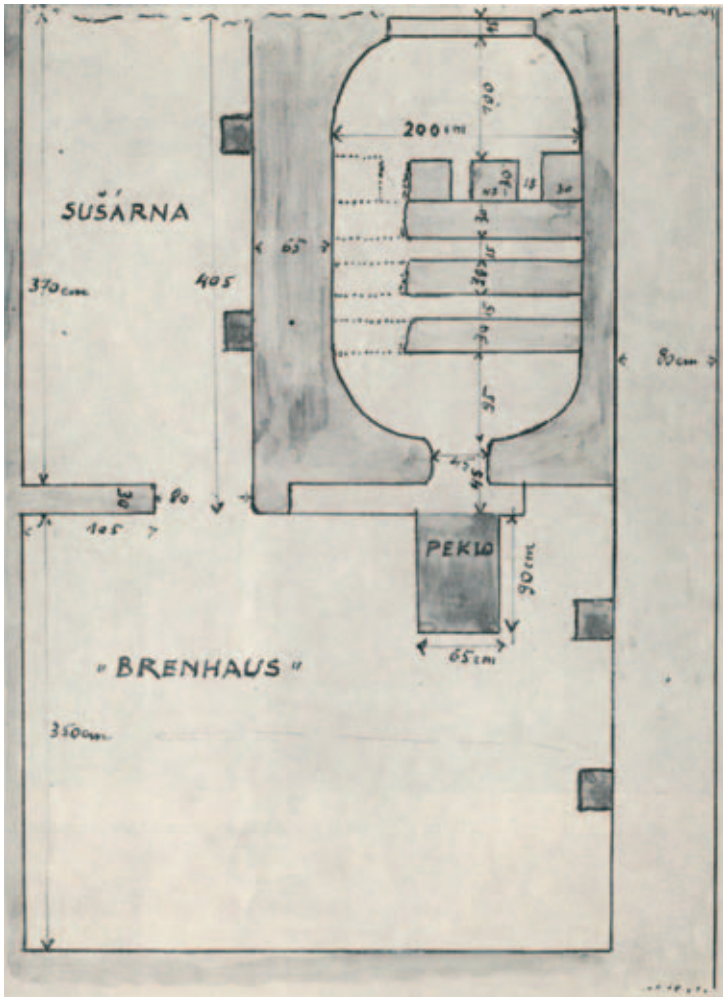

Fig. 5. Layout of the firing oven and surrounding space, based on a drawing by H. Landsfeld, Ostrožská Nová Ves 1942.
Obr. 5. Půdorys vypalovací pece a přilehlých prostor podle nákresu H. Landsfelda, Ostrožská Nová Ves 1942.

by placing finely ground materials into smelting dishes called "little gingerbreads". The entire oven space in which the dishes were placed had to be separated by earthen-coated plates in order to prevent direct contact with the fire and smoke, which would have caused the pottery to reduce and, in the case of faience, would have blackened the surface. At the front the oven was protected by a brick wall, which was called a "štondr", which had an insertion space that was blocked up once the oven was fired up. The foundations of the oven survived on one side to a height of 60 centimetres and on the outer side traces of lime plastering were evident. Based on the presence of remnants of wooden posts the researcher believed that there had been wooden shelves in the wall of the oven, on which raw pottery dried before being fired. There were another two spaces connected with the oven, described as a drying oven and a forehearth (*fig. 5*).

A summary of information connected with firing technology was derived from the technical tools used for placing dishes into the oven, and these tools were first identified in Moravian territory during excavation in Ostrožská Nová Ves, but they have also been found repeatedly in other Anabaptist ceramics workshops. The tools included earthen plates of various shapes and sizes. Smooth-surfaced plates were used to separate the space where items were fired from the heat source, while circular plates with grooves were used to catch the remains of smelted glaze when hollow pottery was being fired. Inventories of production scrap heaps tend to turn up numerous fragments of plates with smelted glazes in various colours, both ordinary pottery glazes and faience, and often the entire bottom of the dish remained sealed into the underlying base. Flat pottery was placed in the oven using a kind of tripod structure with sharp tips, which were called "kredle", inserted between individual pieces to keep them from sticking together. All flat dishes found at production scrapheaps, and those in museums and other collections, show the marks of these tools as three points impressed into the glaze. These points were smoothed using a grindstone, but when the marks on the dish were too pronounced the product ended up in the scrap heap. If we consider all the difficulties involved in ceramic production, especially the production of faience, starting with choosing the right clay, preparing

the glazes and colours and ensuring their adhesion to the surface of the dish up to the final firing stage, wherein maintaining the correct level of heat was of key importance, it must be appreciated how relatively small the amount of workshop scrap that can be found in scrap heaps is, which is general testimony to the technological skill of Anabaptist ceramists.

Ostrožská Nová Ves can be classified as a small centre of production. Dishware and tiles predominate in the stock of finds, and that is similar to the case in other localities. More remarkable ceramic products – in addition to the regular inventory of items – include bowls and a sink, simply decorated with white distemper and an exposed fragment (*fig. 6*). Also, stove products correspond, in terms of technology and ornamentation, to items found in other Anabaptist workshops. The pinnacle of this craftsmanship was the large faience tiles decorated with stylised geometric-plant motifs (*fig. 7*), intended for use in the homes of the nobility. Although similar designs have been documented in fragments at the other Anabaptist production sites, the production in Ostrožská Nová Ves – and also in Stará Břeclav – was its most exquisite form and the quality was certainly attained on a wider scale. At the same time, correlations observed at other sites also emerged here, specifically, that wherever there was a strong presence of faience tile production, there was limited production of faience dishware (*Pajer 1998a,* 177). The materials acquired from Ostrožská Nová Ves did not provide enough conclusive information to be able to characterise in greater detail what local faience production was like, and equally it is not yet possible to identify any pieces of faience work in the stock of surviving items as having been produced at this centre of production. However, excavation at this location is not yet complete, and there is therefore still hope of finding more evidence, even though a re-examination of the remains of the firing oven is impossible owing to the removal of its foundations.

Fig. 6. Ceramic sink decorated with distemper, reconstructed. Excavation by H. Landsfeld, Ostrožská Nová Ves 1942.
Obr. 6. Hrnčířské umývadlo s elementární hlinkovou výzdobou, rekonstruované. Výzkum H. Landsfelda, Ostrožská Nová Ves 1942.

Fig. 7. Large faience stove tile with stylised geometric-plant motifs, reconstructed. Excavation by H. Landsfeld, Ostrožská Nová Ves 1942.
Obr. 7. Velkoformátový fajánsový kachel se stylizovanou geometricko-rostlinnou motivikou, rekonstruovaný. Výzkum H. Landsfelda, Ostrožská Nová Ves 1942.

Podivín (District of Břeclav)

There is a long history of searching for material evidence of Anabaptist faience production in this location, and most searches have focused on the Habánice railroad track. In 1891 and 1892 the archaeologist J. Hladík carried out surveying

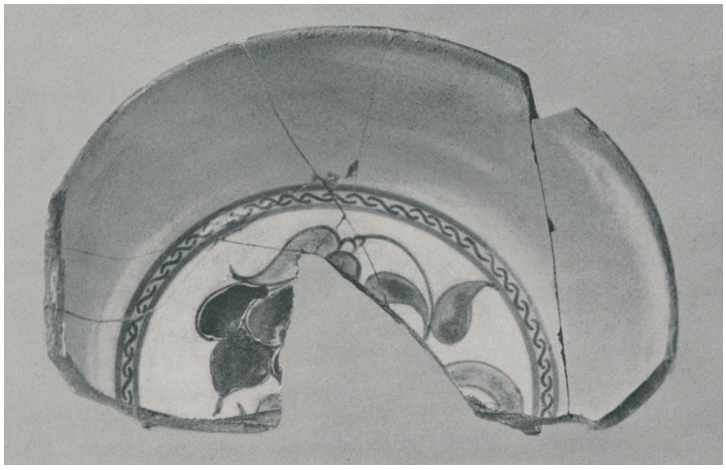

Fig. 8. Part of a faience cup colourfully painted. Excavation by J. Hladík, Podivín – Habánice 1892.
Obr. 8. Část fajánsového šálku s barevnou malbou. Výzkum J. Hladíka, Podivín – Habánice 1892.

there and found fragments of faience ceramics (*Noháč 1911*, 153), and similar evidence was also salvaged there in 1929 by K. Černohorský (*Černohorský 1931*, 20). In 1942 and 1943 the Moravian Museum in Brno surveyed a vast area in Habánice and found a large collection of ceramics, including faience with the date inscribed on them (*Pospíšil 1943*). During the occupation and shortly after 1945 H. Landsfeld conducted excavations there (*Landsfeld 1947a; 1947b*), and in 1979 and 1980 surface collecting and provisional excavations were carried out in Habánice by P. Kurfürst (*Kurfürst 1982*). With some exceptions (*fig. 8*) no material survived from any of the cited excavations that could be used for further analyses.

In 1982 and 1983 I visited Habánice several times and conducted some surface collecting and trial probes. An analysis of archive materials and the terrain indicated that there was a scrap heap of waste at this location next to the adjacent Anabaptist estate. In May 1984 a probe was conducted in the garden of house no. 50 that stands in one part of the village of Habánov. Beneath the topsoil massive burnt layers were discovered with fragments of ceramic dishes and tiles (not faience) and with pieces of iron objects and melted glass (*Pajer 1997b*). According to written sources this was the site levelled by a fire that destroyed an Anabaptist estate, burnt down in 1619 by the imperial army (*Zieglschmid 1943*, 711).

In April 2001 a systematic machine probe was conducted in the northeast part of the former Anabaptist estate, the land of which runs adjacent to the Habánice railroad. However, other than one structure where fragments of household pottery and tiles were found, no evidence of faience production was discovered. In September 2002 attention was directed at Habánice itself, where an area of 180 m^2 was opened up with the removal of topsoil overburden. It was discovered that, beneath the topsoil, there was only a shallow and inconsistent layer of dumped refuse about 10-20 centimetres thick, thicker in only a very few places, and in some places there was no evidence of an under-layer. There were almost no finds in this layer of refuse and with only the occasional discovery of ceramic fragments. In addition to the few fragments of ceramics and stove products, pieces of faience were also found, but only tiny fragments with white or coloured glaze and, in a very few cases, with the remains of painting that provided little conclusive information. The only more valuable find was a fragment of a pottery lid bearing the date 1576; its matching larger part had been already been found here by H. Landsfeld (*Landsfeld 1950*, 115).

In sum, the both probes were a big disappointment, because despite considerable efforts they produced little that contributed meaningfully to the knowledge of ceramics production in Podivín. Even the few records that survived from previous excavation do not make it possible to create a more exact description of local workshops. It can only be confirmed in very general terms that faience production did exist here from the 16th century, but it is impossible at present to connect this centre with the early stages of Anabaptist faience production.

Literature to date has created an unsubstantiated idea about Podivín that it was a place of key importance for the production of Anabaptist faience. Thisnotion, which arose on the basis of an analysis of several scraps retrieved

as surface finds, has been refuted today with new discoveries, mainly those from Strachotín and Vacenovice. A persistent shortcoming, however, is the impossibility of making an objective assessment of what kind of position a place like the Podivín centre really occupied in the context of Anabaptist faience workshops on the whole.

Pouzdřany (District of Břeclav)

Local Anabaptist ceramic production was surveyed at this location in 1999 and 2000. The probes focused on a strip of field just below a former Anabaptist estate, and the first excavation in August 1999 produced a considerable amount of ceramic material, including evidence of faience production. An assessment of the archaeological situation revealed that part of the drainage ditch running into a pond, the existence of which in this location was documented in written records, was filled with waste from the adjacent Anabaptist residence (*Policky 1936*, 103). When the probing was extended in August 2000 it revealed that waste had been deposited on the edge of the pond, but only in thin layers. A systematic machine probe conducted on accessible areas on the grounds of the former Anabaptist estate in October 1999, aimed at discovering the presence of a workshop with a firing oven, produced no results.

Faience fragments, which constitute the minority of finds, provide an idea of the character of local production (*fig. 9*). The production material was typically of poor quality, made out of imperfectly elutriated clay made of a coarse mixture of ingredients. Other imperfections in the products include the application of just very thin layers of a white glaze with a greyish tone, and defective firing; both these attributes result in the glaze flaking off when the object is deposited in the ground. While the colours are typical for Anabaptist faience, they are rendered less impressive by the poor firing. The use of a green colour created out of mixing yellow and blue, which does not blend into a pure green, but instead maintains a murky appearance, is unusual. The painting style is heavy-handed and lacks an artistic feel, and the compositions are rendered with imperfections. Apart from these mainly technological and artistic weaknesses, the stock of finds also contains fragments that are made out of quality ceramic material and are properly fired, but they bear signs of being the work of a different painter. Some of them can be identified as products from the neighbouring production centre of Strachotín, and they may have served as model specimens for local production to draw on. A specific feature of the Pouzdřany workshop is the use of inscriptive decorative elements, evidence of which was found on fragments of four plates and bowls that have the remains of inscriptions in archaic Swabian lowercase letters on their edges.

Fig. 9. Bottom of a faience cup with a rosette in the centre, Pouzdřany 1999.
Obr. 9. Dno fajánsového šálku s centrální rozetou, Pouzdřany 1999.

In a comprehensive overview of evidence of production found in other centres, the Pouzdřany workshop has the poorest quality work. However, Pouzdřany is a location that can be identified with the earliest stages of production of Anabaptist faience. Pouzdřany may have been one of the trial centres, where the practical conditions for introducing faience production were tested.

Fig. 10. Large faience stove tile with stylised geometric-pant motifs, reconstructed: Excavation by H. Landsfeld, Stará Břeclav 1969.
Obr. 10. Velkoformátový fajánsový kachel se stylizovanou geometricko-rostlinnou motivikou, rekonstruovaný. Výzkum H. Landsfelda, Stará Břeclav 1969.

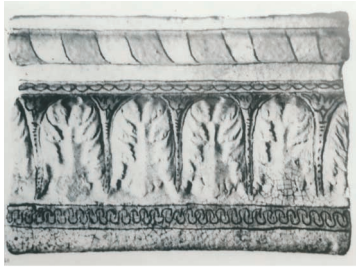

Fig. 11. Faience mantel, reconstructed. Excavation by H. Landsfeld, Stará Břeclav 1969.
Obr. 11. Fajánsová římsa, rekonstruovaná. Výzkum H. Landsfelda, Stará Břeclav 1969.

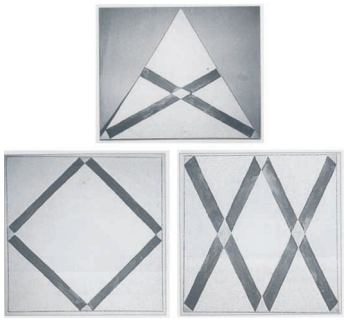

Fig. 12. Faience tiles with rhombus motifs, reconstructed, drawing of H. Landsfeld, Stará Břeclav 1969.
Obr. 12. Fajánsové kachle s kosočtvercovými motivy. Kresebná rekonstrukce H. Landsfelda, Stará Břeclav 1969.

Stará Břeclav (District of Břeclav)

The centre of production in Stará Břeclav is also regarded as one of the localities where research is connected with the name of H. Landsfeld. A random find in 1966 on the land of house no. 46, which identified an Anabaptist settlement unknown to that time, became the impetus for more detailed excavation on the surrounding land. This led to the discovery of and subsequently, in 1968-1970, of house no. 48 (*Landsfeld 1968*). In an analysis of the find circumstances (*Pajer 1998b*) it was discovered that on a relatively small area, delineated by the original Anabaptist residence in the built up area of the village, there lay a thick formation reaching almost four metres deep. A fragment of brick foundations were also found, which the researcher described as the remains of a firing oven. However, this was evidently the remains of some other production structure, even though the filling reveals a number of intact and broken pots and the remains of burnt bonding clay, undoubtedly from the vault of the production structure that was discovered. The excavation yielded a large number of ceramic finds of various kinds, but after the death of the researcher they were dispersed among private owners and the collections of several institutions.

As in all the other production localities, here too were three types of Anabaptist ceramics discovered – pottery, tiles, and faience. The most remarkable of the finds are the faience stoves with decorative reliefs, made out of large foundation tiles and the shapes for the mantel and crown (*figs. 10, 11*). The decorative designs on these tiles are similar to the examples from Ostrožská Nová Ves, but they stand out for their distinct treatment of the motifs. Another kind of faience tile discovered has no decorative reliefs and just a flat painted decoration, which is entirely unique among the Anabaptist work, and has not been found at any other production centre (*fig. 12*). The painted decoration is a simple rhombic design, entered on the large, flat, rectangular tiles, and rendered in blue with broad strips of colour which, in the places where the lines touch, are filled in with yellow, again in a rhombic shape. Covering the entire surface of the stove, they produce a striking image, based on a very simple geometric principle. This image is enhanced at the crown of the stove by triangular tiles decorated with the same design. A stove decorated with this design can be regarded as one of the top examples of the artistic sensibility of the Anabaptist ceramists. Comparative work will be necessary to determine whether this was an original design or an adaptation of a principle already known in some other production environment.

The workshop in Stará Břeclav also adheres to the principle mentioned above that the production of faience dishware is low when the workshop focused on the production of faience tiles. Only a meagre collection of painted faience dishes were discovered, but it was nonetheless possible to identify preserved pieces from a later date, whose origins can be traced to the workshop in Stará Břeclav (*Pajer 1998b*, 57-59; *Pajer 2001c*, 174). All the products bear the signature of the same artist and have the same relatively simple and conservative motifs, and the ceramist put more emphasis on consistently dating the work, which is sometimes done in an ordinary style and others takes on a fancier form. The local workshop can be classified as a small workshop with no relationship to the early stages of Anabaptist faience production, and where production only advanced during the second production period, after 1610.

Strachotín (District of Břeclav)

Fig. 13. Dishes from individual tableware used by the Anabaptists, Strachotín 1983.
Obr. 13. Nádobí z individuálních jídelních souprav novokřtěnců, Strachotín 1983.

The existence of this centre of ceramics production is documented in written records in the municipal archives (*Ries 1930*) and in a report in the Anabaptist chronicle in the year 1620, indicating that after a large fire the previous year the settlement began to rebuild, especially "dass oberhaus wo die Haffner gewohnt" (*Zieglschmid 1943*, 762). The Moravian Museum, which in 1942 and 1943 conducted excavations on some Moravian locations of Anabaptist settlements, also evidently conducted a probe in Strachotín. Evidence of that excavation would have been the tile mould that was found, but unfortunately it has now gone missing. In the 1960s H. Landsfeld also attempted, without success, to find the remains of local ceramic production.

The first discovery occurred here by chance at the end of 1979 during the construction of the reservoir "Nové Mlýny III". Below the grounds of the former Dukla agricultural cooperative (lots no. 862 and no. 865), the edge of a large workshop scrap heap was struck when the drainage canal from Strachotínský pond was being dug. The locality was identified thanks to the work of an amateur archaeologist named J. Tým, from Šakvice, and after an agreement with the Regional Museum in Mikulov – to which regionally the find belonged – responsibility for the research was transferred to what was then the Institute of Folk Culture in Strážnice. In 1980-1982 the find site was located in a flood zone and was not accessible for conducting excavation. In August 1982, during excavation of a Early Medieval graveyard, lying directly adjacent to the grounds of the agricultural cooperative, another site was discovered, with a massive number of Anabaptist ceramics (*Měřínský – Pajer 1984; Pajer 1990a*). In 1983 and 1984, as a result of changes to the water system in the first locality, when water began to be drawn off through the newly built drainage canal, the larger part of the scrap heap was examined during rescue excavation. Owing to ongoing construction of the water system, the excavation was not completed, but part of the site lies outside the reservoir and it is still possible for excavation to be conducted there.

Fig. 14. Cylindrical medicinal vials, Strachotín 1983.
Obr. 14. Válcovité lékárenské nádobky, Strachotín 1983.

The excavation on the Strachotín scrap heap provided an enormous amount of ceramic materials and other finds. Most of the finds were pottery, used by the Anabaptists themselves in their communal home. In addition to kitchenware it was possible to identify – by the shape of the item and the frequency of the finds – the communal and individual tableware of the community, including small bowls, spherical mugs and jugs, many hundreds of which were even found as intact complete sets (*fig. 13*). Equally common finds were various sizes of cylindrical medical vials, used by local barbers to hold medicinal ointments (*fig. 14*). Among the other items, a noteworthy find was a particularly large and diverse collection of decorated pottery, especially large bowls with a fancy geometric-plant decoration, on which the dates are also evident. This collection is unparalleled among the finds in all the other centres excavated. Conversely, stove products were few and relatively unremarkable, and there were almost no faience tiles,

Fig. 15. Part of a faience plate with the motif of a rosette in the centre, decorative inscriptions and the date 1599, Strachotín 1984.
Obr. 15. Části fajánsového talíře s motivem centrální rozety, nápisovým dekorem a letopočtem 1599, Strachotín 1984.

Fig. 16. Fragments of colourfully painted faience dishes, Strachotín 1983.
Obr. 16. Zlomky fajánsového nádobí s barevnou malbou, Strachotín 1983.

which again corresponds to the observation about the correlation between the intensity of faience dishware production and tiles.

Faience production by the ceramists in Strachotín has been analysed in a separate monograph (*Pajer 2001a*). Based on the collection of faience discovered, it was possible to create the first comprehensive taxonomy based on a typology of dishes. In this taxonomy a description is also given of a number of new types of hollow and flat dishes that are not found at all in the surviving collections of faience production. A completely unique and unknown type of work is children's toys and dishes that maintain the exact shape of the original model. An analysis was also made of the faience motifs, and five typical artistic signatures were identified, according to which it was possible to localise the origin of eleven products from the surviving collections of faience production; these include several-dozen floor tiles bearing the emblem of Ditrichstein (*Pajer 1999b; 2001a*, 156-164).

A description of this workshop, which was one of the largest ceramic centres in Moravia, must include mention of a hypothesis about this site that is based on the fact that a considerable amount of imperfect, experimental work has been discovered here. The hypothesis is that Strachotín may have been a training centre for Anabaptist ceramists, and that here they were initiated into the secrets of faience production. However, no evidence has yet been found that could confirm the claim that Strachotín was the oldest centre and was where faience production originated, and where production was first tested before it was introduced at other workshops. Among the artist's styles identified was the work of one ceramist who may be regarded as the best Anabaptist faience painter in Moravia thus far (*figs. 15, 16*).

Šakvice (District of Břeclav)

The assumption that Šakvice was a centre of Anabaptist ceramic production is based on a reference dating from 1603 that mentions the existence of a "potter's house" (Hafnerhaus), and its location matches that of house no. 7 today, which is still referred to as "toufarský" (in Czech, a derivative of the word "toufar" a synonym for "habán" or Moravian Anabaptist) (*Hosák 1924*). The assumption about the possible existence of faience production is also grounded in the generally valid observation thus far that ceramics workshops were not present in every Moravian Anabaptist settlement, but where they did exist in addition to pottery and tiles they also produced faience products (*Pajer 2001a*, 29).

In 2001 probes were conducted in the garden of house no. 7 and in one half of the house no. 230, which is split into two halves. Fire layers dating from the time of the destruction of the original structure were discovered, in which only a small number of pottery fragments were found. Several fragments of faience dishes that may be evidence of local production were only found in survey collecting. This locality warrants further attention.

Tavíkovice (District of Znojmo)

Knowledge of this locality already exists as a result of excavation conducted by the Moravian Museum, though none of the material found has survived. The place of the find was in the garden of house no. 103, in the part of the village called "Toufary", where – after the Second World War – H. Landsfeld also conducted excavations for several years. As part of a grant project in 2001,

Fig. 17. Bottom of a faience cup with stylised plant decorations. Excavation by H. Landsfeld, Tavíkovice 1949.
Obr. 17. Dno fajánsového šálku se stylizovaným rostlinným dekorem. Výzkum H. Landsfelda, Tavíkovice 1949.

Fig. 18. Part of the side of a faience albarello with stylised plant ornamentation, Tavíkovice 2003.
Obr. 18. Část stěny fajánsového albarella se stylizovanou rostlinnou ornamentikou, Tavíkovice 2003.

Fig. 19. Fragments of a globular faience jug with an inscription and marked with the year 1596, Tavíkovice 2001.
Obr. 19. Zlomky kulovitého fajánsového džbánku s nápisem a letopočtem 1596, Tavíkovice 2001.

Fig. 20. Bottom of a faience bowl with a vase and flowers motif, Tavíkovice 2001.
Obr. 20. Dno fajánsové misky s motivem vázy s květinami, Tavíkovice 2001.

I began to conduct excavation on this locality annually. At the start I was able to discover another site on the nearby grounds of the castle park, only thirty metres away from the original find. Both locations are workshop scrap heaps with a huge amount of ceramic waste and with countless replicas of semi-finished simply decorated tiles, only a very selective sample of which could be documented.

The number of tiles found with perfectly rendered artistic patterns suggests that the Tavíkovice workshop specialised in the production of stove products, especially during the first production period, dated on the tile moulds as the years 1573, 1574, 1580 and 1589. Among the designs there is one remarkable motif of a vase with flowers, which is represented in several artistic variations. This is a common Renaissance motif, but in connection with a pottery wheel it is the symbol of the pottery craft. In the early "faience" period tiles can be found which show less of an emphasis on decorative motifs and more of a focus on the production of simple designs with a patelliform indentation in the centre of the face, or a focus on mosaic patterns, which form a continuous design when combined on the body of the stove. Similar development in tile decoration can be seen in other Anabaptist workshops.

A considerable number of faience fragments were also found in both scrap heaps. The collection of finds is predominated by semi-finished products, which mainly provide information about the typology of faience dishware in relation to the typology prepared for the Strachotín collection. The Tavíkovice collection contains all the basic types of dishware represented in that taxonomy, and it also includes an otherwise unknown type of bowl that looks like a faithful copy of the barrel it was modelled on. It was probably used for flower decorations during meals. In terms of structure the Tavíkovice workshop also adheres

Fig. 21. Fragment of a small faience bowl with stylised plant decorations, Tavíkovice 2001.
Obr. 21. Zlomek malé fajánsové misky se stylizovaným rostlinným dekorem, Tavíkovice 2001.

Fig. 22. Part of a faience bowl – test products – with the monograms of the ceramists IH and WH, Tavíkovice 2001.
Obr. 22. Část fajánsové misky – výrobní zkoušky – s dochovanými monogramy výrobců IH a WH, Tavíkovice 2001.

to the uniform style found at the other workshops. The creative skills of the local artists, evident in the decorative patterns used on the tiles, resulted in the creation of exceptionally high-quality versions of some types of dishes. This is the case of several fancy washbasin designs in square and hexagonal shapes, documented in full only in consumer records (*Šikulová 2004*). The sense of design is pleasantly expressed, for example, in the lavabos and in the unusual shapes of the flowerpots. There is relatively little dishware formed from moulds, which include perforated trays and baskets, and trays and bowls with ribbed sides. More common is ribbing created with the aid of segmented moulds or directly by hand. A fondness for relief moulding is also evident in the precisely executed details of some dish shapes, created directly out of the dish material or added onto their sides.

Unlike these unique typological and structural aspects, the Tavíkovice collection provides relatively little information about the decoration of faience dishes. The collection mostly contains fragments with stylised plant motifs which, in just several cases, suggest an idea of what the complete design was like (*figs. 17-21*). Conversely, the remarkable artistry of the decorative painting, from which at least three distinctive styles could be identified, correspond to some of the pieces in the surviving collections of Anabaptist faience; these pieces have not yet been identified in any publications. A piece of a bottom section of an item, with a flower-vase motif, suggests that the Tavíkovice workshop may have been the place of origin of a full set of perforated trays and other tableware marked with the date 1598, which came from the castle in Roudnice (*Kybalová – Novotná 1981*, 28, 96, 97, figs. 3–6). According to evidence, it may also be the place of origin of a large jug that was discovered after the Second World War in the Slavonice Museum and features stylised plant decorations of excellent artistic quality (*Černohorský 1952*, 23, 26). Based on the motifs and the style of painting, the Tavíkovice workshop may also have been the place of origin of two perforated trays dating from the period after 1600, which were part of the collection of the Archbishopric of Olomouc (*Pajer – Kalina 2001*, 55, 56), and the place of origin of a later piece in the surviving collection – a perforated tray dating from 1616 (*Černohorský 1931b*, fig. 9).

A general feature of the Tavíkovice workshop is the high technical quality of the products: quality clay, glaze, colours, and perfect firing. There are very few pieces that show evidence of a firing temperature that was either too low or too high, and very few that have been devalued by the effect of reduction caused by the penetration of smoke into the firing oven. Maintaining the right parameters is very important in firing and has a decisive effect on the final quality of the product. By contrast, the artistic quality of the Tavíkovice products is average and the style is conservative. The material collected shows that, during a period of twenty years, there were no major decorative innovations, whereas in Strachotín and Vacenovice, for example, such innovations are quite visible.

Thus far there is nothing to substantiate the assumption that the Tavíkovice workshop was one of the workshops that had a formative influence on the early stages of Anabaptist faience production. The oldest inscribed date is 1596, and no other inscribed dates have survived; perhaps the Tavíkovice ceramists were not fond of inscribing dates on their work, even though it was explicitly permitted to do so by the rules of the profession (*Zimmermann 1980*, 32). However, the finds provided unusually convincing testimony about the crafters that created faience, about how many of them there were, and about their names, concealed behind inscribed initials. Evidence of these points is provided in one-half of a bowl that was found, which shows signs of having been a test product. It has irregular stains of green and manganese on the surface, and around the bottom the initials of the crafter are inscribed (*fig. 22*). From the design on the preserved part of the bowl, it is evident that each monogram was inscribed within a quadrant, and so there were four names inscribed in total, even though, in this case, only two have survived the monograms IH in blue and WH in yellow. The remaining two will probably not be discovered, but two possibilities worth considering are the monogram AH, which was etched on the reverse of one of the production tools, and the monogram BH, which would refer to Bernard, the head of the workshop, as his name is recorded in contemporary written records (*Kudělková – Zeminová 1961*, 16). The letter H can be interpreted as referring to "Hafner" – potter. This hypothesis about the personnel at the Tavíkovice workshop is quite plausible and it corresponds to the significance and influence of this centre of production.

Trstěnice (District of Znojmo)

Knowledge of this location has existed since the time of the occupation, when the Moravian Museum in Brno conducted excavation in some areas where Anabaptist ceramics production was assumed to have existed. Finds from Trstěnice were allegedly placed with other collections in the Moravian Museum, but today their whereabouts are unknown. Nor is there any information to suggest where the excavations took place.

In 2001 I worked several times on determining the location of the Trstěnice site and on conducting surveys. With the help of the village land registry, it was possible to identify the settlement area of the Anabaptists, the centre of which is located in house no. 60. Some ceramic finds were acquired from a field survey of that site and the surrounding fields. One remarkable find was part of the edge of a shallow faience plate, which featured a perfect decorative rendering of stylised pinecones (*fig. 23*). However, test probes of these areas found no trace

of any site containing ceramics. A subsequent machine probe aimed at examining the site of the croft, house no. 60, revealed a shallow layer where only fragments of faience dishes were found, most of which were glazed in blue. Also found were fragments with the remains of painting on a white base. A more important discovery was made during probes in the courtyard of the building, where stone foundation masonry was revealed and identified as the remains of the outdoor wall of the former residential building occupied by the Anabaptists, which was narrowed during later reconstruction. It was then possible to distinguish the clear remains of the entire original structure in the material of the existing building. This is a unique piece of evidence about the size of Anabaptist residences in Moravia. Analogous structures have only survived in some locations in western Slovakia.

Fig. 23. A fragment of the edge of a faience plate with a pinecone motif, Trstěnice 2001.
Obr. 23. Zlomek podokrají fajánsového talíře s motivem piniových šišek, Trstěnice 2001.

Faience fragments from the Trstěnice site are typically of excellent technical quality, but they only offer a very general idea about the artistry. Nevertheless, in addition to confirming that faience production really did occur in this locality, the discovery suggests the possibility of more possible finds, which would contribute to expanding our knowledge on the scope and content of Anabaptist faience production in Moravia.

Vacenovice (District of Hodonín)

The Moravian Museum did not include this locality in its research. The site was identified by H. Landsfeld, who, in excavations conducted during Second World War and early post-war years, acquired a relatively small number of fragments of pottery and tiles and made a random find of a mould used for perforated platters. The location was selected for excavation in the 1950s by the Museum of Applied Arts in Brno. In 1956 two museum employees, A. Kudělková and M. Zeminová, surveyed the grounds of the former estate of the Anabaptists, mainly the gardens of house nos. 43-46, 244 and 245. In 1957 and 1958 a systematic probe was carried out, mainly in the gardens of house nos. 244 and 46. Sketches and photographs were made to document the xcavation as it progressed, and a logbook of finds was maintained, and all the probes were drawn onto an exact plan of the area. The excavation yielded a large number of ceramic finds, including a remarkable collection of faience and, at the time, it was the largest collection of finds acquired from a centre of production in Moravia using archaeological research methods.

Fig. 24. Part of a large faience bowl depicting a pottery wheel and marked with the year 1604, Vacenovice 2002.
Obr. 24. Část velké fajánsové mísy s vyobrazením hrnčířského kruhu šprušláku a letopočtem 1604, Vacenovice 2002.

Based on an analysis of these finds, I have attempted to create a description of the Vacenovice workshop (*Pajer 1999a*). The pieces were analysed according to typology and structure, and two distinct artistic styles were identified in the painting work. However, from the technical perspective, it was possible

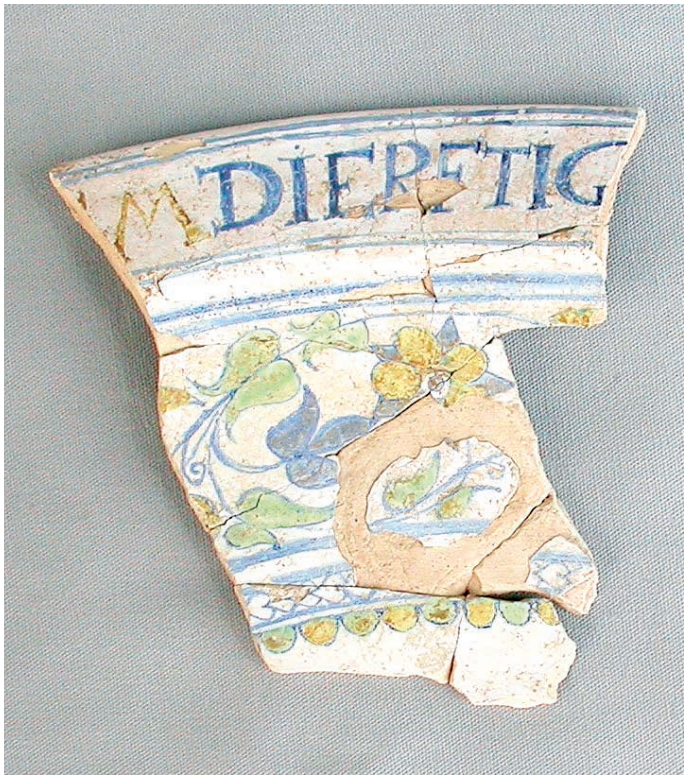

Fig. 25. Part of the edge of a faience bow with decorative inscriptions, Vacenovice 2005.
Obr. 25. Část okraje fajánsové mísy s nápisovým dekorem, Vacenovice 2005.

Fig. 26. Part of a square faience bottle with a stylised plant motif and marked with the year 1605, Vacenovice 2003.
Obr. 26. Část čtyřstěnné fajánsové láhve se stylizovaným rostlinným motivem a letopočtem 1605, Vacenovice 2003.

to note serious flaws in the work caused during the firing process, which left traces of scorching and a blackening resulting from smoke penetration, thus decreasing the value of the products.

The first probe on a site in Vacenovice was carried out as part of a research project in September 2002. The excavation began in the garden of house no. 244 and expanded onto the land of the adjacent house nos. 45 and 44 and in the opposite direction to house no. 245. The most important discovery during the period of work was object no. 6 from the garden of house no. 44, which contained a large amount of well-preserved faience fragments. When the excavation continued the next year – starting at the end of April – several waste pits were discovered on the land of house no. 45, the most useful of which was object no. 6C, which contained an enormous amount of semi-finished toys and more faience dishes. In the autumn of 2003, the excavation focused on the garden of house no. 46, to which the researchers had not yet had access. It was there that the largest number of significant material was obtained. The finds were part of workshop waste, either deposited across the across the area in layers or placed in deliberately excavated waste pits. It was found that the previous excavation at these sites, conducted by the employees of the Museum of Applied Arts in Brno using probes, traces of which were evident in the excavated terrain and corresponded with the drawings on the plan, had systematically missed all the important sites with the largest amount of faience work.

It was only this excavation in 2003 that produced an idea of the size of the Vacenovice locality, which encompasses the property of five former farms and covers an area of almost two hectares. Owing to a lack of funding, the excavation did not continue until 2005, focusing then on examining

Fig. 27. Fragment of the edge of a faience bowl with a stylised plant frieze, Vacenovice 2002.
Obr. 27. Zlomek okraje velké fajánsové mísy se stylizovaným rostlinným vlysem, Vacenovice 2002.

Fig. 28. Fragments of a square faience bottle with a lily-of-the-valley motif, Vacenovice 2002.
Obr. 28. Zlomky čtyřstěnné fajánsové láhve s motivem konvalinek, Vacenovice 2002.

Fig. 29. Fragments of faience dishware with stylised plant motifs, Vacenovice 2003.
Obr. 29. Zlomky fajánsového nádobí se stylizovanou rostlinnou motivikou, Vacenovice 2003.

Fig. 30. Bottom of a ribbed faience bowl with stylised plant motifs, Vacenovice 2003.
Obr. 30. Dno žebrované fajánsové misky se stylizovaným rostlinným motivem, Vacenovice 2003.ß

Fig. 31. Part of the bottom of a faience bowl with stylised plant decorations, Vacenovice 2005.
Obr. 31. Část dna fajánsové mísy se stylizovaným rostlinným dekorem, Vacenovice 2005.

Fig. 32. Fragment of the edge of a faience bowl with a stylised plant frieze, Vacenovice 2003.
Obr. 32. Zlomek okraje fajánsové misky se stylizovaným rostlinným vlysem, Vacenovice 2003.

Fig. 33. Mould of a cup handle marked with the letter H, the monogram of the ceramist, and the date 1612, front and back view, Vacenovice 2005.
Obr. 33. Formička na šálková ouška s monogramem výrobce H a datací 1612, přední a zadní strana, Vacenovice 2005.

the remains of the garden of house no. 46. Again the work yielded a large collection of finds of highly informative value. In sum, all the excavation conducted in Vacenovice to date produced a substantial amount of material and is the largest collection for use in the study of Moravian Anabaptist faience.

It is not within the scope of this paper to go into all the findings produced by analyses of the Vacenovice collection; the excavation is moreover still not complete and will continue in the coming years as part of a new research project. However, I would like to point out some of the assets of the collection and summarise the most important findings derived from a preliminary evaluation.

One of the biggest assets of the material is the existence of an exact dating, based not only on several dozen finds with the date still inscribed on them, but also on observation of reciprocal stratigraphic relationships, the occurrence of finds across the space and also – of course – on systematically maintaining units of finds. To interpret the field situation, it was possible to draw on written sources, especially chronicle entries by the Anabaptists themselves. The key to determining the chronology was the land of house no. 46, which was filled with workshop waste and refuse from a fire in 1605, when the entire residence was burnt down by Stephan Bocskay's soldiers (*Zieglschmid 1943*, 633). Later this area was used for disposing workshop waste, which was dumped into excavated pits. A comparison of material from both places provides information about relative and absolute chronologies and also creates an dea of the differences between individual stages of development of Anabaptist faience. An analogical field situation, though not always as pronounced, existed on the other building lots. It was possible to narrow the dating of the individual faience pieces down to within just a five-year range.

Important findings were also obtained about the producers of the Vacenovice ceramics. Their work is documented by the presence of the repeated use of the same symbol on individual faience products and on pottery dishes, and occasionally even on the production tools. Again this confirms the fact that the producers of both goods and the tiles were the same people, and in practice there were no specialised faience ceramists. In addition to the appearance of initials, in one instance the producer's full surname, "Heine", is inscribed on the bottom of a decorated pottery bowl. Each ceramist had a distinctive artistic signature and a characteristic approach to decoration, which is readily distinguishable even in analogical decorative work on pottery dishes. And each ceramist also had a roster of typical motifs that they combined in their own visual compositions. One motif is a uniquely depicted pottery wheel, four examples of which were found (*fig. 24*). Three bowls are decorated with a fragment of a decorative Latin inscription (*fig. 25*). Another feature is the frequent dating of products, especially during the first period, which begins with the years of the oldest inscribed dates – 1597, 1598 and 1599 – and ends with the fateful year of 1605, when production was halted for a period after the brutal enemy invasion. The period after 1610

Fig. 34. Ribbed faience platter on a stand with a rosette motif in the centre, restored, Vacenovice 2003.
Obr. 34. Žebrovaný fajánsový podnos na nožce s centrální rozetou, restaurovaný, Vacenovice 2003.

Fig. 35. Faience tankard with a stylised plant frieze and marked with the date 1609. Restored. Vacenovice 2003.
Obr. 35. Fajánsový korbel s vlysem stylizovaného rostlinného dekoru a vročením 1609. Restaurováno. Vacenovice 2003.

contains some rare examples of painting work on blue glaze, specifically a yellow paint on a rich cobalt- or dark-blue colour against a lighter blue undercoat. There was even one piece that had dark-green painting against a light-green background, which is an extremely rare design in Moravia.

Vacenovice ceramics are typically works of high technical skill and exceptional artistic creativity (*figs. 26-35*). These qualities were certainly what earned this centre of production its renown and may even be the reason why so many of the pieces have been preserved, which can be localised to Vacenovice. In addition to six pieces identified in the study mentioned above (*Pajer 1999a*, 38-43), there are also four pieces from a set of perforated platters bearing a crest of allegiance, made in 1602 for the wedding of Jiří Zikmund of Zástřizl and Alžběta Gedeonka Kotvrdovská of Volešnička (*Kybalová 1995*, figs. 2 and 3). The collection contains parts of complete products and even fragments of the original mould they were shaped in. Other models that were found and that were used to perforate the platters can also be used to link other objects to this location, like, for example, a platter from 1604 in the Museum of Applied Arts in Leipzig (*Černohorský 1931b*, fig. 11) and three perforated platters from the period after 1610 contained in Czech museum collections (*Kybalová – Novotná 1981*, 30, 100, 101, figs. 17-19). The same origin can be assigned to a jug from 1599, which was housed in the destroyed Schlossmuseum in Berlin (*Černohorský 1931a*, figs. 19, 20). The jug was evidently created by a ceramist trained in Strachotín which, as the analysis of the finds in that collection suggested, may have served that function (*Pajer 2001a*, 158), but its origin was traced to Vacenovice, based on the fact that an identical decorative pattern to that of the jug was also found on a large bowl – perhaps meaning they belong to the same set of dishes. It is also possible to confirm Vacenovice as the place of origin of a square bottle from 1609 (*Černohorský 1931a*, figs. 30 and 31), which bears the same motifs and even the same date as a reconstructed tankard from object no. 26/1 on the lot of house no. 45. A platter from 1613 can be identified as the work of the Vacenovice workshop, part of a series of blue-glazed dishes (*Kybalová – Novotná 1981*, 31, 104, fig. 31).

There is nothing yet to support the claim that the Vacenovice workshop produced the oldest Anabaptist faience. All the circumstances seem rather to confirm the assumption mentioned above that this production site emerged – like many others – after a trial period and after the introduction of faience production among Anabaptists.

Žádovice (District of Hodonín)

There are no written records of Anabaptist ceramics production in this locality. H. Landsfeld looked for evidence of production, particularly in the garden of house no. 43, but only a few, inconclusive pieces of pottery and tiles and some monochrome faience were discovered in a probe. Surveying carried out in August 2001, mainly in the gardens of the buildings located in the part of the village called "Túfarský", produced information about the estimated size of the site in Žádovice. Based on that information, in August 2003 a probe was conducted in the garden of house no. 164, where a shallow formation layer was discovered, containing fragments of ceramics, including faience. The fragments are small broken pieces and the glazing is partly cracked, but they contribute to developing a basic description of the Žádovice workshop.

The faience work is delicate and well elutriated and the glazes are clean and only applied in thin layers. The blue and manganese colours are typical of the standard shades used, the green is of a very thin consistency and tends to run, and the yellow has a kind of impure tone and some unknown ingredient has also made it runny. A detailed observation of the technical differences between individual workshops is important and can provide clues for determining the origin of surviving faience work.

Conclusion

A much discussed question, though for many researchers a question already answered, tends to arise in connection with archaeological research on Anabaptist ceramics, about where the Moravian Anabaptists obtained the inspiration for the development and application of faience production in their workshops. And just as all roads lead to Rome, so most researchers incline toward the opinion that there is no other possible source of influence than Italy. The evidence most often cited in support of this claim is the historically proven fact that in the 1560s the Moravian Anabaptist community received their co-religionists exiled from Italy. However, this is surely an incorrect interpretation, because the first Anabaptist faience is only traced a quarter of a century after that historical event, not to mention the fact that nowhere is it confirmed that among the Italian emigrants in Moravia there were producers of faience, as many recklessly claim. It is however possible to fully accept the view that it was Italy that had an influence on the origin and spread of faience in many countries of Europe. But if we consider that the early stages of Anabaptist faience can faience can be traced back to a period when most major European countries were already producing faience and the Anabaptist were among the last to adopt and introduce this form of work, then we would be justified in looking for their source of inspiration in other countries that are much closer culturally and geographically than the more remote Italy. Therefore, it would be more appropriate to speak of mediated Italian influences, which generally spread through Europe and were manifested in many fields of contemporary Renaissance culture, just like many mediated influences from other countries and other cultures. Perhaps the best example of this concept is the Italian *opera perforata* in the *bianchi di Faenza* style, cited as the model for Anabaptist products, although they do not reach anywhere near the level of artistry and technical skill of their alleged counterparts, the masterfully crafted – both artistically

and technically – perforated platters that are the highest achievement of Anabaptist faience work. However, overturning established theories and winning the acceptance of heretic thoughts, but especially finding evidence in support of the hypothesis that the source of inspiration was not Italian but some other source, will be a task requiring an almost Herculean effort.

Resumé:

Novokřtěnci, nesprávně nazývaní jako „habáni", sídlili na Moravě v letech 1526 – 1622. Vynikali v zemědělské výrobě, ale především v mnoha oborech rozvinuté řemeslné výroby, rovněž v produkci keramiky.

Novokřtěnecká keramika vznikala na území Moravy nejméně od poloviny 16. století. Do dnešní doby bylo evidováno 15 lokalit s výrobou této keramiky, z nichž 12 je doloženo nálezy a 3 jsou oprávněně předpokládané. Do okruhu keramické výroby novokřtěnců náleží hrnčířské a kamnářské zboží a od konce 16. století rovněž atraktivní a módní fajánse. Úplný rozsah jejich keramické produkce byl specifikován teprve pomocí archeologických výzkumů. První výzkumy realizoval keramik a amatérský badatel Heřman Landsfeld (1899-1984), z jeho moravských výzkumů je nejvíce známý objev vypalovací pece s přilehlou skládkou výrobního odpadu v Ostrožské Nové Vsi (1942), průzkum keramické výrobny ve Staré Břeclavi (1968-1970) a některé další menší akce v Tavíkovicích, Dambořicích a v Kobylí.

Autor tohoto příspěvku se archeologickým výzkumem výrobních lokalit novokřtěneckých fajánsí zabývá již řadu let. Z jeho dřívější činnosti lze uvést průzkum výrobního centra ve Strachotíně (1982-1984), jehož výsledky byly zhodnoceny v monografii Novokřtěnské fajánse ze Strachotína (2001). Další systematické výzkumy byly realizovány v letech 2001-2003 v rámci projektu „Počátky novokřtěnských fajánsí na Moravě", jejichž pokračování bude náplní navazujícího projektu „Vznik a rozsah výroby novokřtěnských fajánsí na Moravě" pro léta 2006-2008. Za první výzkumné období byly zkoumány výrobní lokality Pouzdřany, Trstěnice, Tavíkovice, Šakvice, Podivín, Kobylí, Žádovice a Vacenovice. Nejvíce materiálu a poznatků poskytly nálezové soubory z Pouzdřan, Tavíkovic a Vacenovic, zatímco z ostatních lokalit byly získány prozatím jen ukázkové soubory s menší vypovídací hodnotou. Ze všech lokalit vynikají především Vacenovice, zkoumané v letech 2002-2005, odkud byl soustředěn nejpočetnější nálezový fond, který umožňuje formulování sumy nových poznatků a provenienční určení mnoha exemplářů dochovaných novokřtěneckých fajánsí z našich i zahraničních sbírek.

I přes značné pracovní úsilí se doposud nepodařilo identifikovat dílnu, v níž byly vyrobeny dvě dosud nejstarší památky novokřtěneckých fajánsí z roku 1593. Nejstarší zjištěné letopočty jsou 1596, 1597 a 1598, pak jejich zastoupení narůstá úměrně k rozvoji výroby tohoto atraktivního a módního artiklu soudobého uměleckého řemesla. V této souvislosti se opět vynořuje mnohokrát diskutovaná otázka, kde novokřtěnci hledali inspiraci pro vznik a zavedení fajánsové výroby ve svých keramických dílnách. Většina badatelů spojuje tento proces přímo s italským prostředím, často bez ohledu na geograficko-historické souvislosti a možnosti soudobé komunikace. Uvážíme-li však, že počátky novokřtěneckých fajánsí lze datovat do období, kdy už většina předních evropských zemí fajánsovou výrobu měla a samotné novokřtěnecké prostředí bylo v tomto procesu přejímání a zavádění jako poslední, pak můžeme oprávněně uvažovat o jeho inspirování i z jiných zemí, které byly Moravě teritoriálně a kulturně mnohem bližší než vzdálená Itálie. Proto by bylo vhodnější hovořit pouze o zprostředkovaných italských vlivech a možnosti přímé účasti při vzniku novokřtěnecké fajánsové produkce hledat spíše v západoevropských zemích.

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A single type of tile stove in various late 15th century social milieus

Jeden typ kachlových kamen v různém sociálním prostředí konce 15. století

Ein Kachelofentyp in verschiedenen sozialen Umfeldern am Ende des 15. Jahrhunderts

Hana Jordánková – Irena Loskotová

Die Grabungen der Gesellschaft Archaia Brno im historischen Stadtkern von Brünn, in der Starobrněnská-Straße und auf dem nahegelegenen Zelný trh-Markt lieferten Fragmente von künstlerisch und technisch hochwertigen Kacheln mit Abbildungen der Turnierszene mit zwei gegeneinander antretenden Rittern und einem Narren. Die ganze Szene symbolisiert wahrscheinlich den Konflikt zwischen Katholizismus und Protestantismus zur Zeit des hussitischen Königs Georg von Podiebrad. Die katholische Seite, vertreten durch den bekrönten Ritter Hynek Bítovský von Lichtenburg, besiegt hier den „hussitischen König" Georg, einem Vertreter des falschen Glaubens. Im Zusammenhang mit der oben beschriebenen Gruppe sind weitere Funde von drei rohe Torsi von Kacheln bemerkenswert (je ein Kachel zu jedem hier angeführten Typ), sind etwa quadratisch und das Hauptmotiv ist mit einem Querbalken unter den Tierfüßen verziert, Spitzbogen mit Wappenschild treten auf dem Kachel bereits nicht mehr auf. Die Bauherren dieser Zimmeröfen waren aufgrund der topographischen Analyse der Brünner Stadthäuser nicht nur Vertreter der Herrengeschlechter, sondern selber auch Brünner Bürger.

Archaeological excavations conducted over recent years by Archaia Brno in the historic city of the same name, and specifically in Starobrněnská Street (*Merta 2001*) and close to Zelný trh (*Peška – Zapletalová 2005*), have yielded fragments of domestic tile stoves displaying a high level of artistry and craftsmanship, and depicting tournament scenes. At both sites this motif is further linked to assemblages of stove tiles showing the New Testament Adoration of the Magi or Three Kings (*Jordánková – Loskotová – Merta 2004*), occasional examples and large collections of which are also known from other, primarily Bohemian and Moravian, sites in both urban and noble milieus.

The more common appearance of tiles with individual figures from the Adoration scene imply that this motif may have been a separate theme adopted for the decoration of stoves. To date, these are known in conjunction with tournament tiles from one heating installation at each of the two sites mentioned above in Brno, but are also known separately from another four sites in the historic core of the city, and from one location immediately beyond the walls at the Brno Gate (*Franz 1903*, 163).

This article, however, will concentrate on the first assemblage referred to, that of the tournament scenes, into which three different decorative motifs may be classed.

The knight riding to the left can, thanks to heraldic elements, be assumed to be Hynek Bítovský of Lichtenburk, one of the leading figures in the Catholic opposition among the Moravian lords to the Bohemian King George of Poděbrady (*fig. 1*). The symbolism of the Catholic coalition is further supported by the association with the coat-of-arms of the Šternberk family. Typologically, these are chamber stove tiles (a full frontal warming face – 185 x 320 mm, semi-cylindrical chamber – cca 100 mm deep), placed in the body of the stove in its terminal section. Fragments of at least six examples (5 with green and 1 with yellow glaze)

Fig. 1. Stove tile bearing the coat-of-arms of Bitovský of Lichtenburk; Brno, Starobrněnská Street no. 8, late 1460s-70s.
Figs. 1, 2 and 4-6 inclusive drawn by Augustin Štrof.
Obr. 1. Kachel s erbovním znamením Bítovských z Lichtenburka, Brno, Starobrněnská 8, konec 60. – 70. léta 15. století.
Obr. 1, 2, 4-6 kresba Augustin Štrof.

Fig. 2. Stove tile bearing the armorial insignia of the lords of Kunštát; Brno, Starobrněnská Street no. 8, late 1460s-70s.
Obr. 2. Kachel s erbovním znamením pánů z Kunštátu, Brno, Starobrněnská 8, konec 60.-70. léta 15. století.

Fig. 4. Stove tile showing a clown; Brno, Starobrněnská Street no. 8, late 1460s-70s.
Obr. 4. Kachel se šaškem, Brno, Starobrněnská 8, konec 60.-70. léta 15. století.

are known from the waste pits within the plot of the house at Starobrněnská Street no. 8.

The second knight is evidently George of Poděbrady himself, judging from the surviving crest and the Kunštát coat-of-arms in the lower left part of the tile (*fig. 2*). Both typologically and sizewise it is comparable to the preceding tile. Green glazed fragments of at least four examples are known from the aforementioned middens at Starobrněnská Street no. 8, and an identical glazed fragment from the Redoubt building in the lower part of Zelný trh. Although this tile is known from fragments coming from two different locations in Brno, and an almost identical variant is also known from the royal palace at Buda (*Holl 1998*, 207-213), the second coat-of-arms survives on none of the pieces found. A guide here may be the ceramic fragment from Rychvald u Lysic Castle (Blansko district), which although it is interpreted in the professional literature as a fragment of a large vessel with the coat-of-arms of the lord of Kunštát (*Zřídkaveselý 1970*, 23; *Plaček 2001*, 555), seems from photographs (*fig. 3*) to be the missing piece from the tile described above. This theory has yet to be verified,

Fig. 3. Ceramic fragment bearing the coat-of-arms of the lords of Kunštát; Rychvald u Lysic Castle (reproduction after *Zřídkaveselý 1970*, 22, fig. 5).
Obr. 3. Keramický zlomek s erbem pánů z Kunštátu, hrad Rychvald u Lysic (reprodukce podle *Zřídkaveselý 1970*, 22, obr. 5).

however, because it has unfortunately not been possible as yet to locate the material obtained during an informative survey on which the Regional Monuments Centre in Brno collaborated in 1959. An argument against the Rychvald fragment actually matching the stove tiles may be found in the presumed abandonment of the castle in the first half of the 15th century. It is last mentioned in written sources for the year 1437, when it was owned by Hynek of Ronov and Mitrov. The still standing castle was obtained by the lords of Ronov through marriage politics from the Kunštát family of Lysice, who had ceased to describe themselves as "of Rychvald" as early as at the beginning of the 15th century (*Zřídkaveselý 1970*, 19).

The third surviving tile type from the assemblage depicts a fool in the typical costume of a medieval clown, finished off with a hood with ass's ears. (*fig. 4*). Green glazed fragments of at least two examples of the same type and size as the preceding two tiles, but this time with a front warming wall cut through, also come from Starobrněnská Street no. 8. The inner edge of the pointed arch is, unlike the tiles with the knights, decorated with regularly spaced bosses, not lacking even armorial shields in the spandrels, although here of course heraldic ornament is replaced by smooth surfaces.

The entire scene evidently has a deeper meaning than simply showing a clash between knights. Rather, it symbolises the conflict between the Catholic and Protestant faiths during the reign of the Calixtine King George of Poděbrady. The Catholic party, represented by the crown-wreathed knight Hynek Bítovský

of Lichtenburk, here wins over the "Hussite king" George, representative of an erroneous faith. His status is further mocked by the drunken, immorally naked fool riding an ass, donkey or mule behind his defeated master. George of Poděbrady had throughout his reign to demonstrate his royal power both diplomatically and militarily. Escalation of the conflict culminated with George's excommunication in 1466. It was most likely in the context of these historical events that the tiles appeared at the end of the 1460s, persisting into the 1470s, when George's rival Matthias Corvinus became head of the Catholic party in Moravia. After George's death (1471), the heraldic elements on the tiles lost their relevance.

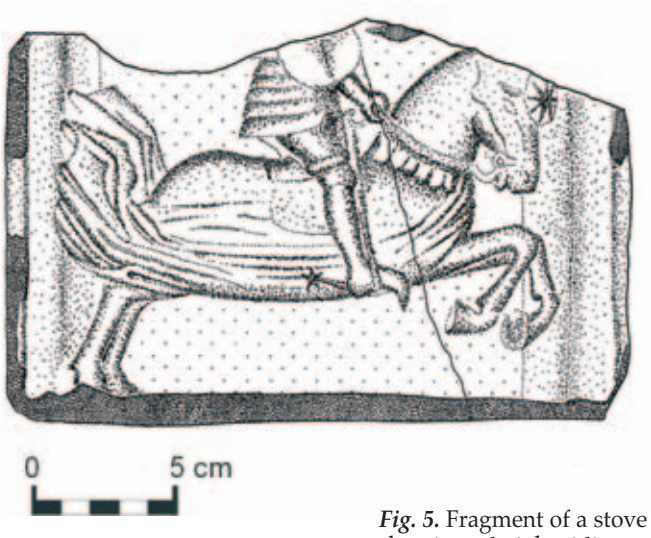


Fig. 5. Fragment of a stove tile showing a knight riding leftwards, from the archaeological excavation of a potter's kiln on Kapucínské Square, late 15th-early 16th century.
Obr. 5. Torzo kachle s vlevo jedoucím rytířem z archeologického výzkumu hrnčířských pecí na Kapucínském nám., konec 15.-počátek 16. století.

In connection with the groups described above, the finds of three carved chambered tile fragments (one of each of the types already described), almost square in format, are also noteworthy; their motifs are terminated by a transverse bar beneath the animals' feet, and the pointed arch with heraldic shields is no longer used. The level of craftsmanship employed is much simpler, with no complex cut-throughs or glazing.

A fragment of a mounted knight facing left (*fig. 5*) was found during archaeological excavations in the vicinity of pottery kilns on Kapucínské nám. (now in the Moravian Provincial Museum, inv. no. 21868, 210 x ? x ? mm). The excavator places the period of operation of both of the investigated kilns to the last quarter of the 15th and the very beginning of the 16th centuries (*Nekuda 1963*, 78). In comparison with the glazed example from Starobrněnská Street, it is clear that this carved fragment is similar, but in its details and dimensions is however a slightly differing copy, with the heraldic decoration in the lower part of the original having lost its statement value. The tournament scene as such, however, remained attractive to later generations of stove builders, as is shown by two further finds.

Fig. 6. Fragment of a stove tile showing a knight riding rightwards, from the fill of the south-western bastion of Špilberk Castle in Brno, 1480s-90s.
Obr. 6. Torzo kachle s vpravo jedoucím rytířem z navážky jihozápadního bastionu brněnského hradu Špilberku, 80.-90. léta 15. století.

A fragment with the second of the knights (*fig. 6*) has been recovered from the fill of the south-western bastion of Špilberk Castle (unpublished, held by the Brno City Museum). During clearance work here, workers in the upper part of the bastion came across a location with a larger accumulation of ceramic fragments dating to the end of the 15th/beginning of the 16th century. The entire assemblage was most likely deposited as waste during construction of the Renaissance bastion, later covered by massive Baroque fortifications. While the fragment is to small to allow the determination of at least one dimension, comparison of the measurable component parts results in the same conclusions being reached as in the previous case. The similarly arranged folds of the caparison cover a longer but lower horse body, on shorter legs (in comparison to the same tile from Starobrněnská Street).

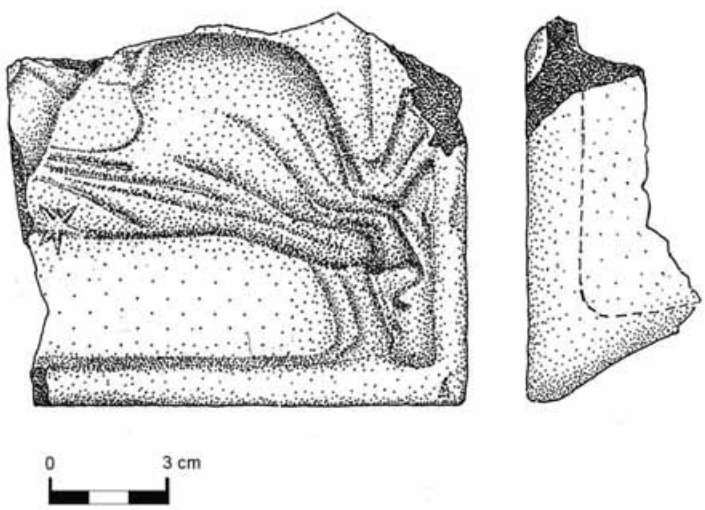
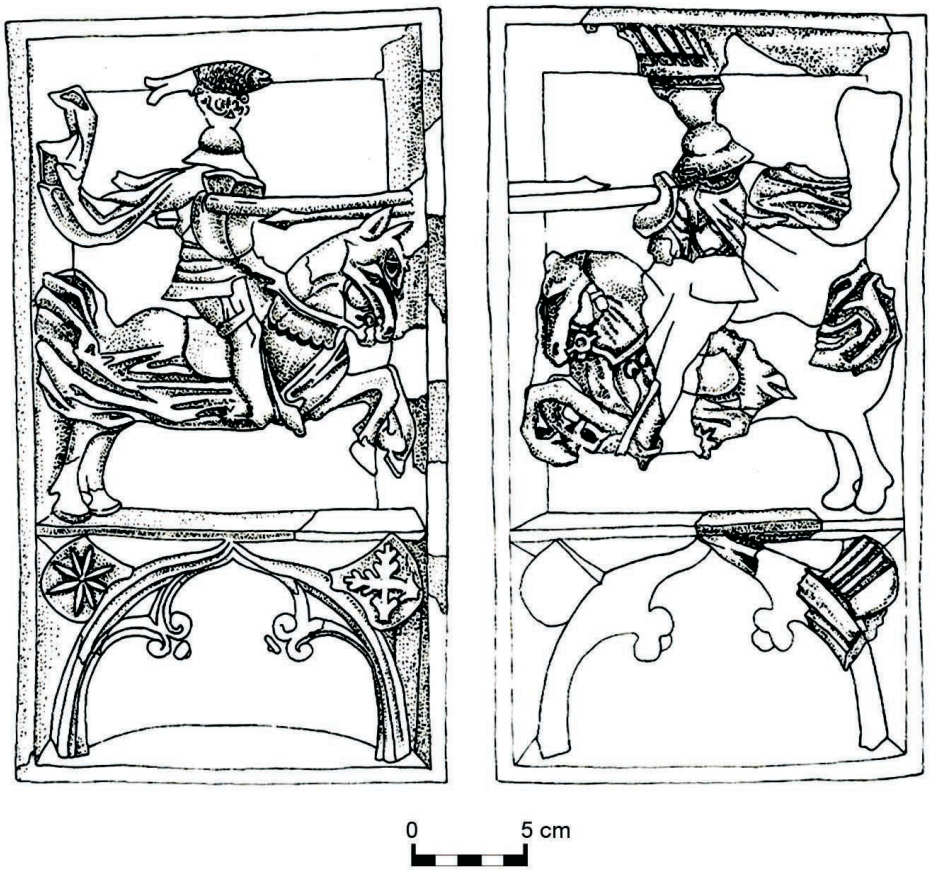


Fig. 7. Fragment of a stove tile with clown; Brno, Staré Brno, Křížová Street no. 30 (reproduction after Franz 1903, 165, fig. 33), second half of the 15th century.
Obr. 7. Torzo kachle se šaškem, Brno, Staré Brno, Křížová 30 (reprodukce podle Franz 1903, 165, obr. 33), druhá polovina 15. století.

The left half of a tile with a travelling clown (*fig. 7*) was found as early as in 1871 during the digging of a gas main in front of a house in Křížová Street (*Franz 1903*, 164–165, fig. 33), i. e. in the medieval suburb. Křížová Street originated on the original line of communication leading from Brno to Znojmo and Vienna, between what is now Mendl Square and the contemporary bridge across the Svratka River. Unfortunately the more detailed finds context is now unknown, and the tile itself has not been traceable for many years. The destruction horizon for the stove from which this tile came cannot be identified. Its origins can, therefore, be inferred only through comparison of the decorative motif with better dated tile finds from elsewhere in Brno. This final example has at its edges the motif of a gnarled stick with opening shoots. This motif began to appear on Brno stove tiles after the middle of the 15th century (cf. *Cejnková – Loskotová 1994*), and its origins may be sought, once again, in the royal workshops of Buda in the 1430s (e. g. *Holl 1998*, 183). A more precise assessment of the period in which the tile was made is therefore reliant on the appearance of the figures of the two knights, or rather of copies thereof, as the original from Starobrněnská Street lacks the same motif at the sides. A metric comparison is not possible, given the circumstances outlined above. The published depictions of this tile, including of the shape of the chamber, support the theory of the creation of a new matrix, as in the cases of the tiles with knights.

Fig. 8. A pair of knights, from the royal palace at Buda, last third of the 15th century (reproduction after Holl 1998, 209, fig. 61).
Obr. 8. Dvojice rytířů z budínského královského paláce, poslední třetina 15. století (reprodukce podle Holl 1998, 209, obr. 61).



The figures of both knights are also to be found in the tile material from the royal palace in Buda (*fig. 8*). Rather than being accompanied by a clown, here they are perhaps related to a tile fragment with a lady observing the clash of the knights from a balcony (*Holl 1998*, 209, fig. 62). The few, green-glazed fragments make possible the almost complete reconstruction of a tile with a cut-through warming face showing the left-facing knight (190 x 328 x 70 mm); the same has been possible to a lesser degree for his opponent.

A more detailed comparison of the Buda knights with those from Starobrněnská Street in Brno, however, reveals fine differences, attesting to their having been made using different moulds. These differences appear above all in the shaping of the sallet with the royal crown and crest of the left-facing knight, in the folds of his opponent's cape and the position of the front legs of his cantering mount, as well as in the means of terminating the bosses standing out from the arch. These fleur-de-lys terminals were, however, evidently made separately, and attached to the inner side of the pointed arch, as is indicated by traces of edge carving at the positions where they are presumed to have been joined. This feeling is also supported by the smooth shape of the arch ribs, without such bosses, in the Brno examples, the warming faces of which were not cut through. They therefore originated in a simple print from a mould that had no such terminals. The overall dimensions of the warming faces of the Brno and Buda tiles also differ (those from Buda being around 2.5 % larger). The changes made to the decoration attest to the manufacture of a new matrix, modified to meet local demands.

Archive research

In the 15th century, Brno, Olomouc, Jihlava and Znojmo were the foremost of royal boroughs in Moravia; in addition to these, the sovereign also administered Uherské Hradiště, Uničov and Uherský Brod (*Hoffmann 1992*, 288). From the second half of the 14th century until the end of the first decade of the 15th century, Brno was the residential seat of the younger line of the Luxembourgs, who were entrusted with the administration of Moravia (see most recently on this *Mezník 1999*).

The records preserved in the oldest borough tax registers and books of taxes (for the years 1343-1389) confirm that Brno became the temporary abode for many courtiers and provincial officials. It was at two sites (freed from payment of taxes) which in the second half of the 15th century had noble owners, that archaeological excavations in the city centre discovered both the unique collection (on the plot of Starobrněnská Street no. 8, the rear of the plot now being part of the house of the Lords of Kunštát), as well as individual fragments (at what is now the Redoubt Theatre on the corner of Zelný trh and Kapucínské nám.), of the stove tiles with a chivalric theme.

The earliest assemblage of Brno stove tiles with a tournament theme can be dated by analogy to the end of the second third of the 15th century. The original core of what is now the extensive complex of the house of the Lords of Kunštát spread along what is now Dominikánská Street. The oldest part of the house came into the private ownership of Gerhard of Kunštát, chamberlain of the Brno and Znojmo legal districts, sometime before the middle of the 14th century (*Mendl 1935*). By the end of the 1370s the urban properties were in the hands of Erhart the elder of Kunštát (d.1406), the most influential man at the court

of Jošt of Luxemburg. From 1398-1406 he was chamberlain of the Brno legal district, and in 1399 even provincial hetman. It was perhaps this important representative of the Kunštát family who was able to free the house from its obligations to the borough, i. e. from the payment of borough "hearth" taxes (*Štěpán 2002*; *Plaček – Futák 2006*, 213, 306–321). Until 1432 the property can be demonstrated to have remained in the family's hands.

Due to a lack of surviving sources, the next noble owner can be identified only at the beginning of the 1470s – and was again a Kunštát. Although from 1471-1499 the building was termed in the tax records the "*domus domini Prockonis*" (books of taxes, MS 22, fol. 11v; 23, fol. 13v; 24, fol. 13v; 25, fol. 12v), the owner Procek of Kunštát and Opatovice entered as early as 1476 "into association" with Jan Heralt of Kunštát and Plumlov. The latter was the son of that Heralt of Kunštát, of the Líšnice branch of the family, who was executed in August 1444 at Špilberk Castle in Brno; his mother, Kateřina of Častolovice, later married Jan Zajíc of Hazmburk and Kosti. After her death in 1457, Jan Heralt became sole heir to his father's property, his elder sister having already died. He grew up under the eye of his guardian, George of Poděbrady. Prior to 1466 he married Johanka of Kravaře, which brought him the Plumlov estates (in Prostějov district) by way of dowry. At about this time he also obtained the Bohemian castles of Točník and Žebrák in pledge. He was active in the Moravian provincial administration until after the death of his more famous relative, Jiřík ('Little George') of Poděbrady. In 1474 and shortly before his death (1489-1490) he occupied the office of Chamberlain of Olomouc. In the 1470s he increased his holdings. His cousin Procek of Kunštát and Opatovice bequeathed the estates of Líšnice, Kunštát and Lysice to him. After the latter's death (in 1479), Jan Heralt became the sole surviving male member of the Líšnice branch of the Kunštát lords (*Plaček – Futák 2006*, 281–286).

Jan Heralt's only daughter, Lidmila, brought the house in Brno to her husband Vratislav of Pernštejn in 1491 as dowry. Vratislav, in the performance of his accumulating offices as chamberlain – initially in 1486 and in 1490-1496 for the Brno province, as well as in 1490 and 1495-1496 as Lord Chamberlain – must have been working closely with his future father-in-law. In the last two years of his life he stood at the head of the Moravian Estates community as the provincial hetman (1494-1496). The marriage was childless, Lidmila predeceasing her husband, who himself passed away in 1496. The property in Brno then passed to his elder sibling, Vilém of Pernštejn (*Vorel 1999*, 98-99).

The site at the corner of Zelný trh and Kapucínské Square, now occupied by the oldest town theatre in the country, yielded amongst other things stove tile fragments from the assemblage of interest here. The area of what is now the Redoubt was, around the mid-14th century, divided into at least four medieval plots. According to a contract of sale from 1600, the corner house had for a whole 170 years been the property of the noble Liechtenstein family, demonstrably from 1425 (most recently on this see *Flodrová 2005*). As early as in 1422 the Austrian nobleman Hartneid V was present in the city, having been entrusted by Sigismund of Luxembourg with the stewardship of Špilberk Castle. At his own request, for reasons of health, he was to give up this profitable burgravate (*Jordánková – Loskotová 2002*, 571), but this did not mean that he or the other descendants of his cousins ceased to make purchases in the city.

In the second half of the 15th century, the Mikulov line of the Liechtenstein family became active in Moravian, and later Austrian, politics through the sons of Jiří IV (1418-144). The first of these, Jindřich VII, known as 'the Lame' (1446-

1485), although initially sympathising with George of Poděbrady, nevertheless accepted the post of provincial (probably rather military) hetman under Matthias Corvinus (the Moravian provincial hetman having been Ctibor of Tovačov from 1469-1494. His brother Kryštof III (1446-1506) also enjoyed the favour of Matthias Corvinus and later the Roman Emperor Frederick III (1415-1493), during whose reign he was named provincial marshal of Austria (*Falke 1868*; *OSN 1900*; *Winkelbauer 1995*).

The date at which the Brno house of the Liechtensteins was freed from the annual borough dues is unknown. From the surviving contracts of sale it seems that by the turn of the 17th century this noble property was in a very poor state, the building being described as "old and collapsing".

An archival statistical investigation into craft production and trade has shown that during the 15th century the medieval guild stamp was more firmly applied to all of the Moravian boroughs. Many crafts were oriented deliberately towards local needs, and the markets around the city. The four great Moravian boroughs within the Kingdom of Bohemia exceeded the usual craft/agriculture averages at the local markets oriented towards towns in Bohemia (*Válka 1991*, 179).

The promising course of economic development in Brno in the 1440s and 1450s was interrupted by the conflict between the city leaders and George of Poděbrady, and later by the wars between Bohemia and Hungary (see most recently *Kalous 2005*). By the end of the 1470s, according to the data in the tax records, a mere 943 taxpayers were registered – some 14 % fewer than had been the case in 1442 – although crafts were more strongly represented in the structure of the urban population (up to 63 %). The craft base in Brno was represented by a number of the strongest trades: the butchers, the bakers, the maltsters, the gingerbread makers, the cobblers, the tailors, the furriers, the tanners, the coopers and the blacksmiths. The urban poor virtually disappeared, the number of members of the upper classes increased, and so too did the percentage of the artisan middle class. In the late Middle Ages, the city of Brno may be regarded as representative of the "craft cities" (*Sulitková 1984*, 68, 70–71, 74, 80–82; *Válka 1991*, 178–179; *Hoffmann 1992*, 164–168).

In addition to being found in noble houses, the remains of stove tiles with a chivalric theme have also been found in the area of what is now the Capuchin monastery (on Kapucínské Square). In the mid-17th century this male, mendicant order rapidly built its "second" house in Brno, this time within the city, close to the Jewry Gate, on the foundations of seven to nine former townhouses (see most recently *Tejček 2005*, 162). One of these houses had been occupied by tile makers. The tax registers for the years 1499-1504 and 1510 (books of taxes, MS 25, fol. 6r; 26, fol. 6r; 27, fol. 6r) record as taxpayers first a Pavel, and at the beginning of the 16th century a Petr. On the basis of the written record, the presence of the first house owner to be occupied in tile production can be dated to the end of the 15th century. The list of taxpayers for 1477 unfortunately does not record trades, merely names and surnames. Members of the Potters' Guild are last recorded at the site in the middle of the following century (*Nekuda 1963*, 77–78).

The site at which other fragments were found, the south-western bastion of Špilberk Castle in Brno, provides little information as to the person of the stove builder in whose stoves they were places. The body of the bastion was created by dumping earth, which on the rocky hill of Špilberk had to be brought in. From the manner in which the ceramics were deposited, however, it seems likely that they were not contained in the fill, but rather were deposited within it on a single occasion. It seems likely, therefore, that the tiles were

originally part of a stove within the castle. Of the large number of tile finds from Špilberk, however, none has yet been identified as coming from this series (*Jordánková – Loskotová 2002*).

Neither are further details determinable for the clown tile. The written records for the likely date at which the tile was created, the second half of the 15th century, are missing. It most likely comes from one of the wealthier households in the Brno suburbs.

Conclusion

On the basis of a topographical survey of Brno townhouses, it is possible to identify the builders of the stoves with a chivalric theme. In addition to representatives of the noble families of Kunštát (or Pernštejn) and Liechtenstein, these were representatives of Brno craftsmen themselves, perhaps even the makers. The difference was of course not just in the form but also in the execution of the tiles, which of course also determined the price of the finished product. The stove that heated the interior of a noble house within the city walls was in terms of quality the apex of local stovemaking, and the likely high cost of installation reflected this. The tiles described formed high, polygonal or cylindrical flues for the stoves, and in character belonged in very formal spaces. Similar stoves can be found not only in the aforementioned royal palace in Buda, but also in the castles of the leading members of the Bohemian and Moravian nobility, at Lichnice (fragment with the coat-of-arms of the lords of Šternberk in the spandrel – *Holl 1998*, 210, fig. 63), Landštejn (piece of a clown – *Pavlík –Vitanovský 2004*, 375) and Lipnice (tile fragments with both knights).

Even in complete form, the tiles were evidently also made for less demanding customers, as is evident from the carved tile showing Hynek Bítovský of Lichtenburk, now in the Ostrava Museum. The maker used the empty space in the lower part if the tile, beneath the pointed arch, for the family coat-of-arms. This is an older find the origin of which is hypothesized to lie in one of the castles or fortified manors around Ostrava (*Stehlíková 1999*, 227, cat. no. 120), although in the old inventory of collections of the Ostrava Museum the site of discovery is marked as Kobližná Street no. 21, Brno (*Jordánková – Loskotová 2007*, 334).

Tiles for the burgher households of Brno were made without the lower, architectural section bearing heraldic elements. The reduction in the decoration might have been for several reasons, foremost among which could be the irrelevance of heraldic decoration in the given milieu in which the tiles were to be used. A part in the decision was also certainly played by the need for a smaller, preferably square, format for the front warming walls of the tiles. This smaller format not only made production of the actual tiles easier, but also the construction of a simpler stove body with angular flues. Such a stove could easily be placed in smaller spaces. This last reason is also closely linked to the lower installation cost of the work, albeit that the surviving examples are among the better examples of Brno tile production from the late 15th to early 16th centuries.

Resumé:

Archeologické výzkumy brněnské společnosti Archaia Brno prováděné v posledních letech v historickém jádru Brna v ulici Starobrněnské (*Merta 2001*) a na blízkém Zelném trhu (*Peška – Zapletalová 2005*) přinesly zlomky komorových kachlů vysoké výtvarné i řemeslné úrovně, zobrazující turnajovou scénu, do níž lze zařadit tři různé výzdobné motivy. Vlevo jedoucího rytíře je možné díky heraldickým prvkům považovat za Hynka Bítovského z Lichtenburka, jednoho z čelních představitelů katolické opozice moravských pánů proti českému králi Jiřímu z Poděbrad (*obr. 1*). Druhým rytířem je zřejmě sám Jiří z Poděbrad, soudě podle dochovaného klenotu a kunštátského erbu v levé dolní části kachle (*obr. 2*). Třetí dochovaný kachel ze souboru zobrazuje blázna v typickém středověkém šaškovském oděvu (*obr. 4*). Celá scéna má zřejmě hlubší smysl než jen prosté zobrazení rytířského klání. Symbolizuje střet katolické a protestantské víry v době panování kališnického krále Jiřího z Poděbrad. Katolická strana, kterou zastupuje korunou ověnčený rytíř Hynek Bítovský z Lichtenburka, zde vítězí nad „husitským králem" Jiřím, představitelem nepravé víry. V souvislosti s výše popsanou skupinou jsou pozoruhodné nálezy tří režných torz komorových kachlů (po jednom od každého zde uvedeného typu) přibližně čtvercového formátu, kdy je motiv ukončen příčným břevnem pod nohama zvířete a lomený oblouk s erbovními štítky už není na kachlích použit.

Na základě topografického výzkumu brněnských městských domů lze určit stavebníky kachlových kamen s rytířskou tematikou. Vedle reprezentantů panských rodů, Kunštátů (popřípadě Pernštejnů) a Liechtenštejnů to byli sami představitelé brněnských řemeslníků, snad i přímo jejich výrobci. Rozdíl byl ovšem nejen ve vlastních formách, ale také v řemeslném provedení kachlů, od nějž se odvíjí samozřejmě i cena finálního výrobku. Kamna, která vyhřívala interiéry šlechtických domů uvnitř městských hradeb, patří svojí kvalitou ke špičce místní kamnářské produkce a plně tak odpovídají předpokládaným vysokým pořizovacím nákladům. Popisované kachle tvořily vysokou, polygonální až válcovou nástavcovou část kamen, která svým charakterem patří do vysokých reprezentačních prostor. Podobná kamna nacházíme v budínském královském paláci i na sídelních hradech předních příslušníků české a moravské šlechty – Lichnici (zlomek s erbem pánů ze Šternberka ve cviklu – *Holl 1998*, 210, obr. 63), Landštejně (torzo šaška – *Pavlík – Vitanovský 2004*, 375) a Lipnici (zlomky kachlů s oběma rytíři). I v této kompletní podobě byly zřejmě kachle vyráběny pro méně náročné zadavatele, jak dokazuje režný exemplář kachle s Hynkem Bítovským z Lichtenburka, uloženým dnes v ostravském muzeu. Jeho původ byl hypoteticky kladen na některý z hradů či tvrzí v okolí Ostravy (*Stehlíková 1999*, 227, kat. č. 120); ve starém sbírkovém inventáři ostravského muzea je však jako místo nálezu uvedena Kobližná ulice č. 21 v Brně (*Jordánková – Loskotová 2007*, 334). Pro brněnské měšťanské domácnosti byly vyráběny kachle bez spodních, architektonických částí s heraldickými prvky. K redukci výzdoby mohlo vést výrobce několik důvodů. Za hlavní z nich lze považovat neaktuálnost heraldické výzdoby v daném uživatelském prostředí. Svou roli jistě sehrála i potřeba menšího, nejlépe čtvercového formátu čelních vyhřívacích stěn kachlů. Tento zmenšený formát umožňuje nejen snazší výrobu vlastního kachle, ale i stavbu konstrukčně jednoduššího kamnového tělesa s hranolovým tvarem nástavce. Taková kamna lze snáze umístit do nižší vytápěné prostory. S těmito posledními důvody úzce souvisí i nižší pořizovací cena celého díla, byť dochované exempláře patří svým provedením k lepšímu průměru brněnské kachlové produkce konce 15. – počátku 16. století.

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A stove (?) sculpture from Velké Němčice (Břeclav district)

Kamnářská (?) plastika z Velkých Němčic (okr. Břeclav)

Ofenplastik (?) aus Velké Němčice (Kr. Břeclav)

Zdeňka Měchurová

Im Februar 1976 wurde dem Mährischen Landesmuseum in Brünn eine Sammlung von Keramikfragmenten geschenkt, die in einer Tiefe von 3 m beim Aushub der Fundamente für den Bau einer Gaststätte und eines Kinos in Velké Němčice bei Židlochovice (Kr. Břeclav) gefunden worden waren. Es handelt sich um ein paar Fragmente von glasierten und unglasierten renaissancezeitlichen Ofenkacheln (Ende 16. und erste Hälfte 17. Jahrhunderts). Auf den ersten Blick wird unsere Aufmerksamkeit auf eine deutlich herausgearbeitete Reliefplastik eines Mannes in zeitgenössischem Kostüm auf ziegelfarbenem Untergrund gelenkt. Analogien sind bisher keine gefunden worden, weder Funktion noch Zweck dieses Stückes sind eindeutig. Es kann sich um das Fragment eines Gildeabzeichens der Töpfer gehandelt haben, oder um einen Eck- oder Gesimskachel. Diese Auffassung kann sowohl durch Ikonographie als auch Schriftquellen unterstützt werden. Am wenigsten wahrscheinlich erscheint die Möglichkeit der Nutzung in der Gartenarchitektur. Das Motiv gehört in den Kreis der damals beliebten Genrebilder, die Plastik könnte vielleicht die Karikatur eines älteren Soldaten oder Werbers darstellen, eines seinerzeit gut und modisch gekleideten Mannes.

An interesting 'discovery' was made during an inventory of the old collections of the historical archaeological section of the Moravian Museum, which took place after the relocation and repeated reclassification of the above-mentioned collections.

In February 1976 Mr. František Pich presented the then head of department, Dr. Vladimír Nekuda, with a small assemblage of ceramic finds, which had been salvaged from a depth of 3 m during the excavation of foundations for a hotel (or inn) and cinema at Velké Němčice near Židlochovice in Břeclav district; having been preliminarily identified, these were then donated to the Museum.

Description of the finds

1.

A hollow, figurative sculpture of a man with a coarse appearance bordering on the ugly, with a bulbous nose reminiscent of a pig's snout, puffy lips and small "piggish" eyes set close together below a protruding forehead with pronounced eyebrows. On the hair, shown by grooving and cut behind the ears, a small "clown" hat sits somewhat comically in relation to the head, with a broad, thick brim and a flat, conical crown. The character's clothing, too, is reminiscent of a jester, clown or harlequin: the broad circles beneath the neck indicated by deeper, rayed grooves, the doublet implying the now missing bulging sleeves, with perhaps three grooves implying cuts at the shoulder, two semi-circular buttons on the sharply carved lintel. Another three rayed grooves in the right half of the chest seem to indicate a stiffness of clothing. The fragment terminates around two thirds of the way down the trunk; only one shoulder

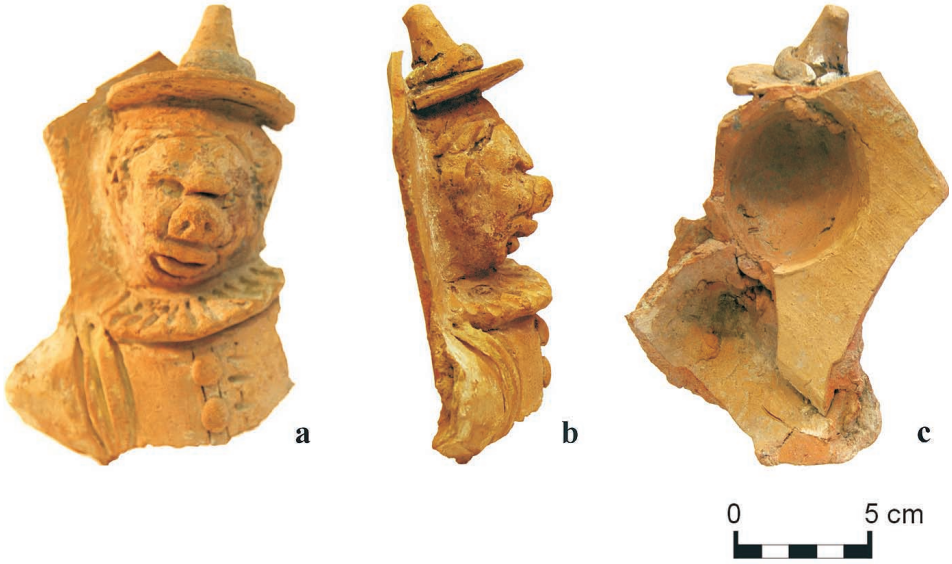


Fig. 1. Relief sculpture from Velké Němčice near Židlochovice (Břeclav district). a) front; b) profile; c) reverse.
Photographs 1-5 by S. Doleželová.
Obr. 1. Reliéfní plastika z Velkých Němčic u Židlochovic (okr. Břeclav). a) pohled zepředu; b) profil; c) rub.
Foto 1-5 S. Doleželová.

survives, while the head is bent to the right. Behind the ears and shoulder there is a flat background surface which the sculpture seems to be emerging from. The highest point, behind the hat, is slightly flared outwards. The material is a grey, brick mass of medium granularity, with occasional small grains of mica and sand. On the face and clothing there are traces of faded, perhaps pastel, colours: red on the face and chin, black on the hair and hat, yellowish on the cut sleeves. From the back, the technique used to attach the flat background to the not overly worked hollow sculpture by attaching whilst wet and cutting is clearly visible. On the reverse of the background, fine grooves made by grains during turning or removal from a wheel are apparent. The unsmoothed hollows of the head and chest indicate the method of pasting employed: the body, head and part of the hat (crown, ribbon) separately, and similarly the ruff and buttons on the clothes. The object's maximum height is 16.2 cm, its maximum breadth 11.6 cm and its maximum depth 5.4 cm (*fig. 1*).

Fig. 2. Green and white, glazed stove tile with wallpaper pattern of rosettes.
Obr. 2. Zelenobíle glazovaný kachel s tapetovým vzorem růžic.

2.

Two fragments of square or rectangular stove tile, made of brick material, with a low chamber with a partition rib inside and heavily sooted, terminating in a thickened rim. The front side of the tile is glazed, decorated with a floral motif of a white rose with many leaves, and flower shoots on a green background. The fragments measure 14.5 x 11.5 cm and 9.2 x 5.5 cm, while the chamber is 7 cm deep (*fig. 2*).

3.

Fragment of a square or rectangular stove tile from a brick-coloured material with an admixture of mica, with a low chamber rounded in the corners and blackened inside, and rolled, strengthened rim. The front side is decorated with a stylised floral motif with shoots, flowers and fruits (or hop cones) in diagonal bands divided by sculpted geometric strips. Dimensions: 22.7 x 13.5cm, chamber depth 4.5 cm (*fig. 3*).

Fig. 3. Grey (micaceous) stove tile with the motif of a shoot and conelet or berry.
Obr. 3. Režný (slídovaný) kachel s motivem úponku a šištic či bobulí.

Fig. 4. Part of a grey (micaceous) stove tile.
Obr. 4. Zlomek režného (slídovaného) kachle.

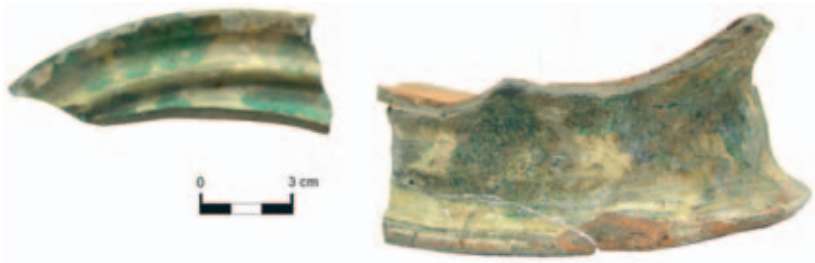


Fig. 5. Rim sherd and base of a vase-like vessel with an outer, yellow-green marbled glaze.
Obr. 5. Zlomky okraje a dna vázovité nádoby s vnější žlutozelenou mramorovanou glazurou.

4.

A small fragment from the corner of a chambered stove tile with blackened interior, made of an ochre-coloured material with a distinct mica application on the front side, the decorative ornament of which cannot be ascertained. This may be the architectural background to a portrait (column, arcade). Dimensions: 13.2 x 4.2 cm (*fig.4*).

5.

Two sherds from the rim and base of a vase-like vessel, made of a brick-coloured material with an outer opalescent glaze with yellow and green smears or marbling. Broad, flared rim in the shape of a cornice-like and not overly large ring, strongly truncated inner; the base comprises a low, hollow foot with traces of appliqué on the bottom part of the vessel. Dimensions: edge diameter 28 cm, average foot base 19 cm (*fig. 5*).

Local topography and findspot

Velké Němčice lies approximately 17 km south of Brno, not far from Židlochovice, at the north-western edge of Břeclav district. As early as 1220, when it is first mentioned, it belonged to the Cistercian Abbey of Velehrad, but was continually mortgaged because of its distance from the centre of the monastic domains. As a result, those managing the area in 1434-1496 were the lords of Tvorkov, later to be followed by the Pernštejns. In 1550, "the empty manor and township of Velké Němčice" was sold to Zikmund Heldt of Kement by the abbey at Velehrad. The new owner began to rebuild the manor as his own seat ("with walls of stone around, with towers, a gate, a drawbridge and a gate-house, such that it was regarded as a gem of the Moravian Land"), and in 1562 he requested that it be proclaimed a castle and chČteau, and that Velké Němčice be similarly proclaimed a town with a red seal. The monarch, Ferdinand I, promised that this would be done, however under the condition that ramparts and a ditch be built around the town, but this never occurred. In 1578 Heldt's widow assigned Velké Němčice to Tas Meziříčský of Lomnice. In 1618 the properties here fell

to the Thurn family, from whom they were confiscated after the Battle of White Mountain. A succession of owners followed, until in 1774 the holdings became a separate estate within the Židlochovice domain (*Nekuda 1970*, 644-645).

It is interesting that during the 15th and 16th centuries, the settlement was, in terms of religious orientation, mostly Utraquist, later becoming Protestant, and was also home to a sizeable community of Anabaptists (*Nekuda 1970*, 646), famous for their pottery skills.

Fig. 6. Stove at Vrchlabí Château (after *Brych 2004*).
Obr. 6. Kamna ze zámku ve Vrchlabí (podle *Brych 2004*).

Manufacturing technology and analysis of the sculpture

There is no doubt that the most notable piece in the assemblage is the relief sculpture on an almost flat base. It is necessary to state at the very start of the analysis that thus far it has not been possible to find any analogy to this item in archaeological sources thus far. It was necessary to consult with experts in related fields, in particular art history and ethnography, to processed further. An effort will be made to determine the use and function of the object, to consider the motif employed (whoever the sculpture represents), and on the basis of this, to date it more precisely.

From the clearly brick-based, lightly grogged and only slightly sintered, unglazed ceramic mass, it seems that the sculpture was made rather as construction or artistic pottery. The technology employed is certainly interesting: this is best visible on the reverse. The base, on which there are traces of a potter's wheel or the removal from such, has been cut out, cleaned with a knife, and probably a hand-shaped sculpture, perhaps even from several pieces (body, head and hat separately), was stuck into the cut-out parts. The decorative details, such as the buttons on the doublet, were also added subsequently.

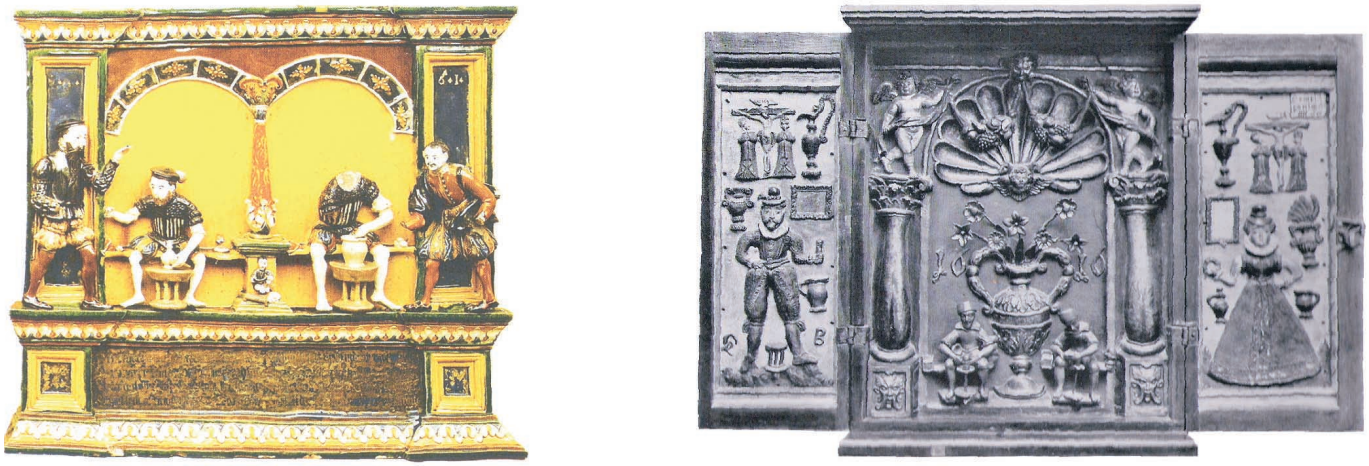
The assemblage contains pieces of a large, brick-coloured vessel with a broad mouth and outer glaze (but not glazed within, as would have been done for practical reasons to make kitchenware impermeable), and which may be regarded as a garden vase, dish or terrine. Equally, the sculpture considered here might have come from the bulge or edge of a similar vessel or jardinière (e. g. from beneath the handles on the shoulders, beneath the neck etc.). There is, of course, no pictorial or three-dimensional evidence available to support this conjecture, nor yet much to substantiate it.

The Renaissance was, naturally, a period in which many gardens were established, and in which garden architecture and elements thereof flourished, and consideration of the functional use of some of the pieces reviewed here is therefore not without justification.

Another explanation, which given its high degree of likelihood has come to be part even of the title of this contribution, places the sculpture among the stove-maker's wares. The use of ancillary tiles with usage blackening within the chamber is beyond question. The range of decorative elements in Renaissance stoves in particular is, however, very broad. There has been

Fig. 7. Two stoves from Salzburg (after *Franz 1981*).
Obr. 7. Dvoje kamna ze Salzburgu (podle *Franz 1981*).

consideration of apex stove tiles, the "acroteria" (as for example on a 1545 stove from Vrchlabí – *fig. 6*; *Brych 2004*, 24: fig. 15), and of corner tiles, which over time became more sculpted. For this hypothesis there is comparative material of a sort: in Austria, for example, several stoves survive with conspicuous and perfectly sculpted corner tiles, e. g. a pair from Salzburg (*fig. 7*; *Franz 1981*, 44: fig. 1; 186: fig. 23).



a **b**

Fig. 8. a) potters' guild emblem from Salzburg (after *Franz 1981*); b) tripartite potters' guild emblem from Styria (after *Strauss 1940*).
Obr. 8. a) cechovní znamení hrnčířů ze Salzburgu (podle *Franz 1981*); b) trojdílné cechovní znamení hrnčířů ze Štýrska (podle *Strauss 1940*).

In drawing the analogies together, another interesting possible interpretation was discovered, in the form of the ceramic guild emblems (*Zunftzeichen*) of the potters of Salzburg and Styria (*fig. 8*). In her extensive work on stove tiles from Austria in particular, *R. Franz* (*1981*, 112: fig. 11b) mentions an emblem of the Salzburg potters divided into three parts. Two almost comic figures with lively expressions and gestures spring from the sides of the relief, while in the middle two apprentices are featured at potters' wheels beneath a pair of Renaissance arcades. The artistic execution in high relief, with the heads

Fig. 9. Coloured, glazed stove tile bearing the motif of a clown, from Esztergom, made in Buda (after *Voit-Holl 1963*).
Obr. 9. Barevný glazovaný kachel s motivem šaška z Ostřihomi, vyrobeno v Budě (podle *Voit-Holl 1963*).

almost extending beyond the flat background, is not dissimilar to the subject fragment here. In an earlier monograph, *K. Strauss* (*1940*, 77: Taf. LI) provides an illustration of a tripartite (closing) guild sign from Styria. In addition to two similar figures of apprentices at a potters' wheel, the centre contains the decorative motifs of vases and shells with angels. At the wings a gentleman and lady in rich period costume are depicted along with the symbols of the craft, the male clothing being very similar to that on the sculpture. Moreover, in both cases the central panel includes a date, meaning that these guild emblems can be dated precisely to 1561 and 1616 respectively. Details of period fashion as an aid for dating will be considered below.

In terms of the theme depicted, there is no alternative but to review the iconographic sources for the 16th and 17th centuries. The dress and accessories of this period are well traced. Motifs of musicians, jugglers, actors or carnival masks can be found in the German milieu in particular. They were often present in "high" art as well, evidence for which comes for example from the pictures with folk or village themes by Bruegel (pig slaughtering, symbolic of German proverbs) and pieces from the "genre painting" workshops of Dutch and German masters like L. van Leyden (in the painting of the ‚Dance of Mary Magdalene', the drummer's costume – *Kein Tag 2002*, 51-52). These sources provide suitable comparative material not only for period fashions (as in this case) but also for the equipment of the home and kitchen, for agricultural labour etc.

In this country, and in particular in the South Moravian border regions (to which Velké Němčice belongs), the clown motif is no iconographic stranger even in earlier times; it appears, for example, on Late Gothic tiles from Blučina (see *Kalinová 1991*, 6-7). Here of course it is the motif, unknown in the Bohemian milieu, of the much-feared fool – a monster that devoured country dwellers, stemming perhaps from pagan Germanic legends or tales, and very different from the good-natured or clever and just fool of the Bohemian sphere (Brother John Thumb, Rye the magician, or even the German Eulenspiegel). The figure of the fool or jester is, however, shown differently in the medieval and later depictions of the 16th century, in a tight-fitting hood with the ears of a hare or ass, sometimes with small bells on his costume. It is in this guise that he appears on the long, rectangular tiles from Esztergom Château, which however comes from a pottery workshop in Buda and dates back to 1490 (*fig. 9*; *Voit-Holl 1963*, fig. 22). Also from the 15th century are the green glazed tiles from Kláštorisko (*Stredoveké kachlice 1993*, fig. 36), that show two figures at a mortar, one of which is again dressed in a clown's cap with animal ears. Among the multi-coloured, glazed pieces from the extensive collection of the Cologne City Museum, that show individual figures beneath arcade arches (*Strauss 1972*, 83, Taf. 128: 1, 2; *Unger 1988*,

Fig. 10. Renaissance stove tile bearing the motif of a clown beneath an arcade, from the Cologne City Museum (after *Strauss 1972*).
Obr. 10. Renesanční kachel s motivem šaška pod arkádou z Městského muzea v Kolíně nad Rýnem (podle *Strauss 1972*).

136-137, Kat. Nr. 93), there is a typical Renaissance tile depicting a dancing fool, dressed only in his clown's hood (which falls to the shoulder), and with bells on his hare's ears (*fig. 10*). Other similar analogies from the German milieu are to be found in the work of *R. Franz* (*1969*, 257, 292).

Consideration of the depicted motif also needs to encompass the idea of a character from the originally Italian *commedia dell'arte*, Harlequin or the Captain, as illustrated for instance by S. Lancret (*fig. 11*; *Jůzl et al. 1989*, 328: fig. 85). This comedy had its roots in 16th century Italy, from whence it permeated into France, where it became attached to French theatre at the court of Louis XIV, ultimately becoming part of Rococo courtly entertainment even here, as indicated by an 18th century fresco from Český Krumlov château (*Jůzl et al. 1989*, 329).

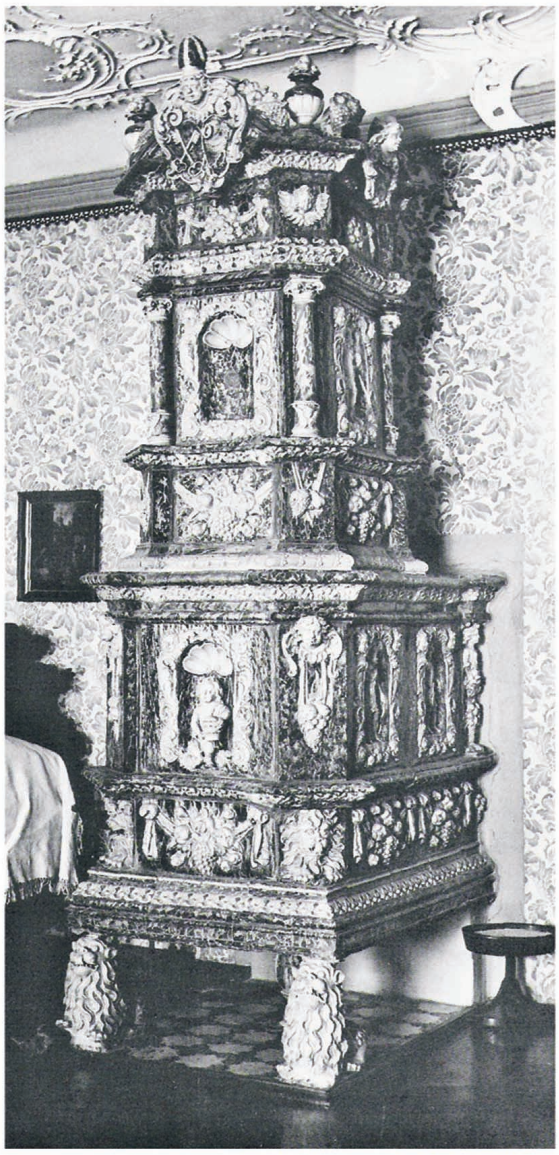
The milieu of Velké Němčice in South Moravia may seem far too regional or provincial for this latter explanation. By the 16th and 17th century, however, rural folklore, customs and habits had their place in vernacular culture, which traditionally included masked processions and dances, from which amusing and ugly figures were not omitted, often with scowling or animal-like features or grimacing expressions. In the German sphere in particular, pre-Lenten carnivals with masked processions, clowns and fools (*Faschingsumzüge*) have a long tradition, and essentially survive down to the present.

The Mannerist or Late Renaissance period admired picturesqueness, which was expressed in painting, sculpture and architecture (e. g. in the shapes of glaring mascarons, gargoyles, fountains and other architectural elements) as well perhaps as through the simplified, naēve forms that appeared in stove tile moulds. Cornice tiles of the early 16th century from Křešice u Divišova, for example, now in the National Museum (*fig. 12*; *Brych 2004*, 126: cat. nos. 281, 282), show the half-length figure of a common miner, again with a not especially prepossessing face and primitive expression, with no deliberate favour.

It should also be recalled that after the great discoveries overseas at the end of the 15th and in the early 16th centuries, Europeans were encountering other races in the flesh, so that their interest in the exotic might have been expressed through attempts at mimicking depictions of, for example, Negroid features. Surprisingly, such an attempt is not overly apparent in the surviving stove from

Fig. 11. Depiction of one of the Commedia dell'arte figures, Harlequin or the Captain, by S. Lancret (after *Jůzl et al.1989*).
Obr. 11. Vyobrazení postav Commedie dell'arte, harlekýna nebo kapitána, autor S. Lancret (podle *Jůzl a kol. 1989*).

Fig. 12. Cornice stove tile with crenellations and the half-length figure of a miner, from Křešice u Divišova (after *Brych 2004*).
Obr. 12. Římsový kachel s cimbuřím s polopostavou horníka z Křešic u Divišova (podle *Brych 2004*).



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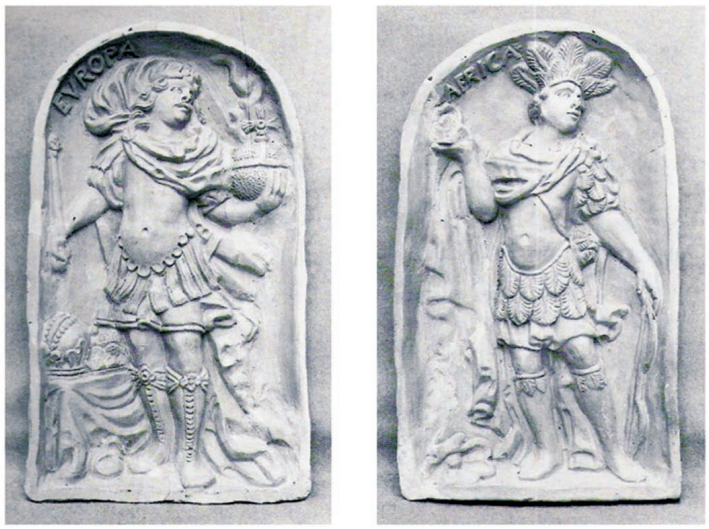

b

Fig. 13. a) stove from Kufstein Château depicting the Continents on the tiles, dating to 1686/87 (after *Franz 1981*);
b) tiles with personifications of Europe and Africa (after *Franz 1981*).
Obr. 13. a) kamna ze zámku Kufstein se znázorněním světadílů na kachlích, r. 1686/87 (podle *Franz 1981*);
b) kachle s personifikovaným zpodobněním Evropy a Afriky (podle *Franz 1981*).

Kufstein Château (*fig. 13a*; *Franz 1981*, 447), the maker of which – Michael Pogner – and date of production (1686/1687) are known. This stove has male figures representing the continents then known (and recognised) – Europe, Asia and Africa (*fig. 13b*; *Franz 1981*, fig. 447). In terms of quality and the level of execution, however, these true artworks cannot be compared to the primitive sculpture under consideration here.

An attempt will now be made to consider the item in its period context and to date the sculpture and the whole assemblage more precisely. At this point, it is necessary to rely on an analysis and the characteristics of the period costume depicted.

The hat with a conical crown and straight brim, is a typical accessory to noble clothing of the 16th (*Kybalová 1996*, 67-68) and even the first half of the 17th century, when perhaps it became somewhat more common, as it is shown, with even the stiff ruff and conspicuous buttons on the doublet, as an example of regular German clothing in Hollar's 1646 engraving of "The Jealous Soldier" (*fig. 14*; *Kybalová 1997*, 39; *Racinet 2003*, 416: fig. 336). Among the lower classes there was evidently often a mixing (and extended survival) of the elements of various items of national fashion; the aforementioned hat, for example, was intended as an accessory in particular to French fashions (*Kybalová 1997*, 88), while the ruff was a typical element of Spanish dress (*Kybalová 1996*, 106-107). The goose-bellied or peascod doublet is shown as an element of military attire as well, in the form of a puffed out, stuffed or reinforced doublet, often with a row of buttons down the middle, generally complemented by a ruff and various types of hats with conical crowns and broader or narrower brims – dating back to the reign

Fig. 14. German male dress of the 16th century, on Hollar's engraving "The Jealous Soldier" (on the left; after *Racinet 2003*).
Obr. 14. Německý mužský oděv v 16. století na rytině V. Hollara „Žárlivý vojín" (vlevo; podle *Racinet 2003*)

Fig. 15. Men's fashion at the beginning of the 17th century (under the reign of French king Henry III) in Flanders, with a goose-bellied or peascod doublet (after *Racinet 2003*).
Obr. 15. Mužská móda počátku 17. století (za vlády francouzského krále Jindřicha III.) ve Flandrech s kabátcem ve střihu tzv. husího břichu (podle *Racinet 2003*).

Fig. 16. Tile from a stove at Salzburg depicting a hunter with dog, beginning of the 17th century (after *Franz 1981*).
Obr. 16. Kachel z kamen v Salzburgu s vyobrazením myslivce se psem, poč. 17. století (podle *Franz 1981*).

of Henry III, i. e. the first decade of the 17th century, in France and Flanders (*fig. 15*; *Racinet 2003*, 340: fig. 275). It is interesting that various 'higher class' soldiers – musketeers, arquebusiers, jaegers or recruiting sergeants – became the themes for stove tile moulds, evidence for which comes from the tile fragments (and painted faience tiles) in the old collections of the National Museum, dated to the second half of the 16th to the second half of the 17th centuries (*Brych 2004*, 194-196: cat. nos. 498-504). Apparently it was the brightness and picturesqueness of their dress that attracted the tile makers. Stoves from Salzburg with the motif of hunters in similar clothes with dogs (*fig. 16*; *Franz 1981*, fig. 654) have been dated to the beginning of the 17th century, while from the second half of the 16th century (c. 1570) there are stoves with alternating clowns, recruiters and soldiers (*fig. 17*; *Franz 1981*, figs. 257-259).

Even before the finds were accepted into the collection, Dr. Vladimír Nekuda had described them as "Renaissance tiles from the turn of the 17th century". This was evidently supported by the topography of the site, as he states that "on the site stood a granary (and manor?)", this being further detailed in his overview of castles and fortified manors in Moravia (*Nekuda-Unger 1981*, 309). The manor itself is stated in 1550 to have been deserted, but shortly thereafter a small Renaissance château was built on the site, a relict of which is the Renaissance portal bearing the coat-of-arms of Tas Meziříčský of Lomnice, from the second half of the 16th century. This latest analysis permits us only to loosen the estimated date somewhat, and be satisfied with a classification to the late 16th or first half of the 17th century.

Fig. 17. Stove tile with recruiter and a model of a tile with a soldier from the Rhineland, c.1570 (after *Franz 1981*).
Obr. 17. Kachel s verbířem a model kachle s vojákem z kamen v Porýní, kol r. 1570 (podle *Franz 1981*).

Analysis of the accompanying tiles

The chambers of all pieces are soot blackened, and the tiles were therefore functional. In the case of the grey tile with the fine, micaceous admixture in the mass and the more conspicuously mica-coated front side decorated with a diagonally oriented floral motif of shoots and conelets (*fig. 3*), the chamber depth is very small (only 4.5 cm) and is far from attaining the depth of the chambers of earlier, Gothic tiles, this being one of the indicators of modern period tiles (*Hoššo 2004*, 575). Also the mould had evidently been used a great deal, and was this markedly worn, as the relief is low and less conspicuous.

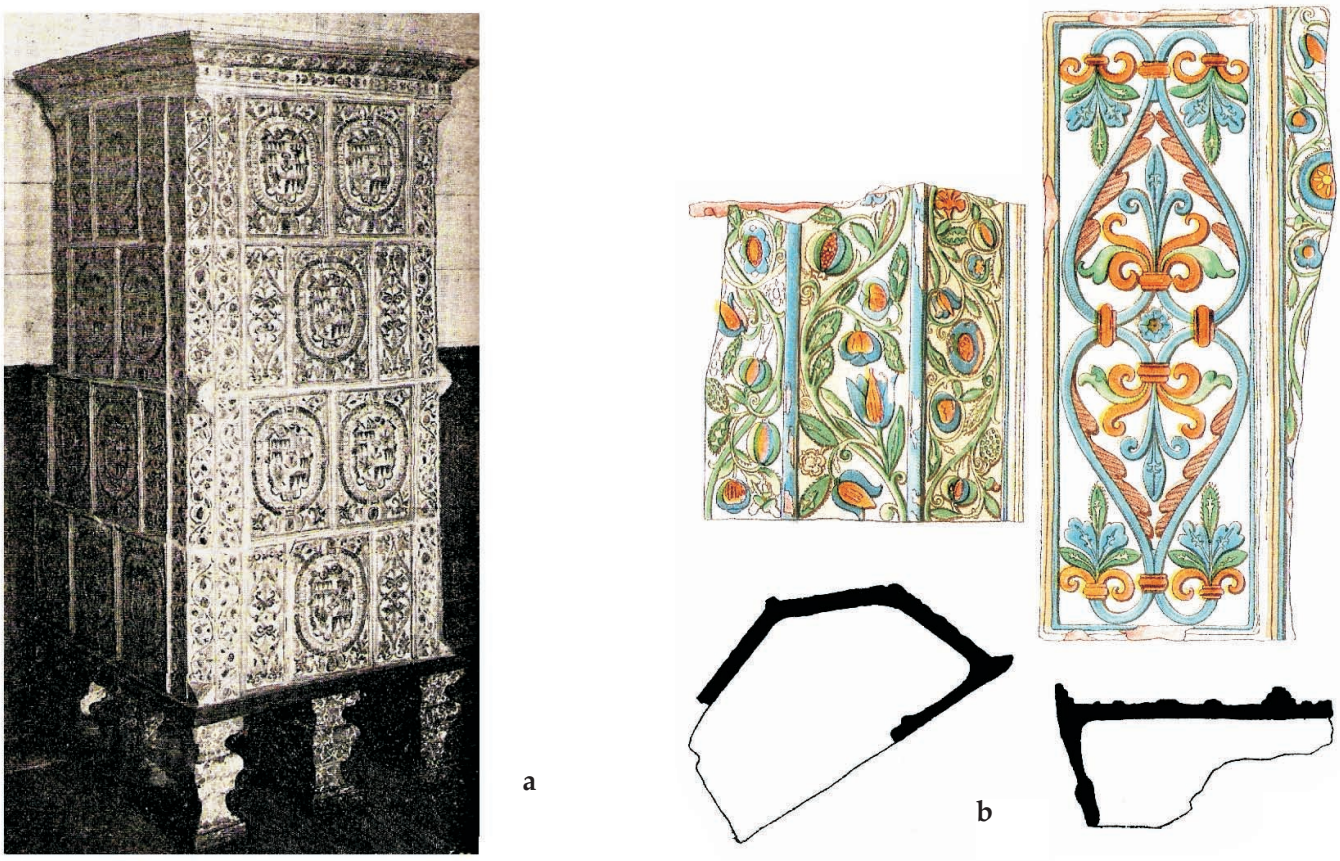

Fig. 18. Stoves (a) and their corner tiles (b) from Chropyně Château. After *Franz 1903* (a) and from the photographic archive of the National Monuments Office, Brno (b).
Obr. 18. Kamna (a) a jejich rohové kachle (b) ze zámku v Chropyni. Podle *Franz 1903* (a) a fotoarchiv Národního památkového ústavu Brno (b).

A distant analogy of wavy tendrils with cones in a glazed and coloured form can perhaps be seen in a stove still standing today at the Renaissance château of Chropyně near Kroměříž (*fig. 18*), where the stove corners are shaped out of vertical tile fillets with this motif. The stove is built out of rectangular, heraldic tiles with the archiepiscopal coat-of-arms of Karel of Lichtenštejn, and the year 1668 (*Franz 1903*, 175: fig. 43). The Chropyně tile with tendril is also kept in the National Museum collections in Prague (*Brych 2004*, 209, cat. no. 559), which was obtained as a "gift from the archiepiscopal administrator of the Chropyně Château". Here the floral ornament is of course far richer, complemented by pomegranates and flowers, the origins of which may be found in the Turkish milieu, and which became popular in Moravia and then for a long period appeared on folk ceramics and embroideries. Thanks to this, the motif is very common on stove tiles, especially cornice tiles with crenellations and inscriptions or names, where the wavy tendrils are weighed down by hop cones, berries or small bunches or grapes. The copious comparative material

Fig. 19. Cornice tile with crenellations and the motif of a shoot with berries or a bunch of grapes, from the old collections of the Moravian Museum in Brno, originally held by the Kunštát Museum. *Photo: S. Doleželová.*
Obr. 19. Římsové kachle s cimbuřím a motivem úponku s bobulemi či hrozny ze staré sbírky Moravského zemského muzea v Brně, původně z Vlastivědného muzea v Kunštátu. *Foto S. Doleželová.*

contains a wide array of variations. Conelets are termed raspberry fruits on the tiles from Opočno, now in the Čelákovice Museum (*Skružný – Špaček 2004*, 252). Most often, however, the fruit depicted is described as grapes (e. g. *Žegklitz 1987*, 655-671). Two pieces are known from Kutná Hora (*Gotické a renesanční kachle 2002*, K1-95, K-245), dated approximately to the 16th century.

The regionally closest find, again of a cornice, grey and mica coated tile, comes from Kralice (and is currently part of the 'Kralice Bible Memorial' exhibition). A further two, complete finds are kept in the 'old collections' of the Archaeological Institute of the Moravian Museum (the collections of the former Kunštát Local History Museum, nos. 157, 158 – *fig. 19*).

An entire set of similar tiles (some even with a green glaze) is to be found in the tile collections of the National Museum in Prague and stems from Prague, with only a few exceptions (from Opatovice and Křešice u Divišova; *Brych 2004*, 130-134).

Slovakia is represented in this sense by Rimavská Sobota (*Stredoveké kachlice 1993*, fig. 30).

The Prague finds and the Slovak piece have been dated to the 15th century. A date of 1557 has been assigned to the bell (!) of Urban of Košice, the perimeter fillet of which has a band of decoration showing grape pickers and lines of vine tendrils and fruit (*Spiritza 2001*, 54-55).

However, no direct analogy of a square tile with a flat front side and diagonal, sculpted fillets lined by tendril and conelet motifs, is yet known. It seems, however, that the simplification or inconspicuousness of the ornament implies a certain degeneration, and perhaps is a sign of later development and declining popularity of the motif.

The green and white "wallpaper" pattern of the glazed tile (*fig. 2*) is similar to Austrian tiles from the late Renaissance stoves at Poppendorf Castle in Styria (*fig. 20*), from Graz and from Funedsberg Castle, which have been dated to the turn of the 17th century (*Franz 1981*, 98: Taf. 6; *Hazlbauer 2003*, 160: figs. 16-18). These tiles do not bear the whole motif, but the corner quarters of white rosettes formed wholes when the tiles were set together – a broad wallpaper. In this case, too, the relief is not overly high and the front side of the tile is intended to serve as a compact surface, which is r tile (in both motif and combination of colours) is known from the Špilberk

Fig. 20. Green and white wallpaper pattern on a late Renaissance stove from Poppendorf Castle (after *Franz 1981*).
Obr. 20. Zelenobílý tapetový vzor na pozdně renesančních kamnech ze zámku Poppendorf (podle *Franz 1981*).

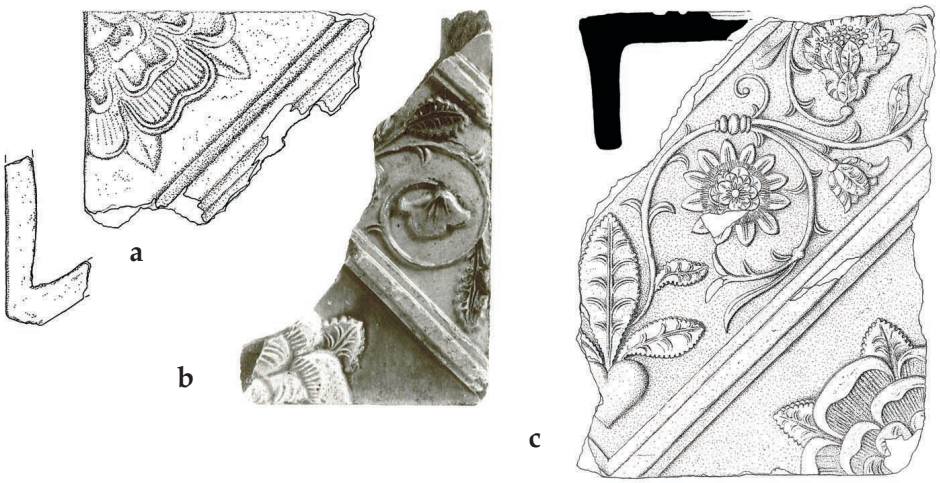

Fig. 21. Analogies from Brno for the tile with a green and white glazed rosette pattern:
a) Špilberk – courtyard;
b) Starobrněnská Street no. 7;
c) Veselá – car park.
All illustrations from the Brno City Museum.
Obr. 21. Brněnské analogie ke kachlím se zelenobíle glazovaným růžicovým vzorem.
a) Špilberk – nádvoří;
b) Starobrněnská 7;
c) Veselá – parkoviště.
Kresba a foto archiv Muzea města Brna.

courtyard area (*fig. 21a*, now in the Brno City Museum, inv. no. 327753), while further analogies from the city, a tile with a wallpaper rose motif, have been recovered from Starobrněnská Street no. 7 (*fig. 21b*, deposited in the Brno City Museum, inv. no. 6433) and the Veselá-car park site (*fig. 21c*, deposited in the Brno City Museum, inv. no. 377869, 861). In terms of dating, the chronology of these wallpaper tiles and tiles with conelets and shoots falls within the already delimited period stretching from the end of the 16th to the mid-17th century.

Conclusion

In summary, it is not possible to conclude otherwise than did Dr, Nekuda, that this is probably a collection of Renaissance age, dating roughly to the end of the 16th or first half of the 17th century. The use and purpose of the most conspicuous piece, the fragment of a figurative sculpture, are not entirely clear. It might be part of an emblem of the potters' guild, or a corner or apex tile from a Dutch stove. There is at least some support for these assertions in the iconography and literature. It is less likely that these pieces might have been used in garden architecture, for which there are no analogies whatsoever. It was no simple matter to find anything comparable to the motif employed. The sculpture gives the impression of being a caricature of an unattractive man, probably an old soldier or recruiting sergeant, in fashionable period dress.

Resumé:

Zajímavý „objev" přinesla kontrola starého sbírkového fondu pracoviště historické archeologie Moravského zemského muzea v Brně, která proběhla po přestěhování a několikerém třídění těchto sbírek. V únoru r. 1976 přinesl pan František Pich vedoucímu tohoto oddělení dr. Vladimíru Nekudovi nevelký soubor keramických nálezů, jež zachránil z hloubky tří metrů při kopání základů pro stavbu pohostinství a kina ve Velkých Němčicích u Židlochovic (okr. Břeclav) a po jejich rámcovém určení je muzeu daroval. Přes svou nepočetnost se zdá být celek hodnotný svým charakterem.

Jedná se totiž o několik zlomků polévaných i nepolévaných kamnových kachlů renesančního stáří. V souboru na první pohled upoutá výrazně reliéfní plastika muže v dobovém oděvu vystupující z ploché podkladové desky cihlové barvy.

Hned v úvodu rozboru je třeba konstatovat, že se k tomuto předmětu v archeologickém materiálu dosud nepodařilo najít žádné blízké analogie.

Pokusíme se na předmět podívat z několika hledisek: budeme pátrat po jeho účelu a funkci, zaměříme se na znázorněný motiv, co či koho vlastně plastika měla představovat a pokusíme se na základě toho všeho upřesnit či posunout datování předmětu.

Po konzultacích s odborníky z příbuzných oborů, zejména umělecké historie a etnografie, a po hlubším heuristickém pátrání se zdá, že půjde o celek zhruba z konce 16. až první poloviny 17. století. Účel a funkce nejvýraznějšího kusu – fragmentu figurální plastiky – nejsou zcela jednoznačné. Mohlo jít o zlomek cechovního znaku hrnčířů či rohový nebo vrcholový kamnový kachel. Pro tato tvrzení máme jakési opory v ikonografii a literatuře. Nejméně pravděpodobná se jeví možnost využití v zahradní architektuře, k čemuž nemáme analogie žádné. Zobrazený motiv nebylo jednoduché objasnit. Plastika vyvolává dojem karikatury nevzhledného chlapíka, snad starého vojáka či verbíře, v módním dobovém oděvu.

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Finds of clay tobacco pipes from Náměstí Republiky in Prague's New Town

Nálezy keramických dýmek z náměstí Republiky na Novém Městě v Praze

Funde von Keramikpfeifen vom náměstí Republiky-Platz in der Prager Neustadt

Martin Vyšohlíd

Der Text dieses Beitrags befasst sich mit den Funden von Keramikpfeifen aus einer großangelegten Grabung in der Prager Neustadt. Die Fragmente von Pfeifen gehören dem jüngsten Fundhorizont auf der Grabungsfläche an (17.-20. Jahrhundert). Zu Anfang des 2. Drittels des 17. Jahrhunderts wurde auf der Grabungsfläche ein Kapuzinerkloster gegründet, das bis zum Ende des 18. Jahrhunderts bestand. Nach seiner Schließung wurden die Klostergebäude bis in die Mitte des 19. Jahrhunderts von der Armee genutzt. Der Beitrag widmet sich eingehend vor allem den ältesten Funden, d. h. den Keramikpfeifen des sog. holländischen (englischen) Typs im Verlauf des 17. und 18. Jahrhunderts, von denen insgesamt 263 Stück (Fragmente von Pfeifenköpfen und Stiele) gefunden worden sind.

Introduction

The main fieldwork for the lead archaeological excavation on the site of the former George of Poděbrady barracks on Náměstí Republiky (Republic Square) in Prague's New Town took place in 2003-2005[1)] *(fig. 1)*. This was the largest surface exposure of the city's historical core in the history of Czech archaeology and brought a huge quantity of archaeological finds from an area of almost 1.5 ha (*Dragoun et al.*, in print). One of the types of finds, until now neglected in Czech archaeology, were clay and porcelain tobacco pipes, which were part of the most recent level of archaeological situations in the excavated area.

Fig. 1. Map of the centre of Prague with the location marked.
Obr. 1. Mapa centra Prahy s vyznačenou lokalitou.

This article will deal in depth with these finds, fragments of spur and heelless clay tobacco pipes (their bowls and stems) that come from the Western European tradition and are sometimes called English or Dutch pipes *(figs. 2, 20)*. In our finds these represent the oldest layer of this type of artefact, i. e. from the 17th and 18th centuries.

In the first part of this article I will examine some basic information about this type of pipe, in particular the question of the production process, matters related to European production and pipe dating, as well as records of written sources about tobacco and pipes in Bohemia. Practically no attention has ever been paid to this topic in Czech archaeology, so I believe that these few introductory chapters will be a benefit.

The second part of this article will examine the location itself and analyse the finds unearthed there.

Note 1:
The actual whole-surface archaeological research project was preceded by several test trenchings during the 1990s (*Juřina 1998*; *Ernée – Vařeka 2000*; *Dohnal – Vařeka 2002*; *Ernée – Kašák – Kováčik – Vařeka 2002*)

Fig. 2. Section of the picture "Still life with Smoking Requisites" by Jan Jansz. van de Veldes from the middle of the 17th century. Reproduced from *Garas 1985*.
Obr. 2. Výřez z obrazu „Zátiší s kuřáckými potřebami" Jana Jansz. van de Veldes z poloviny 17. století. Reprodukce z *Garas 1985*.

Technology and manufacturing process

To ensure good quality pipes, it was very important to select quality raw materials. The clay had to be properly processed – washed and cleaned of all impurities and small stones. After partial drying, the remaining air bubbles were removed from the clay, mostly by hitting it with an iron bar. The clay would then be divided into smaller bricks, from which material would be taken for individual pipes (*Ayto 1994*, 19-25). A „roll" – the rough shape of a pipe – was formed in the hand. A long brass rod was used to create the stem hole (the wire was left in the pipe). After drying for a short time, the pipe was placed in a two-piece mould (first wooden, then brass, and mostly iron after 1750). The inside of the mould was lightly coated with fat (oil), so that the pipe did not stick to it. After the semi-finished pipe was tightened in the mould, a hole in the bowl was created using stopper and a wire was then pushed into the stem, so the stem hole was connected to the bowl chamber. After the pipe was taken out of the mould, its surface was trimmed and decorated by rouletting or using stemp embossing. More advanced embossed decoration (e. g. plant motifs, ribbing, bowls in the form of figures, etc.), was part of the mould itself. After slow drying in a ventilated place the pipes were placed in saggars and fired by the several thousand in kilns at temperatures of 900-950°C. After cooling, a bowl's surface was smoothed or polished. The mouthpiece was waxed, so the smoker's lips did not stick to the pipe (*Acker 2003*; *Kügler 1987*, 32-49).

Matters related to European production and pipe dating

With the development of archaeologists' interest in this type of find in the past 20 years there has been a marked development of knowledge and opportunities for better interpretation and dating of individual pipe finds. First, in particular, in England (*Atkinson – Oswald 1972*; *Oswald 1975*), then in continental Europe, primarily in Holland, Germany and Poland, a quantity of findings based on archaeological and archival research started to be published (*Kluttig-Altmann 2002*; *Kluttig-Altmann – Kügler 2003*; *Kügler 1995*; *Mikłaszewicz 1995*). The basic morphological development of pipes was captured and more details were found to supplement knowledge about the specifics of production in the various centres; questions related to research in this area were also outlined (*Duco 1999*).

To put it simply, we can say that the smaller the bowl, the thicker the bowl walls and the stem diameter, the older the pipe. At the same time as the size (and therefore the capacity of a bowl chamber) increased and the walls got thinner, there were gradual developments in the shape of the bowl and changes to decorative motifs (*Dvořák 1982*). The whole then, together with an assessment of the quality of a pipe and any personal marks by the producers, provides an overall picture of the place of production and the time span over which a piece was made. If a specific pipe has an optimum predicative value, this gives us a very narrow time period in which the pipe could have been produced

and the specific pipe producer (*Ayto 1994*). Essentially, production in continental Europe can be divided into four basic groups: original products from Gouda, imitations (fakes) of Gouda products, regional products and products influenced by the styles of production centres in other countries (*Duco 1999*).

Dutch products, primarily from Gouda

Products from Dutch pipe-makers and, in particular, from the city of Gouda, are worth a somewhat more detailed discussion because Gouda was, from the middle of the 17th until the middle of the 18th century, the clear centre of pipe production whose products literally flooded the whole of contemporary Europe[2)] and, primarily, because they became the model and a target for copying by other producers in the rest of western and central Europe. In the Netherlands, the first written sources that mention tobacco smoking date from 1580. Pipe production started a relatively short time later; first of all there was regional production in which only individual producers were involved; after 1620 production was concentrated in manufactories and Amsterdam became the main centre of production.[3)] After Amsterdam (1607) and Leiden (1612), the third centre to appear was Gouda.[4)] Production was mostly started by pipe-makers from England, some of whom left the country after the anti-tobacco restrictions of James I (1603 – 1625). Pipes were first sold to the English who had settled in Holland due to their disagreement with their country's religious policy, but the smoking habit quickly spread to local people (*Duco 1987*).

Gouda gradually became Amsterdam's main competitor and after 1660, when the pipe-makers' guild was founded, it assumed the leading position, which was confirmed by the relocation of the main pipe product market to Gouda in 1686. A guild had to be established because of the frequent copying of the personal marks of producers whose products were of a high quality; guild lists of producers and their marks guaranteed stricter supervision and legal certainties during any dispute between competitors (*Duco 2003*). Products from Gouda are, primarily thanks to the wealth of written sources, by some distance the best mapped of all in continental Europe.

Bohemia and tobacco – written and archaeological sources

We can quite certainly link the oldest reports to the use of tobacco as a medicinal herb, grown in the gardens of pharmacists and monasteries. The first mention of tobacco in the Czech lands comes from a work of Adam Zalužanský of Zalužany, „Methodi Herbariae Libri Tres" from 1592, where the author states that „tobacco is already an ordinary herb". Another source is a list of the property of the druggist Šmid from 1608, who left 4 lots (one lot = 17.5 g) of „foliorum tabaci". A list of the property of the rich merchant Štork of Štorkenfeld from 1618 records 117.5 pounds (one pound = 514 g) of red „prysyll" (Brazilian tobacco) worth 32 threescores. This expensive, high-quality tobacco was probably for snuffing (*Čapek 1947*). Written sources for this period are supported by archaeobotany, in the form of a find near Prague Castle[5)], where a Nicotiana rustica seed was found in the infilling of a waste pit in Kanovnická Street (*Čulíková 1995*).

The spreading of the smoking habit is usually thought to be connected to the movement of west-European armies in the Czech lands during the Thirty

Note 2:
For example, in Poland finds of pipes from Holland (mostly from Gouda) from the period in question account for 88 % of all finds (*Zimmermann 1990*).

Note 3:
The largest and longest-operating production centres outside Gouda and Amsterdam include Alphen, Gorinchem, Groningen, Leeuwarden, Leiden, Schoonhoven, Utrecht and Zwolle. There were a total of 44 places where pipes were produced in Holland (*Duco 1987*, 12).

Note 4:
The first pipe-maker in Gouda that appears in written sources, dating from 1617, is the Englishman William Baernelts, who used the Dutch version of his name Willem Barends.

Note 5:
In 1982-85 archaeological excavation was done on the premises of St. Anthony's Hospital in Kanovnická Street and included the excavation of a waste pit, from which the finds came. The hospital was re-founded in 1547 and operated until 1733; the infilling in question was dated to the end of the 16th century/beginning of the 17th century (*Frolík – Žegklitz 1988*; *Frolík – Žegklitz – Boháčová 1988*).

Years' War. The first written mentions of pipes, as captured in Prague inventory books by the historian Zikmund Winter, are interesting: "The first pipes for tobacco are recorded in Prague inventory lists in 1622. And we found the first 'tabakpfeyfen', twenty-two pieces, recorded in the stock of the druggist Antonín Trendtin in the Old Town in 1656. Although the physicist could have sold his pipes a long time before this year. He died in 1656." (*Winter 1915*, 315.)

Other records show the very widespread habit of using tobacco in the Czech lands. The Moravian Regional Diet in Brno prohibited tobacco smoking in 1652. The Bohemian Diet sitting in 1657-1658 prohibited smoking tobacco „for danger of fire", but allowed snuffing. This ban quite certainly did not have a major impact and in 1664 a decision was taken that tobacco would be a welcome source of income for the regional treasury. The increase in interest by the authorities here went hand in hand with the development of local tobacco growing. The oldest mentions date from 1659-1660 from two requests by a captain Theobaldt, who wanted the privilege of selling tobacco in Bohemia and proclaimed his willingness to buy the whole domestic harvest.[6)] Other records from the 1670s talk about tobacco growing in specific regions. The rapid spread of the new plant is shown by an estimate of the revenues on tobacco leaves made by Prague merchants (who had the sole right to purchase it) in 1677, when the quantity was a whole 5,000 centners (centner = 61.73 kg), which was undoubtedly a quantity exceeding domestic consumption. Tobacco growing went through several stages of rises and falls, until it was prohibited in Bohemia in 1806.

Note 6:
The first request states that the right being requested *„wir auch denen, so allhierlandes den Tabac sähmen oder pflanzen, kein Schaden bringen, weilen er solchen mit barem Gelde zu bezahlen sich anerboten"*. The second again mentions tobacco: *„der im Landt selbsten gebauen wird"*.

Documentary evidence of pipe products for the 17th century is unfortunately missing at present in Czech written and archaeological sources, but there can be no doubt that local potters will at least have produced some attempts and we can hope that future archaeological research will bear positive results.

A brief history of the location

To assess the pipes found during the archaeological research on Náměstí Republiky is important to examine the use of the area in question from the beginning of the 17th century until the 20th century. The period in question includes the establishment and existence of a Capuchin monastery, and the subsequent use of its buildings by the army, as well as the construction of new barracks after their destruction.

The foundation of a Capuchin monastery in the 1630s led to a very radical change to the whole area of the land on which the archaeological research was conducted. The actual monastery and Church of Saint Joseph (still standing) were built in the south-western and western part of the area[7)] *(fig. 3)*, on the site of an old Gothic hospital and later Renaissance house development, which formed the street line leading towards Naměstí Republiky. The older houses were gradually torn down on Na poříčí and Truhlářská Streets and the layers of building rubble were covered with the clayey substrate of the new monastery garden.

Note 7:
The monastery was founded in 1630 at the instigation from Ferdinand II (1619-1637). The main donor was Gerard von Questenberg, brother of the Abbot of Strahov, Kaspar von Questenberg. The foundation stone of the new church was laid on 13th May 1636. The monastery was inhabited by friars from 1642. The dissolution of the monastery was announced in 1786 (*Vlček – Sommer – Foltýn 1997*).

After the dissolution of the monastery by Emperor Josef II (1780-1790), the army started to use the monastery building from 1794. In the 1840s a stable for military horses was built in the former monastery garden (building H). After the old monastery buildings were demolished, the construction of the main buildings of Joseph's barracks, which now forms the façade facing Náměstí Republiky was completed in 1861.

Fig. 3. View of excavated area from the south in the 2004 summer season. Marked areas: A (section with largest concentration of finds of spur and heelless pipes and stems), B (cellars of monastery buildings), C (central monastery pit). *Photo by J. Šilpoch.*
Obr. 3. Pohled na plochu výzkumu od jihu v průběhu letní sezóny roku 2004. Vyznačené plochy A (úsek s největší koncentrací nálezů jednodílných dýmek a troubelí), B (sklepy budov kláštera), C (centrální klášterní jímka). *Foto J. Šilpoch.*

Field context

The actual finds of pipe fragments were relatively evenly distributed throughout the area of the research, with two exceptions. The first of them was the northeast part of the area researched in a section examined by workers from the National Institute of the Care of Monuments – the territorial specialized department in Prague, and, partially, a team from Archaia Brno (*fig. 3*, area A). Thanks to the gravel-sand subsoil of the Vltava terrace that falls away to the north, the clayey monastery garden level on the destroyed older buildings reached the greatest thickness here. It was here (and, in exceptional cases, also under this location) that the largest quantity of fragments of stems and bowls of clay tobacco pipes of the so-called Dutch (English) type were preserved. The second exception was the space where the monastery buildings were (the southwest and west part of the area). Here there were concentrations of more recent pipes from the end of the 18th century and 19th century, primarily in backfills in cellars, infilling of waste pits and deposits in brick drains (*fig. 3*, areas B and C).

A total of 668 pipe pieces were found. The graphs (*fig. 4*) show the percentages of fragments by type of pipe and by the material from which they were made. The pipes that this article deals with consist of 32 bowl fragments and 231 stem fragments, of which only 64 fragments were placed in the catalogue (decorated, glazed, bent fragments and mouthpieces).

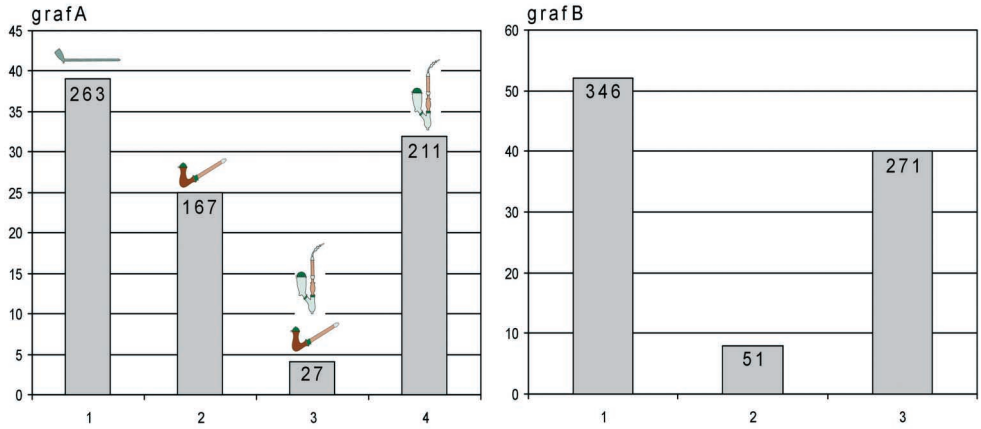

Fig. 4. Graphs showing the percentage distribution of pipe finds (with numbers of units).
Graph A: Breakdown of pipes by type (1 – spur and heelless pipes including stems, 2 – stub-stemmed pipes, 3 – stub-stemmed or three-piece pipes, 4 – three-piece porcelain pipes).
Graph B: Breakdown of pipes by material (1 – clay pipes, 2 – glazed clay pipes, 3 – porcelain pipes).
Obr. 4. Grafy znázorňující procentuální zastoupení nálezů dýmek (s počty kusů).
Graf A: Druhové zastoupení dýmek (1 – jednodílné dýmky včetně troubelí, 2 – dvoudílné dýmky, 3 – dvou nebo trojdílné dýmky, 4 – trojdílné dýmky).
Graf B: Materiálové zastoupení dýmek (1 – keramické dýmky, 2 – keramické dýmky glazované, 3 – porcelánové dýmky).

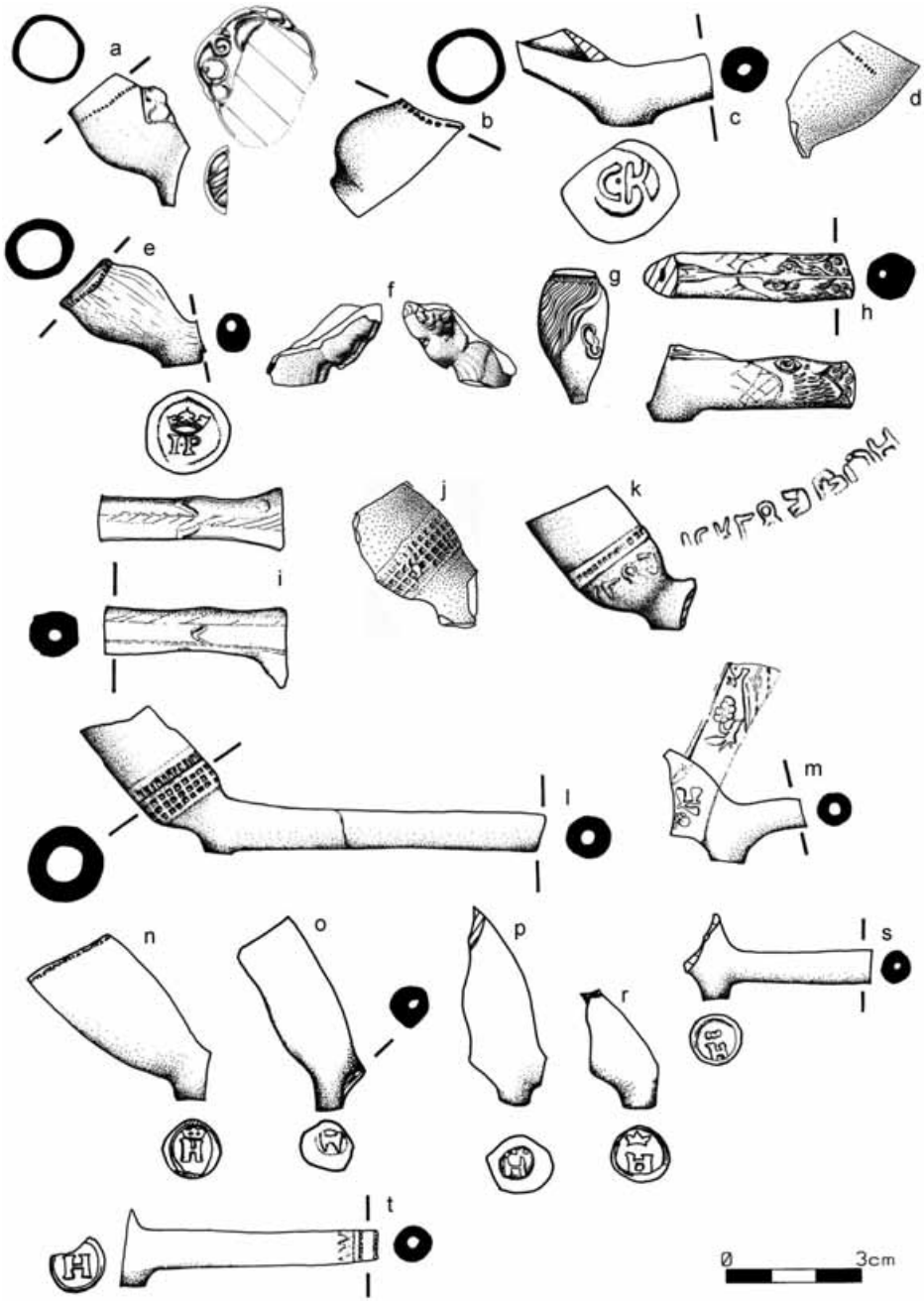

Fig. 5. a) X06-012; b) Y03-011; c) E21-001b; d) L20-002; e) D17-1270; f) K21-002a; g) ZA07-001; h) G15-3273c; i) U05-002; j) R22-005; k) Y04-006; l) Z06-015; m) Z05-012; n) N35-014a; o) E21-001b; p) Y31-048a; r) Z05-009; s) G16-110a; t) Z05-009b. Marks and details enlarged on a scale of 2:1, unless specified otherwise. *Drawings by L. Nohovcová, J. Votava.*
Obr. 5. a) X06-012; b) Y03-011; c) E21-001b; d) L20-002; e) D17-1270; f) K21-002a; g) ZA07-001; h) G15-3273c; i) U05-002; j) R22-005; k) Y04-006; l) Z06-015; m) Z05-012; n) N35-014a; o) E21-001b; p) Y31-048a; r) Z05-009; s) G16-110a; t) Z05-009b. Značky a detaily zvětšeny v měřítku 2:1, není-li uvedeno jinak. *Kresba L. Nohovcová, J. Votava.*

Earliest level of finds

The earliest pipes date from the first half of the 17th century and comprise 5 bowls. The earliest examples, whose shapes clearly place them in the first third of the 17th century, are two pipes with the numbers X06-012 and Y03-011a (*fig. 5: a, b*; *fig. 6*). The first of them is a heel pipe with a bi-conical profile (narrowing towards the upper rim). It has a height of 25 mm, a maximum diameter of 18 mm and an internal volume of 1 cm^3. The embossed decoration on the back of the bowl (i. e. facing the smoker) is unfortunately not in very good condition, although it is probably an angel's face with the rests of hair (*fig. 6*). The second pipe has an archaic appearance and is of poor quality, with a very atypical shape, so the place of production cannot be given any more specifically.

The whole shape of the next pipe, E21-001a (*fig. 5: c*; *fig. 7*), was unfortunately not preserved, so it cannot be classified more precisely based on its shape. The heel mark is uncrowned letters C·K, which appear on products from Gouda made in 1737-1897 (*Duco 2003*, 161). However, this fragment is not like Dutch products in terms of shape, material or quality. Together with pipe L20-002 (*fig. 5: d*), whose shape is also not that of a Dutch product, we can classify it as coming from the 17th century, most probably from the second third.

Pipe D17-1270 (*fig. 5: e*; *fig. 8*), which has a bi-conical bowl and heel, is an example of high-quality work. This is an example of basic type I (*Duco 1987*, 34; *Duco 2003*, 203), which was popular in developing variants in 1610-1675, and this item should be classifiable as coming from the end of the first third/beginning of the second third of the 17th century. The spur mark – a crowned I·P – is given only for the years 1702-1709/1720 in the Gouda product catalogue (*Duco 2003*, 164). The pipe's shape, however, does not correspond to this date. This mark was popular in many other production centres in the Netherlands (Amsterdam, Dordrecht, Enkhuizen/Holen, Leiden, Utrecht). According to the shape of a bowl, this pipe probably comes from Amsterdam. Another, even less probable option is that the pipe comes from London or Bristol workshops in England. The mark of the crowned IP appears here in many variants (*Oswald 1975*, 34).

Thanks to its small dimensions, pipe K21-002a (*fig. 5: f*; *fig. 9*) can also be classified as coming from the first half of the 17th century, but it is very different to ordinary products from western Europe. The pipe was made from coarse clay with small stones and is in the form of an angel's head.

Sir Walter Raleigh type

A specific decorative motif from the first half of the 17th century are pipes in the form of a man's head that is being swallowed by a crocodile (fish). This type is called a Jonah pipe (Jonnaspfeifen) or Walter Raleigh pipe. The motif is represented here by a fragment of a bowl (ZA07-001) in the form of a face with hair and an ear (*fig. 5: g*), a certain fragment of the stem from the part by the bowl (G15-3273c) shaped like a fish's mouth, and a probable stem fragment (U05-002; *fig. 5: h, i*; *fig. 10*).

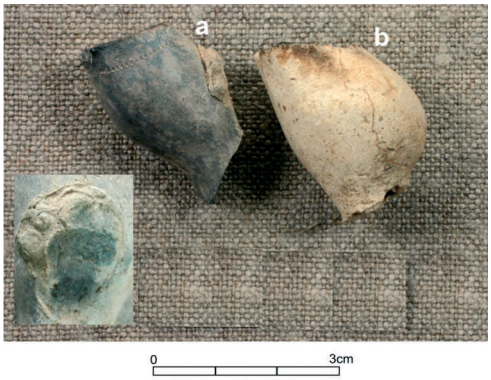

Fig. 6. Representatives of the oldest level of pipes found: a) X06-012 (close-up of a torso in the pipe's embossed decoration); b) Y03-011a.
Obr. 6. Zástupci nejstaršího horizontu nalezených dýmek: a) X06-012 (v detailu torzo plastické výzdoby této dýmky); b) Y03-011a.

Fig. 7. Pipe E21-001a with a close-up of the spur mark (enlarged).
Obr. 7. Dýmka E21-001a s detailním vyobrazením značky na patce (zvětšeno).

Fig. 8. Pipe D17-1270 with a close-up of the spur mark (enlarged).
Obr. 8. Dýmka D17-1270 s detailním vyobrazením značky na patce (zvětšeno)

Fig. 9. Pipe K21-002.
Obr. 9. Dýmka K21-002.

Fig. 10. Fragments of Sir Walter Raleigh-type pipes: a) ZA07-001; b) U05-002; c) G15-3273c.
Obr. 10. Zlomky dýmek typu Sir Walter Raleigh: a) ZA07-001; b) U05-002; c) G15-3273c.

The nobleman Sir Walter Raleigh (1552-1618), a courtier and favourite of Queen Elizabeth I, and a major promoter of tobacco and pipes, financed the establishment of the colony of Virginia, which became one of the basic suppliers of tobacco to Europe (*Brett 2006*). After the death of Queen Elizabeth I (1558-1603), he came into conflict with King James I, who was initially strongly opposed to smoking, and was executed in 1618 after long-term imprisonment (*Houser 1996*).

After his death pipes with the motif of a man being swallowed by a crocodile started to be made[8)] (*fig. 11*). This type is said to have been produced in Gouda starting in 1630.

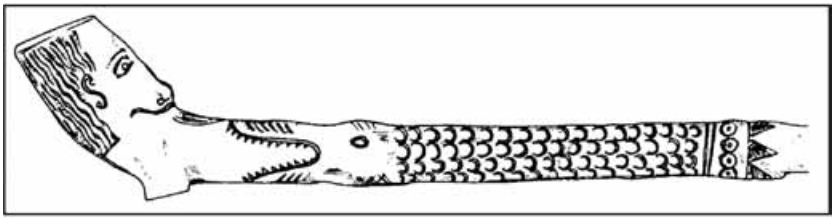

Fig. 11. Sir Walter Raleigh type pipe in one of the designs (according to *Duco 1987*, 93).
Obr. 11. Typ dýmky Sir Walter Raleig v jedné z variant (dle *Duco 1987*, 93).

Note 8:
The pipe allegedly showed an anecdotal story from Raleigh's life, where, during one of his expeditions to America, he fell into a river and was eaten by a crocodile, but because, as a heavy smoker, he was covered by soot, the crocodile threw him back; at the allegorical level the crocodile is King James I. (*Dvořák 1982*). The truth is, however, that Raleigh never visited America himself and only helped organize and finance many transatlantic voyages.

Specific Central European products from the second half of the 17th century

Finds of pipes whose shape, decoration and, in particular, method of production is different to the norm in most other western European centres in this period are specific and very interesting. There are six examples of bowls from such pipes (*fig. 5: j-m*; *fig. 12*) and very probably at least 5 stem fragments (*fig. 13: k*). These pipes are characterised by their shape, where the pipe's upper rim follows its diameter. The decorative element is mostly rouletting, either in wider form in the lower part of a bowl (such as the pipes from this research), or a narrower band in the upper half of the bowl. The motifs filling the bands are very varied – geometric decoration in the form of a grid, triangles, plant and animal motifs, as well as letters. Another variant are pipes with an embossed decoration in the form of face (in an oval stamp) on the back of a bowl, i. e. on the side facing the smoker (*Lisowa 1983*).

Findings about production technology are relatively new. In contrast to the ordinary production procedure described above, for these pipes the bowls and stems were produced independently and linked by hand in the final stage of production (*Kluttig-Altmann 2005*). The quality of such products is a long way from that of Dutch pipes from Gouda, which were flooding Europe at this time. Raw materials that were not very good, numerous fingerprints on the surface, frequently worn decoration and crooked stems are other specific characteristics. The green or green-and-yellow outer glaze is interesting and covers part of the stem by the bowl and, in some cases, part of the inner wall of the bowl (which is hard to understand from the viewpoint of practical use). Only some pipes are glazed and pipes that are the same type can be either glazed or unglazed. The totality of such specifics gives rise to marked questions regarding the place(s) of production, primarily with regard to the relatively wide area of Central Europe where such pipes are found. In Bohemia there are finds, for example, in Hradčany (*Frolík – Žegklitz 1988*; *Frolík – Žegklitz – Boháčová 1988*) and from research at a glassworks in Broumy (see text in this volume). In Germany this concerns the cities

Fig. 12. Central-European pipes from the second half of the 17th century: a) R22-005; b) Y04-006; c) Z05-012; d) – Z06-015.
Obr. 12. Dýmky středoevropské produkce druhé poloviny 17. století: a) R22-005; b) Y04-006; c) Z05-012; d – Z06-015.

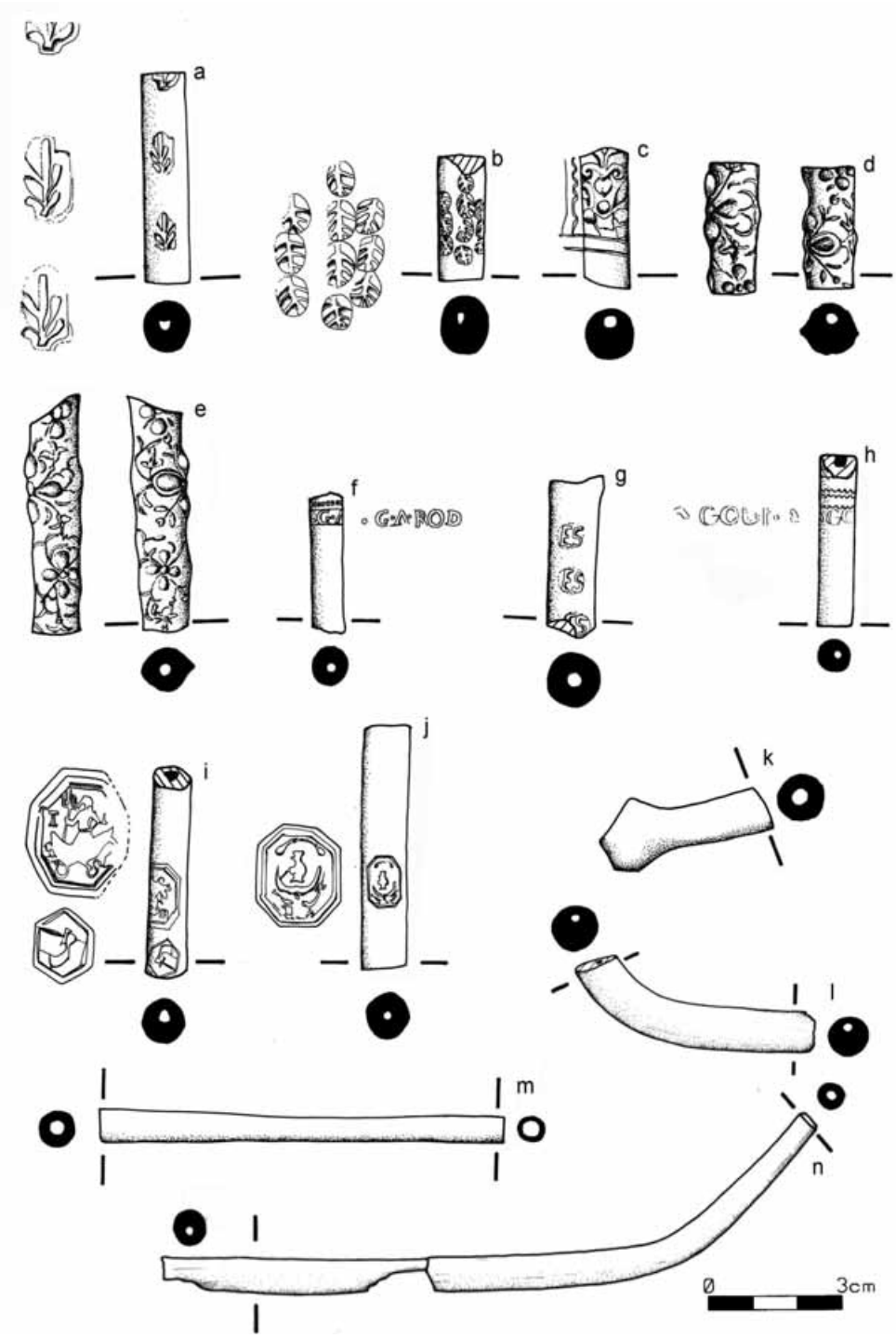

Fig. 13. a) W16-100; b) X06-021; c) Z04-011; d) G15-3273b; e) T11-167; f) U07-003; g) Y03-011b; h) Y31-048b; i) G15-3273a; j) V07-007; k) V09-004; l) U20-013; m) V06-028; n) P24-044. Marks and details enlarged on a scale of 2:1, unless specified otherwise. *Drawings by L. Nohovcová, J. Votava.*
Obr. 13. a) W16-100; b) X06-021; c) Z04-011; d) G15-3273b; e) T11-167; f) U07-003; g) Y03-011b; h) Y31-048b; i) G15-3273a; j) V07-007; k) V09-004; l) U20-013; m) V06-028; n) P24-044. Značky a detaily zvětšeny v měřítku 2:1, není-li uvedeno jinak. *Kresba L. Nohovcová, J. Votava.*

of Freiburg (*Röber 1999*), Leipzig, Halle (*Standke 2005*) and Amberg (*Mehler 2004*), as well as Wroclaw, for example, in Poland (*Witkowska 1998*). Most of the authors mentioned do not give an opinion on the place of production, and if they do this is only at the level of deliberations, and they locate the places of production as being in Germany, Silesia, or even in the Czech lands.

Regarding the question of the time these products were produced, most authors agree on the second half of the 17th century. This interval is supported not only by the circumstances of finds in various locations where the pipes occur, but also, primarily, a find of one example from a relatively wide-ranging and first published set of such pipes from archaeological research on Dominikánské Square in Wroclav (*Witkowska 1998*). The pipe bears the inscription F. WIRFEL 1672 in a band in the lower part. This dated the pipe

reliably, although the name in question has not yet been found in written sources.

Of our finds the most interesting was pipe Y04-006 (*fig. 5: k*; *fig. 12: b*), bearing an unfortunately illegible letters in the lower part. The pipe is mostly glazed, even inside, but was used. Pipes R22-005 (*fig. 5: j*; *fig. 12: a*) and Z06-015 (*fig. 5: l*; *fig. 12: d*) are examples of very detailed decoration (embossed lattice) in glazed and unglazed variants. The internal volumes of the pipes found are between 0.75 and 2 cm^3.

Fig. 14. Various crowned H marks: a) E21-002a; b) G16-110a; c) N35-014a; d) Z05-009a; e) Z05-009b; f) Y31-048a.
Obr. 14. Varianty značek korunovaného H: a) E21-002a; b) G16-110a; c) N35-014a; d) Z05-009a; e) Z05-009b; f) Y31-048a.

H mark

This mark was easily the most popular in our finds, with a total of 6 examples (*fig. 5: n-t*; *fig. 14*). The fragments found have very different information values and are also very different in terms of appearance, quality and the actual mark in the form of a crowned letter H. The best-preserved and, coincidentally, the most carefully made example is a heel pipe (N35-014a – *fig. 5: n*). The height of the bowl, which has a polished surface, is 38 mm and the upper diameter of the rim is 22 mm (the internal volume is 2.5 cm^3). The pipe's shape places it in the first third of the 18th century and, given its high quality, we can say that it comes from Gouda. Catalogues say this mark was used in Gouda between 1661-1825 by a total of ten pipe-makers, or their widows (*Duco 2003*, 152). The crowned H is also very detailed on pipe fragment Z05-009a, only the lower third of which was preserved. We can also date this fragment to the 18th century and, thanks to its high-quality, polished surface, we can say that it came from Gouda. The design of other examples indicates they probably came from other places. The crowned H mark was used in other production centres, such as St. Omer (France), Andenne (Belgium), and 's-Hertogenbosch (Holland).

Fig. 15. Pipe Z03-013 with a close-up of the spur mark (enlarged).
Obr. 15. Dýmka Z03-013 s detailním vyobrazením značky na patce (zvětšeno).

Other products from the end of the 17th century and 18th century

An example with a very good heel mark is pipe Z03-013 (*fig. 15: a*; *fig. 16*). The pipe has a high-quality, polished surface and is an early type II with a funnel-shaped bowl, which dates from between the 1680s and the first decade of the 18th century (*Duco 1987*, 45). The heel bears a mark in the form of a three-armed candlestick, which is given in the Gouda product catalogue as being for 1675-1755 (*Duco 2003*, 140). In this case we can determine the names of the pipe-makers in whose workshop they were made. Between 1675-1691 it was Lambert Willemsz Proefhamer and between 1691-1720/1744 it was Jakob Pietersz van der Meij. Unfortunately, the only part of pipe ZA05-001 (*fig. 15: b*) that was preserved was part of the heelless pipe bowl; the shape puts it in the same period as the previous pipe thanks to its

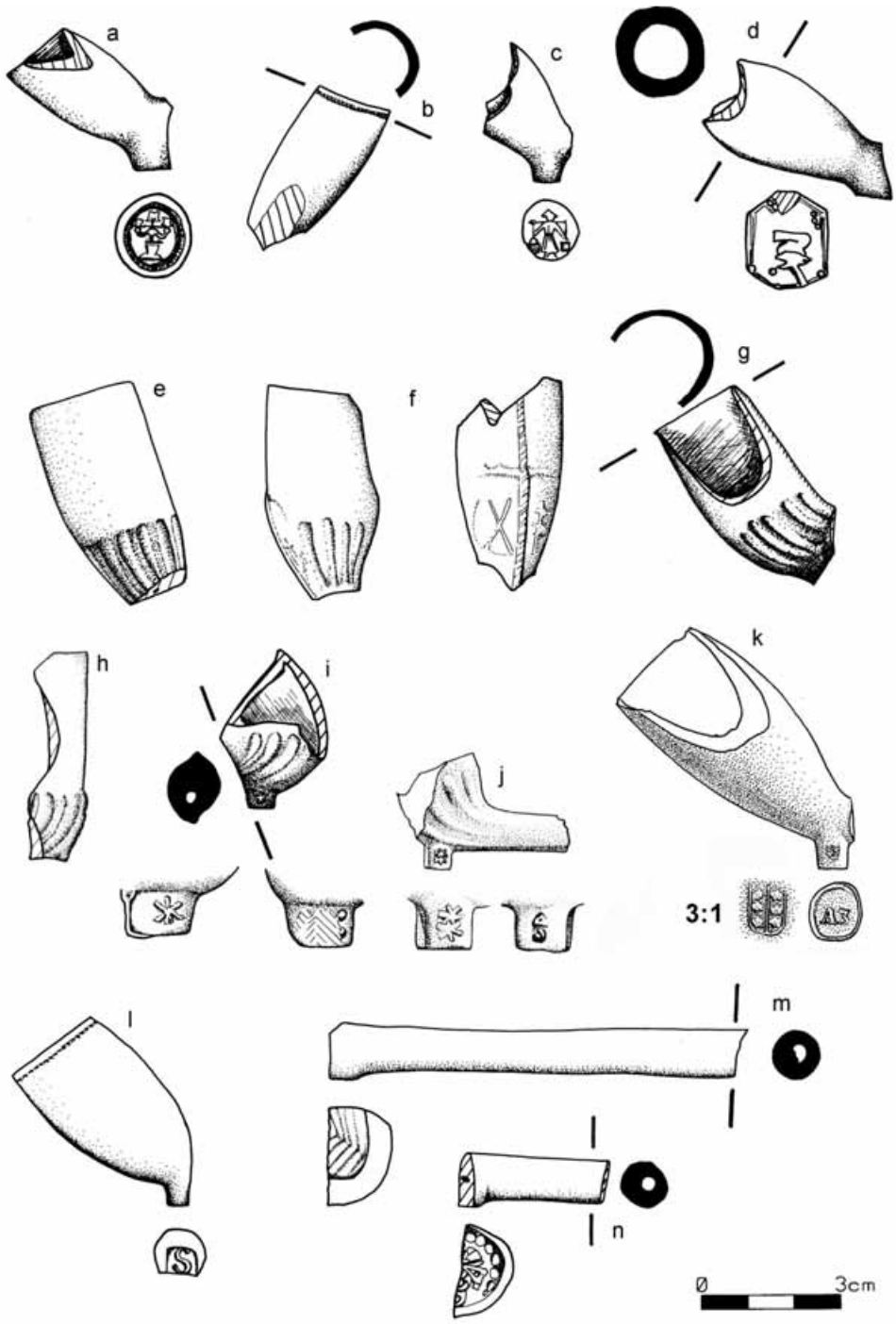

Fig. 16. a) Z03-013; b) ZA05-001; c) W15-110; d) Y09-001a; e) N35014b; f) W32-008; g) Z05-003; h) L37-031; i) M17-100; j) U19-004; k) M21-028; l) ZB06-001; m) Z28-017; n) ZA07-071. Marks and details enlarged on a scale of 2:1, unless specified otherwise. *Drawings by L. Nohovcová, J. Votava.*
Obr. 16. a) Z03-013; b) ZA05-001; c) W15-110; d) Y09-001a; e) N35014b; f) W32-008; g) Z05-003; h) L37-031; i) M17-100; j) U19-004; k) M21-028; l) ZB06-001; m) Z28-017; n) ZA07-071. Značky a detaily zvětšeny v měřítku 2:1, není-li uvedeno jinak. *Kresba L. Nohovcová, J. Votava.*

quality and its smoothed (but not polished surface) surface, which probably makes it a Dutch pipe. Only a small fragment of spur pipe W15-110 (*fig. 15: c*) was preserved, but it is of a very high quality, and the polished surface and mark point to Gouda. The mark showing a milkmaid (a figure with two buckets) is relatively frequent in finds and its popularity shows the long interval of its use, from 1647/55 to 1920, by a total of 23 producers (*Duco 2003*, 137). We can probably date it to somewhere in the 18th century. Another heel pipe, Y09-001a (*fig. 15: d*), is an example of negligent working and has numerous traces of poor-quality work. A polygonal stemp on the front of the bowl in the form of an unidentifiable mark unfortunately does enable it to be better classified. Given its shape, we can date it to the end of the 17th/beginning of the 18th century, or the first half of the 18th century.

Fig. 17. Pipes with embossed ribbing on lower part of the bowl: a) N35-014b; b) Z05-003; c) W32-008.
Obr. 17. Dýmky s plastickým žebrováním na spodní části hlavičky: a) N35-014b; b) Z05-003; c) W32-008.

There is an interesting group of five finds (*fig. 15: e-j*; *fig. 17*) that are pipes with embossed decoration in the form of ribbing in the lower half or third of the bowl. They appear in the form of heel pipes and heelless pipes and are found relatively frequently in Germany and Poland.[9)] In our finds the seam in the front part of the bowl is always very clear on the bowl (trace of working in a mould) and is very often worked with oblique cuts. Heel pipes are characterised by a typically sharp angle between the bowl and the stem (around 110°), whereas in the case of heelless pipes the stem leads down from the bowl (angle of around 160°). Given the size of the bowls (heights of between 40 and 50 mm, the inner volume of a bowl W32-008 is 4.5 cm3) we can date all the pipes to the 18th century, probably the second half. The heel pipes do not have marks on the bottoms of the heels, but on the sides. They are combinations of a six-pointed star (one or two above each other) on one side and simple points on the other (*fig. 15: i-j*). Pipe Z05-003 (*fig. 15: g*) is interesting as the bowl space and the stem hole were not connected. This reject could not have been used and, if it was ever sold to anybody, it certainly will not have pleased its owner.

The remaining three pipe fragments (O15-368, V09-001, Z05-014) cannot be dated more specifically than to the course of the 18th century.

Note 9:
Similar pipes were found in the German cities Wedel, Haseldorf (*Weidner 1999*), Wittenberg (*Wagschal 2000*) and Waldenburg (*Standke 2003*), as well as in Wroclaw in Poland (*Lisowa 1983*).

Fig. 18. Pipe M21-028 from the manufactory in Zborowskie. Close-up of mark on lower part and side of heel (enlarged).
Obr. 18. Dýmka M21-028 z manufaktury ve Zborowském. V detailu značka na spodní a boční části patky (zvětšeno).

Prussian products from the second half of the 18th century and beginning of the 19th century

Zborowskie (Sborovsky)

Pipe M21-028 (*fig. 15: k*; *fig. 18*) is undoubtedly from a Prussian manufactory. The heel pipe's relatively high-quality surface, a height of 52 mm, and a maximum diameter of 26 mm indicate it is from the second half of the 18th century. The heel mark is a combination of a letter and number (A3) and the mark on the side of the heel is the crest of the city of Gouda (a crest with six stars in two vertical fields). It is clearly a product from a workshop in Zborowskie[10)] (Lubliniec District, Silesia).

These Prussian workshops started producing pipes in 1752. They took advantage of not only a deposit of quality kaolin clay nearby, but also subsequent support from King Frederick II the Great (1740-1786). In 1754 he imposed a unilateral customs duty on pipe imports from other countries and in 1765 he banned imports altogether. Thanks to this, the Prussian pipe market was practically entirely controlled from these workshops. Production in Zborowskie started upon the arrival of 12 masters and workers from Holland, who brought some workshop equipment. The pipes were of a very reasonable quality and approached that of the famous pipes from Gouda in Holland.[11)] The vast majority of the products were undecorated pipes, classic funnel shapes based on Dutch products. Only some of the products had, for example, embossed ribbing in the form of a human face or embossed Prussian crest with the initials FR (Fredericus Rex) at their lower part. The spur marks were mostly combinations of a letter and a number on the following scales: A-D and 1-5, an eagle mark was also frequent, but other marks also appear (e. g. the letter W in an astragal circle). The crest of Gouda appears very

Note 10:
Other Prussian pipe-making centres included, in particular, Rościn, Weissenspring, Berlin, and Salzwedel.

Note 11:
During the largest boom, the pipe-making industry employed up to 115 workers (1789), and records from the end of the 18th century/beginning of the 19th century talk about an annual production of 600,000 to 800,000 pipes, made by 50 workers.

frequently on the side of the heel.[12] It was used on products from Gouda from 1739 as a mark of quality for pipes of the highest quality: the goods from Zborowskie are clearly attempting to take advantage of the Dutch products' reputation. The words SCHLESIS-FABRIC or FABRIKE IN-SCHLESIEN[13] can appear on the stems of such pipes (*Bilinska 2004*). Production in Zborowskie ended in the 1860s and this was related to the fall in popularity of clay one-piece pipes and the rise of pipes made from other materials (porcelain, meerschaum – sepiolite, briar) and, later, cigars and cigarettes (*Witkowska 1998*).

Note 12:
Even though the municipal coat of arms of the city of Gouda is the most frequently found, the sides of the heels contain badges of other cities, and a whole range of other marks, for example three-leaved plants and a six-pointed star (*Witkovska 1997*).

Note 13:
The first version of the word appears on older products and the letter size is 4 mm, the second version, with letters 2.5 mm high, appears on younger products.

Rościn (Rostin)

A second, very high-quality, polished, markedly white heel pipe (ZB06-001) with the simple mark of a letter S (*fig. 15: l*) has an almost egg-shape and dates from the end of the 18th century, or perhaps the start of the following century. It may have been produced in another important Prussian workshop, in Rościn (Myślibórz District, West Pomerania).

The manufactory was established in 1752 by village owner Captain Hans Albrecht Ernst von Bredow (he started to take advantage of nearby kaolin deposits), and he soon obtained a licence to sell in Prussia, Saxony and Pomerania. After a decline during the Seven Years' War (1756-63) he sold his assets, including the workshop, to Wilhelm Ludwik Lüder, who was not able to get over the problems, which had a significantly negative effect on product quality. The production and quality problems were later overcome by one of the best known Stettin merchants and industrialists, Isaac Salinger.[14] Production is thought to have ended in 1804, when Salinger died (*Witkowska 1989/90*).

Note 14:
In 1800 the manufactory had 45 workers and produced goods worth 19,000 tolars. At least half of what was produced was exported, mostly to what was Poland at that time.

Products from this workshop are also based on the Dutch tradition (*Mikłaszewicz 1995*). The marks on these pipes very frequently copy those on products from Gouda (marks in the form of a windmill, anchor, crest of Gouda, as well as a range of uncrowned letters). The writing on the stems appears in various variants – FABRIQUE (ZU) ROSTIN, ROSTIN ROSTIN, SALINGRE IN GOUDA, FABRIQ SALINGRE ROSTIN, ·FABRIQ LVBECK·ROSTIN (*Teichner 2000*; *Walkiewicz 2000b*).

Stems

Until now I have only looked at the parts of heel and heelless pipes whose information value is higher in an optimum case – i. e. pipe bowls. However, there were perhaps ten times more finds of the most fragile part of pipes – stems. Of a total number of 231 parts found, 64 of them were decorated in some way. Pipe stem lengths differed depending on the quality of the product and the time of production. In general it can be said that they were between ten and several dozen centimetres,[15] but only fragments survived in the finds (with an average length of between 20 and 70 mm). The maximum length of a surviving stem was 15 cm. In general it can be said that the stems with a larger diameter that were more roughly worked come from an older period, the 17th century.

Note 15:
In the 17th century the pipe-makers' guild in Gouda set the length of the stem for high-quality pipes at 55 cm, but produced 4 other types of pipe with a longer stem. Ordinary quality pipes had a maximum length of 28 cm (*Duco 1987*).

Note 16:
Until 1650 decoration on products from Gouda is concentrated only on the upper part of the stem in the form of stamps, after the middle of the 17th century the decoration is around the whole stem, first in two bands, then in one band in the central part of the stem.

Decoration appears in many various forms and most of the motifs appear over long periods of time. The decorative motifs were created using rouletting or stamps.[16] Parts that are more embossed, such as plant motifs or Jonah-pipes, were created in a mould. Decoration by twisting (*fig. 19: a*) or squeezing (*fig. 19: e*) is specific. Mostly only a part of a stem was decorated in such a manner.

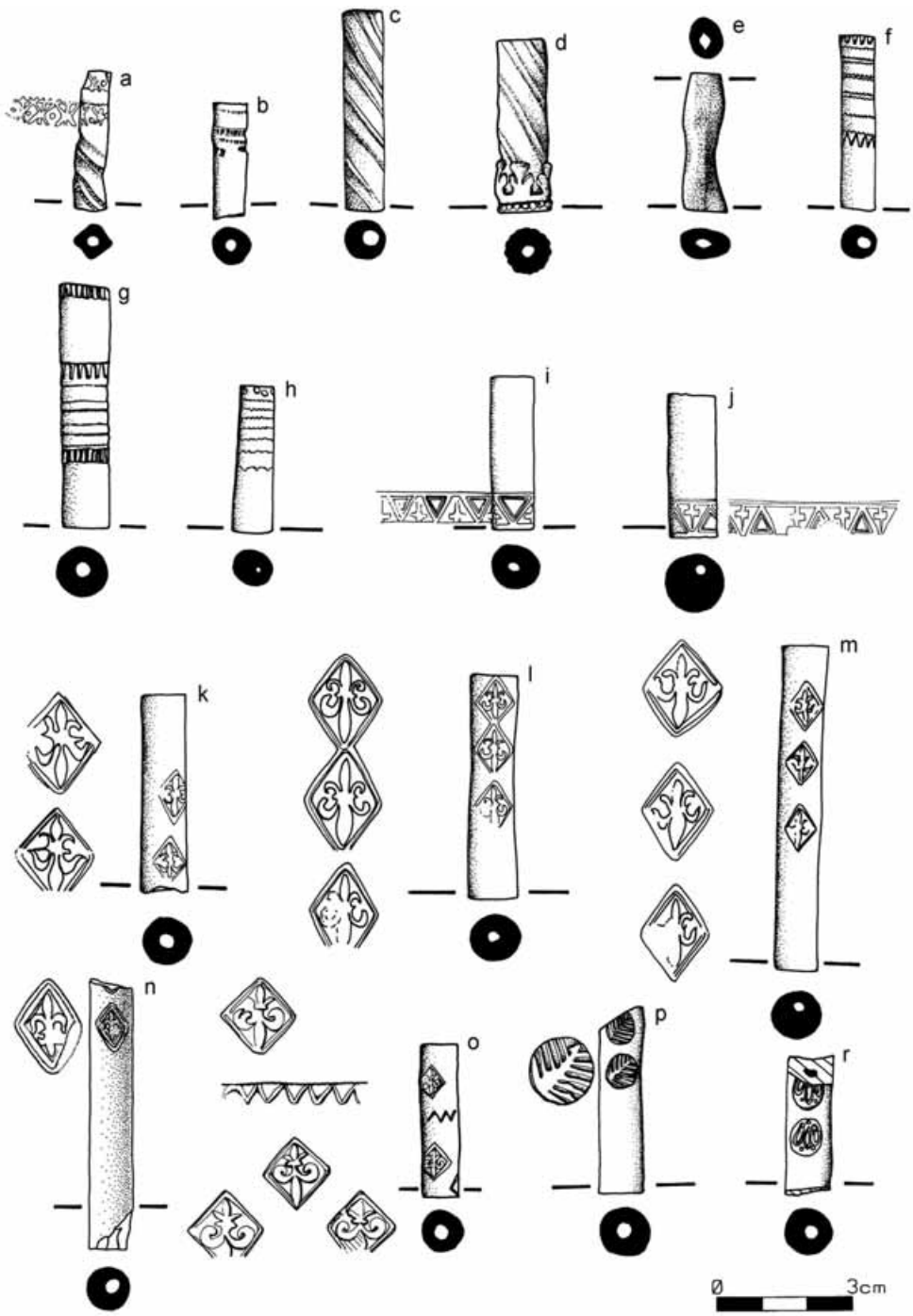

Fig. 19. a) B06-010; b) G16-110b; c) G15-3269; d) Z08-017; e) J05-003; f) Y07-003; g) N35-014c; h) U12-147; i) X04-007; j) Z06-001; k) X10-005; l) Z07-013; m) Y10-069; n) K21-002b; o) L09-001; p) O15-2109; r) Y09-001b. Marks and details enlarged on a scale of 2:1, unless specified otherwise. *Drawings by L. Nohovcová, J. Votava*.

Obr. 19. a) B06-010; b) G16-110b; c) G15-3269; d) Z08-017; e) J05-003; f) Y07-003; g) N35-014c; h) U12-147; i) X04-007; j) Z06-001; k) X10-005; l) Z07-013; m) Y10-069; n) K21-002b; o) L09-001; p) O15-2109; r) Y09-001b. Značky a detaily zvětšeny v měřítku 2:1, není-li uvedeno jinak. *Kresba L. Nohovcová, J. Votava*.

Decoration can include partial glazing of the stem by pipe bowls (*fig. 13: k*). More precise dating is often assisted by words giving the place of production, name of producer (or seller), year, or writing with the place of distribution (sale).

The most frequent decorative motif in our finds are bands of small triangles, squares, rectangles, astragal bands and crosses applied by wheel-pressing (*fig. 19: b, f-j*). Such decoration is typical for the whole of the 18th century. Decoration using stamped fleur-de-lys in diamonds is also very frequent (*fig. 19: k-o*) and is said to have appeared on pipes between 1620-1660 (*Noll 2004*). Other specific decoration is in the form of leaves on three stem fragments (*fig. 19: p*; *fig. 13: a-b*). There are three examples of stem fragments with rich embossed decoration with plant motifs (*fig. 13: c-e*). Pipes with this rich Baroque decoration covering the bowl and stem are from the first two thirds of the 17th century (*Duco 1987, 88*; *Schmaedecke 2002*; *2003*). There are three

examples of stems with letters. Stem U07-003 (*fig. 13: f*) bears the letters G.A.ROD and probably comes from a pipe produced in Großalmerode, in north Hesse[17)] (*Stephan 1995*). The next piece bearing letters is the one with letters ES in a circular stamp (stem Y31-011b – *fig. 13: g*); this pair of letters (uncrowned and crowned) appears on the bowls of Dutch pipes, but it is not possible to say pipes with this mark on the stem come from there, neither is it possible to date them more accurately. With regard to the poor quality and thicker diameter, they can be placed in the 17th century. The last stem with letters is stem Y31-048b (*fig.13: h*), which probably bears the word GOUDA. The high-quality of the stem fragment indicates it really was from this production centre, although, given the frequent use of the name Gouda on pipes from other production centres, we cannot be entirely sure of its place of origin, which is undoubtedly datable to the 18th century. There are also specific stemps – in our case this concerns stem G15-3273a with a polygonal stamp of an arm with a sword, and a figure (Neptune?) with a trident on a ship (*fig. 13: i*). Another polygonal stemp is a crest (?) on stem V07-007 (*fig. 13: j*). The place these pipes were produced could not be identified.

The catalogue also includes bent stems represented by two fragments (*fig. 13: l*) and stems – mouthpieces (5 pieces) in our finds bearing only a simple vertical or oblique cut (*fig. 13: m-n*).

Note 17:
A similar mark, CHR.CSM. GA. RODA, appears on a stem found in Tostedt (Harburg district) and, most probably, is from the pipe-maker Johann Christian Casselmann (1719-1783), who was active in Großalmerode (*Articus 1997*).

Conclusion

The pipes from Republic Square are a rich range of finds that fit in relatively well with the image of a Central European metropolis as a cultural and trade crossroads. I strongly believe that this article will contribute to a more detailed understanding of the spread of pipes from western Europe and is only the first of many that will examine these specific finds in the Czech Republic.

With the development of interest in post-medieval archaeology and an increased number of archaeological excavations, as well as detailed research into written sources, finds will not only be presented, but other matters, such as production centres in the Czech lands (their form, products), will be resolved; written sources will also be used to examine matters related to the import and distribution of foreign products (regulations, restrictions), and for a more detailed analysis of the spreading of the smoking habit in its socio-economic context (*Cessford 2001*; *Peacey 1996*).

Catalogue of bowls and selected stems

Each item contains a basic description in words and technical data. The abbreviations used to describe the dimensions are shown on a diagram (*fig. 20*). Next to the number of the stratigraphic unit, which is the identification number for a find, there is the bag number (b. no.) for the find, an abbreviation of the name of the section of area the find comes from (AB – Archaia Brno, AP – Achaia Praha, NPÚ – archaeological department of the National Institute of the Care of Monuments – the territorial specialized department in Prague), and the location of the find in the drawings table. The item „found" determines the stratigraphic layer with the dating interval ascertained based on preliminary archaeological findings by colleagues from different sections of the research. The „dating" item gives the time classification of the various artefacts based on their typology, morphology and decoration in the author's opinion.

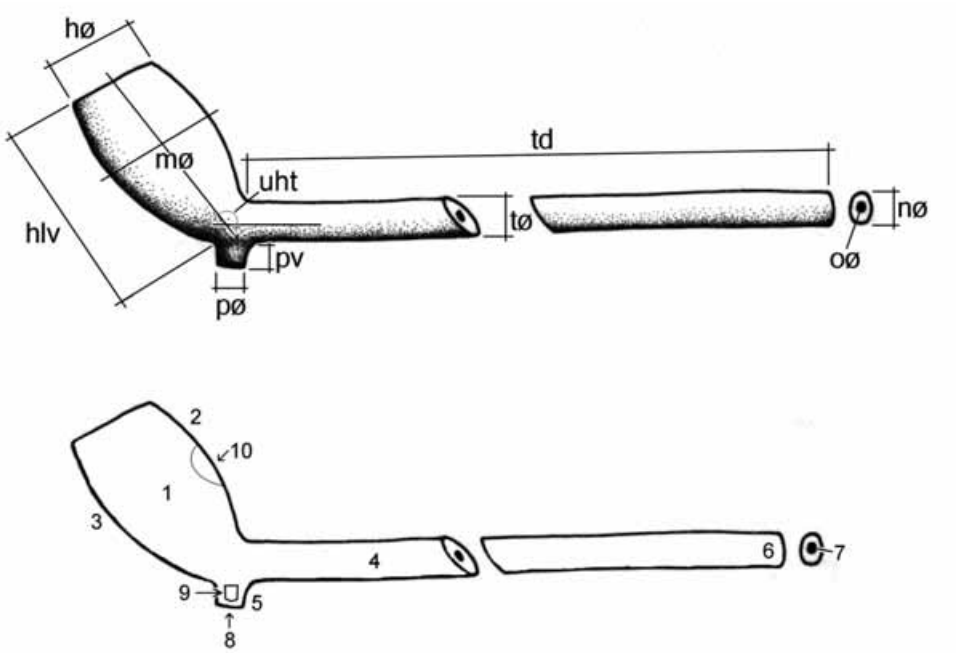

Fig. 20. Diagram of spur pipe:
Dimensions:
hØ – upper outer diameter of bowl
mØ – maximum outer diameter of bowl
mmØ – maximum measurable outer diameter of bowl
hlv – height of bowl
dhlv – surviving height of bowl
uht – angle between bowl and stem
pØ – diameter of heel
pv – height of heel
td – surviving length of stem
tØ – diameter of stem
nØ – diameter of mouthpiece
oØ – diameter of stem opening (stem hole)
Description of parts of pipe:
1 – bowl
2 – back of bowl
3 – front of bowl
4 – stem
5 – heel/spur
6 – mouthpiece
7 – stem hole
8 – spur mark
9 – mark on side of spur
10 – mark on the back of the bowl

Obr. 20. Schematické znázornění jednodílné dýmky:
Rozměry:
hØ – horní vnější průměr hlavičky dýmky
mØ – maximální vnější průměr hlavičky dýmky
mmØ – maximální měřitelný vnější průměr hlavičky dýmky
hlv – výška hlavičky dýmky
dhlv – dochovaná výška hlavičky dýmky
uht – úhel mezi hlavičkou dýmky a troubelí
pØ – průměr patky
pv – výška patky
td – dochovaná délka troubele
tØ – průměr troubele
nØ – průměr náustku
oØ – průměr otvoru troubele (kouřovod)
Popis jednotlivých částí dýmky:
1 – hlavička dýmky
2 – vnitřní strana hlavičky
3 – vnější strana hlavičky
4 – troubel
5 – patka/ostruha
6 – náustek
7 – kouřovod
8– značka na patce
9 – boční značka na patce
10 – značka na hlavičce dýmky – vnitřní

Bowls:

D17-1270 (b. no. 2936, AB, *fig. 5: e*; *fig. 8*)
Bowl with heel, dirty white, but quality surface, inner sooting evident on the outer part of the upper rim, wheel-pressed decoration under the upper rim – band of small rectangles with a width of 1 mm.
hlv: 29 mm, hØ: 14 mm, mØ: 19 mm, uht: 135°, pØ: 9 mm, pv: 4 mm, tØ: 10 x 9 mm, oØ: 3 mm, 8: crowned I·P.
Found: modern backfill in riding school building (1st half of 17th – first half of 18th century).
Dating: turn of 1st and 2nd thirds of 17th century.

E21-001a (AP, *fig. 5: o*; *fig. 14: a*)
Fragment of bowl with heel and partially preserved rim, medium-grey poor quality surface and clay, inner sooting, not very visible wheel-pressed decoration under the upper rim – band of small rectangles.
hlv: 46 mm, hØ: 22 mm, mØ: 22 mm, uht: 135°, pØ: 6 mm, pv: 4 mm, 8: crowned H (not very good quality).
Found: infilling of trench for pillar in riding school gallery (2nd half of 19th century).
Dating: 18th century (?).

E21-001b (AP, *fig. 5: c*; *fig. 7*)
Fragment of lower part of bowl with heel without preserved rim, light beige-and-black surface, light clay, slight inner sooting.
dhlv: 24 mm, uht: 125°, pØ: 13 x 10 mm, pv: 2 mm, tØ: 11 mm, oØ: 3.5 mm, 8: letters C·K.
Found: infilling of trench for pillar in riding school gallery (2nd half of 19th century).
Dating: 2nd third of 17th century (?).

K21-002a (AP, *fig. 5: f*; *fig. 9*)
Small torso of bowl without preserved rim, light red surface and clay, marked inner sooting, the pipe is shaped like an angel's head.
dhlv: 18 mm.
Found: modern backfill above monastery garden level.
Dating: 1st half of 17th century (?).

L20-002 (AP, *fig. 5: d*)
Bowl without preserved heel, light beige surface and clay, marked inner sooting considerably going over the rim, wheel-pressed decoration around 4 mm under the upper rim.
hlv: 32 mm, hØ: 16 mm, mØ: 19 mm, uht: 135°.
Found: modern backfill above monastery garden level.
Dating: 2nd third of 17th century.

L37-031 (AP, *fig. 15: h*)
Fragment of heelless bowl with preserved rim, light brown-and-white surface, light clay, slight inner sooting, embossed ribbing decoration in the lower third of the bowl.
dhlv: 47 mm, mØ: > 19 mm.
Dating: 18th century.

M17-100 (b. no. 83, AB, *fig. 15: i*)
Fragment of lower part of bowl with heel, light yellow-and-white clay, embossed ribbing decoration in the lower part of the bowl, very marked seam.
pv: 4 mm, pØ: 5 mm, 9a: six-pointed star with a diameter of 3 mm, 9b: two points above each other.
Found: modern backfill above monastery garden level.
Dating: 18th century.

M21-028 (AP, *fig. 15: k*; *fig. 18*)
Bowl with heel, light white-and-brown surface and clay, strong inner sooting going over the outer rim.
hlv: 52 mm, hØ: 23 mm, mN: 26 mm, uht: 140°, pØ: 6 mm, pv: 7 mm, 8: A3, 9: Gouda mark (shield with six stars divided into two fields).
Found: infilling of trench for foundation wall for barracks stables (building H).
Dating: 2nd half of 18th century.

N35-014a (AP, *fig. 5: n*; *fig. 14: c*)
Bowl with heel, very high-quality surface (polished), marked inner sooting, wheel-pressed decoration 1 mm under upper rim – band of small rectangles. hlv: 38 mm, hØ: 22 mm, uht: 130°, pØ: 7 mm, pv: 4 mm, tØ: 9 mm, 8: crowned H.
Found: infilling of monastery (barracks) pit (1st half of 17th century – middle of 19th century).
Dating: 1st third of 18th century.

N35-014b (AP, *fig. 15: e*; *fig. 17: a*)
Fragment of bowl without heel with partially preserved rim, embossed ribbing decoration in the lower part of the bowl, very poor quality surface (cracks), rim cut negligently and with irregular thickness (1.5 – 3 mm), slight inner sooting, nicks on the seams (from the left down) with a length of 5 mm.
dhlv: 48 mm, hØ: 23 mm, mØ: 24 mm, uht: 160°.
Found: infilling of monastery (barracks) pit (1st half of 17th century – middle of 19th century).
Dating: 18th century.

O15-368 (b. no. 40, AB)
Small fragment of bowl without preserved rims, poor-quality surface, slight inner sooting.
dhlv: 30 mm.
Found: infilling of trench for barracks stables (building H, middle of 19th century).
Dating: 1st half of 18th century (?).

P18-020 (AP)
Small fragment of lower part of bowl with heel without preserved rim, light green glaze, white clay, geometric decoration.
dhlv: 22 mm, pØ: 6 mm, pv: 1 mm.
Found: infilling of trench for recent drains.
Dating: 2nd half of 17th century.

R22-005 (AP, *fig. 5: j*; *fig. 12: a*)
Bowl (deformed) with heel and preserved rim, outer green glaze going over the upper rim, white clay, embossed geometric decoration in the lower part of the bowl (cut band of squares).
hlv: 35 mm, hØ: 12 mm, mØ: 20 mm, uht: 125°, pØ: 9 mm, pv: 4 mm.
Found: modern backfill above monastery garden level.
Dating: 2nd half of 17th century.

T19-021a (AP)
Small fragment of bowl without preserved rims, outer light green glaze, white clay, embossed decoration.
dhlv: 22 mm.
Dating: 2nd half of 17th century (?).

U19-004 (AP, *fig. 15: j*)
Fragment of lower part of bowl with heel without preserved rim, not very high-quality surface, white clay, embossed ribbing decoration in lower part of bowl.
dhlv: 20 mm, uht: 110°, pØ: 6 mm, pv: 5 mm, tØ: 9 x 7 mm, 9a: two six-pointed stars one above the other, 9b: two points one above the other.
Found: infilling of trench by research probes.
Dating: 18th century.

V09-001 (b. no. 1270, NPÚ)
Small fragment of bowl with preserved rim, carefully worked white-and-grey marbled surface, light grey clay, marked inner sooting, wheel-pressed decoration 1 mm under the rim – band of cut small rectangles.
dhlv: 27 mm.
Found: infilling of building V146, barracks level (from middle of 19th century).
Dating: 18th century.

W15-110 (b. no. 805, AB, *fig. 15: c*)
Lower part of bowl with heel without preserved rim, very high-quality surface (polished), inner sooting.
dhlv: 33 mm, mmØ: 18 mm, uht: 135°, pØ: 5.5 mm, pv: 4 mm, oØ: 2 mm, 8: figure –milkmaid.
Found: monastery garden level.
Dating: 18th century.

W32-008 (AP, *fig. 15: f*; *fig. 17: c*)
Bowl without heel with partially preserved rim, negligently finished surface (unpolished), light clay, inner sooting, embossed ribbing decoration in the lower part of the bowl.
hlv: 47 mm, hØ: 23 mm, mØ: 25 mm, 3: mark – in the "crest" on the left X (or crossed lances), an anchor on the right (?), marked middle seam dividing the space of the "crest" into two halves.
Found: layer covering the monastery's brick drains.
Dating: 18th century.

X06-012 (b. no. 845, NPÚ, *fig. 5: a*; *fig. 6: a*)
Bowl with heel (only fragment preserved) and preserved rim, light to dark grey surface, inner sooting, wheel-pressed decoration 3.5 mm under upper rim – band of small rectangles (triangles).
hlv: 25 mm, hØ: 15 mm, mØ: 18 mm, uht: 145°, pØ: 9 mm, pv: 5 mm, 3: torso of embossed decoration – indefinable (16 x 12 mm), 8: indefinable – parallel lines.
Found: under monastery garden level.
Dating: 1st third of 17th century.

Y03-011a (b. no. 418, NPÚ, *fig. 5: b*; *fig. 6: b*)
Bowl without heel with partially preserved rim, light grey roughly worked surface and clay, inner sooting, wheel-pressed decoration under the upper rim – band of small rectangles.
hlv: 28,5 mm, hØ: 17 mm, mØ: 21.5 mm, tØ: 12 x 11 mm, oØ: 3 mm.
Found: under monastery garden level.
Dating: 1st third 17th century.

Y04-006 (b. no. 248, NPÚ, *fig. 5: k*; *fig. 12: b*)
Bowl with heel, inside and outside (two-thirds) green-and-yellow glaze, negligently finished surface (numerous fingerprints), dirty white clay, embossed band in the lower part of the bowl with negligently worked and unidentifiable writing.
hlv: 32 mm, hØ: 20 x 19 mm, uht: 125°, pØ: 9 mm, pv: 3 mm.
Found: infilling of the pit V003 (probably barracks level).
Dating: 2nd half of 17th century.

Y09-001a (b. no. 411, NPÚ, *fig. 15: d*)
Bowl with heel (damaged) without preserved rim, surface negligently finished with numerous nicks (numerous brown stains), no sooting, inner nick when hole was made in stem (negligence), a band of cut small triangles under the upper rim (2 x 1 mm).
dhlv: 40 mm, mØ: 21 mm, uht: 150°, pØ: 9 x 7 mm, pv: 1 mm, 3: polygonal mark (unidentifiable).
Found: building backfill – barracks level.
Dating: 1st half of 18th century.

Y31-048a (AP, *fig. 5: p*; *fig. 14: f*)
Fragment of bowl with heel without preserved rim, surface smoothed, but with minor inaccuracies, inner sooting.
dhlv: 40 mm, mØ: 20 mm, pØ: 5.5 mm, tØ: 7 x 6 mm, oØ: 2 mm, 8: crowned H.
Found: infilling of trench for foundation wall of main barracks building (middle of 19th century).
Dating: 18th century.

Z03-013 (b. no. 357, NPÚ, *fig. 15: a*; *fig. 17: b*)
Bowl with heel with preserved rim, very high-quality surface (polished), inner sooting, wheel-pressed decoration 1 mm under upper rim – band of small rectangles.
hlv: 30 mm, hØ: 16.5 mm, uht: 140°, pØ: 8.5 mm, pv: 4 mm, tØ: 11 x 10 mm, oØ: 2.5 mm, 8: three-armed candlestick.
Found: probably monastery garden level.
Dating: around 1680-1710.

Z05-003 (b. no. 93, NPÚ, *fig. 15: g*)
Bowl with heel, very rough white surface (unsmoothed, numerous marks due to rough cutting), white clay, unused pipe – unopened stem hole, embossed ribbing decoration in the lower part of bowl.
hlv: 43 mm, hØ: 22 mm, mØ: 23.5 mm, uht: 125°, pØ: 5 mm, pv: 5 mm, 9: two points one above the other.
Found: boundary of monastery garden level and barracks level.
Dating: 18th century.

Z05-009a (b. no. 1358, NPÚ, *fig. 5: r*; *fig. 14: d*)
Lower part of bowl with heel, relatively high-quality surface (polished), slight inner sooting.
dhlv: 29 mm, mmØ: 18 mm, uht: 135°, pØ: 6 mm, pv: 5 mm, 8: crowned H.
Found: probably barracks level.
Dating: 18th century.

Z05-012 (b. no. 218, NPÚ, *fig. 5: m*; *fig. 12: c*)
Lower part of bowl with heel, poor quality yellow-and-white surface (fingerprints), yellow-and-white clay, embossed band in the lower part of the bowl – plant and animal motif (dove and olive branch).
dhlv: 32 mm, mmØ: 18 mm, pØ: 7 x 6 mm, pv: 5 mm, tØ: 9 mm, oØ: 3 mm.
Found: boundary of monastery garden level and barracks level.
Dating: 2nd half of 17th century.

Z05-014 (b. no. 245, NPÚ)
Small fragment of bowl with preserved rim, stained yellow-and-white surface (polished), inner sooting, wheel-pressed decoration 1 mm under upper rim – band of small rectangles.
dhlv: 23 mm, mØ: 19 mm (estimate).
Found: lower part of monastery garden level.
Dating: 18th century.

Z06-015 (b. no. 393, NPÚ, *fig. 5: l*; *fig. 12: d*)
Bowl with heel without preserved rim and part of stem, light to dark grey surface (numerous fingerprints), marked inner sooting, embossed band in the lower part bowl – geometric pattern.
dhlv: 33 mm, hØ: 17 mm (probably), mØ: 19 mm, uht: 130°, pØ: 6 x 7 mm, pv: 3 mm, td: 63 mm, tØ: 9 and 11 mm, oØ: 3 mm.
Found: layer above pit ending around middle of 17th century.
Dating: 2nd half of 17th century.

ZA05-001 (b. no. 5948, NPÚ, *fig. 15: b*)
Bowl with heel (knocked off) with preserved rim, light whitish-grey, good surface finish (smoothed), wheel-pressed decoration under the upper rim – band of small triangles.
dhlv: 32 mm, hØ: 18 mm, mØ: 18 mm.
Found: upper layer of barracks level.
Dating: around 1680-1710.

ZA07-001 (b. no. 6151, NPÚ, *fig. 5: g*; *fig. 10: a*)
Small fragment of bowl with preserved rim, greyish-white surface and clay, relief on the bowl in the form of a head (face with ear) – Sir Raleigh type, inner sooting.
dhlv: 22 mm, mØ: > 14 mm.
Found: upper layer of barracks level.
Dating: 1st half of 17th century.

ZB06-001 (b. no. 5918, NPÚ, *fig. 15: l*)
Bowl with heel, quality white surface (polished), white clay, wheel-pressed decoration under the upper rim – band of small triangles.
hlv: 46 mm, hØ: 21 mm, mØ: 23 mm, uht: 135°, pØ: 5 mm (four-fifths preserved), pv: 5 mm, 8: letter S.
Found: lower part of monastery garden level.
Dating: end of 18th century – beginning of 19th century.

Decorated stems:

B06-010 (b. no. 6950, NPÚ, *fig. 19: a*)
Fragment of stem, quality surface, numerous decorations – twisted spiral with wheel-pressed decoration in the form of small rectangles, band of relief crosses.
td: 31 mm, tØ: 7 mm, oØ: 3 mm.
Found: infilling of the pit V1924 under monastery garden level.
Dating: 18th century.

D18-002 (AP)
Fragment of stem with traces of green glaze.
td: 40 mm, tØ: 11 mm.
Found: infilling of Early Modern pit over monastery garden level.
Dating: 2nd half of 17th century (?).

E18-001 (AP)
Fragment of stem – mouthpiece, quality surface.
td: 40 mm, tØ: 7.5 mm, nØ: 7 mm, oØ: 2 and 3.5 mm (by mouthpiece).
Found: Early Modern backfill above monastery garden level.
Dating: 18th century.

G12-100 (b. no. 2, AB)
Fragment of stem, decoration – two parallel grooves 3 mm apart.
td: 30 mm, tØ: 10 x 9 mm, oØ: 2 mm.
Found: Early Modern backfill at barracks level (above monastery garden).
Dating: 17th-18th century.

G14-3263 (b. no. 216, AB)
Fragment of stem, quality surface, decoration – fragment of a band of beads with a diameter of 2 mm on one rim.
td: 43 mm, tØ: 6 mm, oØ: 2 mm.
Found: monastery garden level.
Dating: 18th century.

G15-3269 (AB, *fig. 19: c*)
Fragment of stem, decoration – screw line – band with a width of 1 mm and gaps of 5 mm, marked seam.
td: 45 mm, tØ: 9 and 8 mm, oØ: 3 mm.
Found: monastery garden level.
Dating: 18th century.

G15-3273a (AB, *fig. 13: i*)
Fragment of stem, stemps – polygonal (eight-sided) with dimensions of 14 x 8 mm (figure with trident on a ship?), six-sided (arm with sword).
td: 47 mm, tØ: 9 and 8 mm, oØ: 3 x 2 and 3 mm.
Found: monastery garden level.
Dating: turn of 17th/18th century (?).

G15-3273b (AB, *fig. 13: d*)
Fragment of stem, decoration – plant motif, marked seam.
td: 28 mm, tØ: 10 x 8.5 mm, oØ: 3 mm.
Found: monastery garden level.
Dating: 17th century.

G15-3273c (AB, *fig. 5: h*; *fig. 10: c*)
Fragment of with heel, decoration – "Sir Raleigh" motif (head of a crocodile eating a person).
td: 45 mm, tØ: 10 mm, oØ: 3 mm, pØ: 10 x 8.5 mm.
Found: monastery garden level.
Dating: 2nd half of 17th century.

G16-110a (b. no. 56, AB, *fig. 5: s*; *fig. 14: b*)
Small fragment of lower part of bowl with heel and part of stem, quality surface (polished).
pØ: 5 mm, pv: 4 mm, td: 33 mm, tØ: 6 x 6.5 mm, oØ: 2 mm, 8: crowned H.
Found: monastery garden level.
Dating: 18th century.

G16-110b (b. no. 56, AB, *fig. 19: b*)
Fragment of stem, quality polished surface, decoration – bands of triangles.
td: 25 mm, tØ: 7 mm, oØ: 2 mm.
Found: monastery garden level.
Dating: 18th century.

J05-003 (b. no. 7991, NPÚ, *fig. 19: e*)
Fragment of stem, alternately pressed with fingers (fingerprints).
td: 30 mm, tØ: 10 x 7 and 9 x 8 mm, oØ: 4 x 3 mm.
Found: layer above the monastery garden level.
Dating: 17th century (?).

K21-002b (AP, *fig. 19: n*)
Fragment of stem, decoration – fleur-de-lys in a diamond, light grey, relatively good surface.
td: 31 mm, tØ: 9 mm, oØ: 3 mm.
Found: Early Modern backfill above the monastery garden level.
Dating: around 1620-1660.

L09-001 (b. no. 4217, NPÚ, *fig. 19: o*)
Fragment of stem, not very high-quality surface, decoration – 4 fleur-de-lys in a diamond (8 x 7 mm), field with 3 diamonds divided by zigzag from the last field.
td: 35 mm, tØ: 9 mm, oØ: 2.5 mm.
Found: infilling of trench for foundation walls for barracks stables (building H).
Dating: around 1620-1660.

N35-014c (AP, *fig. 19: g*)
Fragment of stem, not very high-quality surface, decoration – cut bands of small triangles and rectangles.
td: 57 mm, tØ: 11 x 10 mm, oØ: 3 mm.
Found: infilling of monastery and barracks pit.
Dating: 18th century.

O15-2109 (b. no. 153, AB, *fig. 19: p*)
Fragment of stem by bowl, not very high-quality surface, decoration – oval stemps in the form of a leaf.
td: 40 mm, tØ: 10 x 11 and 10.5 x 13 mm, oØ: 3 x 2 and 1 mm.
Found: monastery garden level.
Dating: 17th/18th century.

P24-044 (AP, *fig. 13: n*)
Fragment of stem with mouthpiece, bent.
td: 103 mm, tØ: 7 mm, oØ: 2 mm, nØ: 5 x 6 mm.
Found: infilling of recent pit.
Dating: 18th century (?).

R38-026 (AP)
Fragment of stem with mouthpiece.
td: 34 mm, tØ: 7.5 x 6.5 mm, nØ: 6.5 x 5 mm, oØ: 2 and 3 mm.
Found: infilling of trench for foundation wall of main barracks building (middle of the 19th century).
Dating: 18th century (?).

T07-024 (b. no. 2927, NPÚ)
Fragment of stem with mouthpiece, ending at a simple cut, light brown stains on the surface.
td: 47 mm, tØ: 8 mm, nØ: 6 mm, oØ: 2 mm.
Found: infilling of the pit V565 under the monastery garden level.
Dating: 18th century (?).

T11-167 (b. no. 433, AB, *fig. 13: e*)
Fragment of stem, negligently done seams, decoration – plant motif.
td: 51 mm, tØ: 10 x 9 mm, oØ: 2.5 x 3 mm.
Found: monastery garden level.
Dating: 17th century.

T19-004 (AP)
Four fragments of the stem from one piece (?), fragment of the bowl with green glaze.
td: 57 mm, 47 mm, 28 mm, 23 mm, tØ: 9 mm, 9 x 7 mm, 6 mm, 6 x 5 mm, oØ: 2 mm.
Found: Early Modern backfill above the monastery garden level.
Dating: 2nd half of the 17th century (?).

T19-021b (AP)
Two fragments of the stem of one piece, several stains on the green glaze.
td: 63 mm, tØ: 7 and 5 mm, oØ: 2 mm.
Dating: 2nd half of the 17th century (?).

T19-032 (AP)
Fragment of stem, green glaze.
td: 23 mm, tØ: 12 x 9 and 9 x 9 mm, oØ: 2 mm.
Dating: 2nd half of the 17th century (?).

T20-010 (AP)
Fragment of stem, decoration – bands of small rectangles and torso of an illegible inscription.
td: 35 mm, tØ: 8 x 7 mm, oØ: 2,5 mm.
Dating: 18th century.

U05-002 (b. no. 5590, NPÚ, *fig. 5: i*; *fig. 10: b*)
Fragment of stem by the bowl, very marked seams, light to medium grey clay, decoration – plant motif (or Sir Raleigh?).
td: 41 mm, tØ: 10 x 9 mm and 18 x 14 mm (by the head), oØ: 2 mm.
Found: surface of monastery garden level.
Dating: 1st half of 17th century (?).

U07-003 (b. no. 1646, NPÚ, *fig. 13: f*)
Fragment of stem, very high-quality surface (polished), decoration – writing G.A.ROD (?).
td: 32 mm, tØ: 7 mm, oØ: 2,5 mm.
Found: surface of the monastery garden level.
Dating: 2nd half of the 18th century.

U12-147 (b. no. 75, AB, *fig. 19: h*)
Fragment of stem, yellow and white surface, decoration – bands of small triangles and beads.
td: 33 mm, tØ: 7.5 x 7 and 8 mm, oØ: 2 mm.
Found: filling of trench for foundation wall for barracks stables (building H).
Dating: 18th century.

U16-152 (b. no. 42, AB)
Fragment of stem with small fragment of heel, white, negligently finished surface (unpolished, nicks).
td: 42 mm, tØ: 10 mm, oØ: 2.5 mm, pØ: 9 mm, 8: unidentifiable.
Found: monastery garden level.
Dating: 18th century (?).

U20-013 (AP, *fig. 13: l*)
Fragment of stem, bent, not very high-quality surface.
td: 54 mm, tØ: 9 x 8 mm, oØ: 2 mm.
Found: infilling of trench for foundation wall for barracks stables (building H).
Dating: 18th century (?).

U21-018 (AP)
Fragment of stem, bent, not very high-quality surface.
td: 43 mm, tØ: 8 mm, oØ: 2 mm.
Found: infilling of trench for foundation wall for barracks stables (building H).
Dating: 18th century (?).

V06-028 (b. no. 4041, NPÚ, *fig. 13: m*)
Fragment of stem with mouthpiece, negligently finished surface.
td: 92 mm, tØ: 7, nØ-5 mm, oØ: 3 mm.
Found: infilling of the pit V892-V662-V599 under the monastery garden level.
Dating: 18th century (?).

V07-007 (b. no. 1585, NPÚ, *fig. 13: j*)
Fragment of stem, negligently finished surface, mark – eight-sided crest (?) 11 x 8 mm.
td: 56 mm, tØ: 10 mm, oØ: 2 mm.
Found: infilling of the pit V335, probably barracks level.
Dating: turn of 17th/18th century (?).

V09-004 (b. no. 1316, NPÚ, *fig. 13: k*)
Fragment of stem with heel, partial light green glaze.
td: 37 mm, tØ: 9 x 10 mm, oØ: 3 mm, pØ: 7 x 5.5 mm.
Found: boundary between monastery garden level and barracks level.
Dating: 2nd half of 17th century.

V16-110 (b. no. 353, AB)
Fragment of stem, decoration – bands of triangles.
td: 25 mm, tØ: 7 mm, oØ: 2 mm.
Found: monastery garden level.
Dating: 18th century.

V17-110 (b. no. 187, AB)
Fragment of stem, very badly preserved decoration.
td: 32 mm, tØ: 7 x 6.5 mm, oØ: 2 mm.
Found: monastery garden level.
Dating: 18th century (?).

W16-100 (b. no. 52, AB, *fig. 13: a*)
Fragment of stem, negligently finished surface (nicks, fingerprints), decoration – two completely and one half-preserved mark in the form of plant leaves (9 x 5.5 mm).
td: 46.5 mm, tØ: 10 mm, oØ: 2.5 x 3 a 2 x 3 mm.
Found: Early Modern backfill above the monastery garden level.
Dating: 17th/18th century.

W20-007 (AP)
Fragment of stem, whitish-grey speckled surface, decoration – engraved parallel lines with gaps of 3-4 mm.
td: 54 mm, tØ: 6 and 8 mm, oØ: 3 x 2 mm.
Dating: 18th century.

X03-003 (b. no. 865, NPÚ)
Fragment of stem, poorly finished greyish black surface, dark grey clay, almost imperceptible decoration – bands of triangles and beads on one of the rims.
td: 51 mm.
Found: surface of monastery garden level.
Dating: 18th century.

X04-007 (b. no. 539, NPÚ, *fig. 19: i*)
Fragment of stem, negligently finished surface with light brown stains, torso of decoration – bands of triangles and crosses.
td: 34 mm, tØ: 9 and 9.5 x 10 mm, oØ: 2 mm.
Found: layer under the monastery garden level.
Dating: 18th century.

X05-005 (b. no. 414, NPÚ)
Fragment of stem, light green glaze.
td: 16 mm, tØ: 10 x 9 mm, oØ: 2.5 x 4 mm.
Found: monastery garden level.
Dating: 2nd half of 17th century (?).

X06-021 (b. no. 4332, NPÚ, *fig. 13: b*)
Fragment of stem by bowl, decoration – marks with motif of leaves with ribbing.
td: 25 mm, tØ: 13 x 11 mm (by the bowl) and 1 mm, oØ: 2 x 1 and 3.5 x 3 mm.
Found: layer under monastery garden level.
Dating: 17th/18th century.

X10-005 (b. no. 5732, NPÚ, *fig. 19: k*)
Fragment of stem, not very high-quality surface, decoration – fleur-de-lys in diamonds twice (11 x 8 mm).
td: 43 mm, tØ: 10 x 9 and 10 mm, oØ: 3 mm.
Found: infilling of the pit V1491 – probably barracks level.
Dating: around 1620-1660.

X22-001 (AP)
Fragment of stem with heel, light to medium-green speckled glaze.
td: 40 mm, tØ: 13 x 10 and 10 x 9 mm, oØ: 2 x 1 and 3 x 2 mm, pØ: 7 mm, pv: 4 mm.
Found: Early Modern backfill above monastery garden level.
Dating: 2nd half of 17th century.

Y03-011b (b. no. 386, NPÚ, *fig. 13: g*)
Fragment of stem by heel, negligently finished surface, decoration – letters ES in a circular mark with a diameter of 5 mm (letter size 4 mm).
td: 34 mm, tØ: 10 x 11 and 10 x 14 mm, oØ: 3.5 x 2 mm.
Found: layer under monastery garden level.
Dating: 17th century (?).

Y05-006b (b. no. 233b, NPÚ)
Fragment of stem, decoration – bands of small triangles.
td: 39 mm, tØ: 7 x 6.5 and 8.5 x 7.5 mm, oØ: 2 mm.
Found: monastery garden level.
Dating: 18th century.

Y05-007c (b. no. 295, NPÚ)
Fragment of stem, quality surface, hard-fired clay by the hole, torso of decoration – bands of small triangles.
td: 17 mm, tØ: 10 x 11 mm, oØ: 2 mm.
Found: monastery garden level.
Dating: 18th century.

Y07-003 (b. no. 1580, NPÚ, *fig. 19: f*)
Fragment of stem, decoration – bands of triangles.
td: 38 mm, tØ: 8 mm, oØ: 2 and 2 x 3 mm.
Found: monastery garden level.
Dating: 18th century.

Y07-005 (b. no. 1529, NPÚ)
Fragment of stem, very high-quality surface (polished), torso of decoration – small squares.
td: 17 mm, tØ: 11 mm, oØ: 3 mm.
Found: infilling of trench for foundation wall of stables for sick horses – barracks level.
Dating: 18th century.

Y07-007 (b. no. 507, NPÚ)
Fragment of stem, relatively carefully finished surface (smoothed), torso of decoration by the rim – bands of small triangles and crosses.
td: 23 mm, tØ: 10 and 11 mm, oØ: 2 x 3 mm.
Found: layer under the monastery garden level.
Dating: 18th century.

Y07-013 (b. no. 1580, NPÚ)
Fragment of stem, decoration – bands of triangles.
td: 38 mm, tØ: 8 mm, oØ: 2 and 2 x 3 mm.
Found: layer under the monastery garden level.
Dating: 18th century.

Y09-001b (b. no. 411, NPÚ, *fig. 19: r*)
Fragment of stem, mark – three-leafed flower (fleur-de-lys?) in a circle with a diameter of 8 mm.
td: 30 mm, tØ: 11 mm, oØ: 3 mm.
Found: backfill at barracks level.
Dating: 17th century (?).

Y10-069 (b. no. 6532, NPÚ, *fig. 19: m*)
Fragment of stem, slightly bowed, grey-and-white speckled, sloppy surface, evident lower seam, decoration – fleur-de-lis in a diamond (three under each other, 11 x 7.5 mm).
td: 73 mm, tØ: 10 x 10.5 mm and 9 mm, oØ: 2.5 mm.
Found: infilling of the pit V1491 – probably barracks level.
Dating: around 1620-1660.

Y31-048b (AP, *fig. 13: h*)
Fragment of stem, quality surface (smoothed), decoration – bands of small triangles, word GOUDA (?), font size 2.5 mm.
td: 40 mm, tØ: 7 x 6 mm, oØ: 2 mm.
Dating: 18th century.

Z04-007 (b. no. 159, NPÚ, *fig. 19: c*)
Fragment of stem, smoothed surface, markedly dirtied small dark stains, decoration – bands of small triangles and rectangles.
td: 29 mm, tØ: 7 and 7.5 mm, oØ: 2 mm.
Found: backfill at barracks level.
Dating: 18th century.

Z04-011 (b. no. 350, NPÚ, *fig. 13: c*)
Fragment of stem, decoration – plant motif (berries and fleur-de-lis, ending at an engraved line), very marked seam.
td: 30 mm, tØ: 11 and 10.5 mm, oØ: 3 and 2 mm.
Found: layer under the monastery garden level.
Dating: 17th century.

Z05-002 (b. no. 110, NPÚ, *fig. 15: g*)
Fragment of stem, very dirty brown-and-grey surface, decoration – bands of small triangles and beads.
td: 42 mm, tØ: 7 x 8 and 8.5 x 9 mm, oØ: 3 mm.
Found: boundary between monastery garden level and barracks layer.
Dating: 18th century.

Z05-009b (b. no. 201, NPÚ, *fig. 5: t*; *fig. 14: e*)
Fragment of stem with heel (three-quarters preserved), carefully done surface (polished), torso of decoration – bands of small triangles, spur.
td: 50 mm, tØ: 8 mm, oØ: 2.5 mm, pØ: 6 mm, 8: letter H (crowned?).
Found: probably barracks level.
Dating: 18th century.

Z06-001 (b. no. 2373, NPÚ, *fig. 19: j*)
Fragment of stem, relatively high-quality surface, decoration – bands of small triangles and crosses.
td: 31 mm, tØ: 11 and 12.5 mm, oØ: 2 mm.
Found: upper layer of barracks level.
Dating: 18th century.

Z06-009 (b. no. 241, NPÚ)
Fragment of stem, relatively high-quality surface with a marked seam, very poorly preserved decoration – band of beads.
td: 43.5 mm, tØ: 8 x 7 mm, oØ: 2 mm.
Found: monastery garden level.
Dating: 18th century.

Z06-050 (b. no. 1178, NPÚ)
Fragment of stem, partially light green glaze.
td: 22 mm, tØ: 9 x 8 mm, oØ: 2 mm.
Found: building destruction – house facilities (17th – 18th century).
Dating: 2nd half of the 17th century (?).

Z07-013 (b. no. 4618, NPÚ, *fig. 19: l*)
Fragment of stem, decoration – three fleur-de-lis in a diamond (11 x 8 mm).
td: 50 mm, tØ: 11 x 10 and 10 mm, oØ: 2 mm.
Found: layer under the monastery garden level.
Dating: around 1620-1660.

Z08-017 (b. no. 1051, NPÚ, *fig. 19: d*)
Fragment of stem, surface with light brown stains, very marked seam, decoration – plant motif and beads (bead diameter: 1.5 mm).
td: 36 mm, tØ: 9.5 and 10 x 11 mm, oØ: 2 mm.
Found: layer under the monastery garden level.
Dating: 17th century.

Z28-017 (AP, *fig. 15: m*)
Fragment of stem with part of heel, brown surface.
td: 88 mm, tØ: 11 x 10 (by the heel) and 9 mm, oØ: 3 x 2 mm, 8: parallel lines.
Found: infilling of Early Modern well Z28-011 (course of 17th – 19th century).
Dating: ?

ZA07-071 (b. no. 7081, NPÚ, *fig. 15: n*)
Fragment of stem with part of heel, surface is not of a very high quality.
td: 32.5 mm, tØ: 10 and 11 x 12.5 mm (by the spur), oØ: 2.5 mm, pØ: 10 mm, 8: flower (Tudor rose?) in the profile band.
Found: upper layer of barracks level.
Dating: 17th century (?).

Resumé:

V letech 2003-2005 proběhla hlavní sezóna předstihového archeologického výzkumu v areálu bývalých kasáren Jiřího z Poděbrad na náměstí Republiky na Novém Městě pražském (*obr. 1*). Tento rozsáhlý plošný odkryv (1,5 ha) při hranici se Starým Městem přinesl mimo jiné i početné nálezy keramických a porcelánových dýmek v celkové množství 668 kusů (*obr. 4*). Zlomky dýmek patří k nejmladšímu nálezovému horizontu na ploše výzkumu (17.-20. století). Počátek 2. třetiny 17. století představoval radikální změnu v celé ploše zkoumaného pozemku. Roku 1630 byl v západní části plochy založen kapucínský klášter, jemuž padla za oběť starší zástavba nejen do náměstí Republiky, ale i do ulic Truhlářské a Na poříčí. Na větší části pozemku pak vznikla rozsáhlá klášterní zahrada (*obr. 3*). Po zrušení konventu Josefem II. byly budovy kláštera od roku 1794 využívány armádou, a to částečně až do výstavby nové budovy kasáren (po polovině 19. st.), která tvoří dodnes průčelí do náměstí Republiky.

Příspěvek se detailněji zabývá jednodílnými keramickými dýmkami tzv. holandského (anglického) typu, tedy těmi, kde hlavička dýmky tvoří s troubelí jeden celek (byly nalezeny v počtu 32 kusů hlaviček a 231 zlomků troubelí). Jeho první část se věnuje několika základním údajům o tomto typu dýmek – výrobnímu procesu, problematice evropské produkce a také prvnímu výskytu tabáku v Čechách. Druhá část příspěvku je pak věnována rozboru jednotlivých nálezů z výzkumu a jejich zasazení do kontextu evropské produkce.

Díky rozvíjejícímu se zájmu archeologů o tento druh artefaktů (od 70. let minulého století – zprvu především v Anglii, později v Holandsku, Německu a Polsku) došlo k podchycení základního morfologického vývoje dýmek od počátku 17. do 20. století. Na základě terénních archeologických odkryvů a detailních rešerší písemných pramenů dochází k rozboru produkce jednotlivých výrobních center, celoevropské distribuce i k řešení otázek užívání tabáku v jeho sociálně-ekonomickém kontextu. Pro oblast kontinentální Evropy mají největší význam výrobky holandské, a to zejména z města Gouda, která se od poloviny 17. do poloviny 18. století stala bezkonkurenčním produkčním centrem, které doslova zahltilo zbytek Evropy svými kvalitními výrobky. Tato produkce udávala směr v tvarosloví a výzdobě dýmek a byla předmětem nápodoby a falzifikátorství ostatních dílen v Holandsku, Belgii, Německu a dalších zemích. Po roce 1750 začal význam Goudy upadat a docházelo k rozvoji četných manufaktur především v Německu a Polsku.

Písemné prameny v českých zemích zaznamenávají první zmínky o tabáku v závěru 16. a na počátku 17. století, ale v těchto případech se jedná o použití tabáku jako léčivé byliny. Okolo poloviny 17. století jsou v písemných pramenech zmiňovány nejen první dýmky, ale i první zákazy kouření tabáku „pro nebezpečí ohně", svědčící o rychlém šíření tohoto zvyku.

Nejstarší horizont nalezených zlomků dýmek z 1. a 2. třetiny 17. století (*obr. 5-11*) zahrnuje drobné dýmky s víceméně hladkým povrchem hlavičky o velikosti do 3 cm a s vnitřním objemem okolo 1 cm^3. Tvar hlavičky je většinou dvoukónický, tj. s nejvyšším průměrem ve střední části hlavičky a zúžením při horním okraji. Zvláštní kategorii ve výzdobě představují dýmky s bohatým rostlinným dekorem pokrývajícím celou dýmku, které jsou v našich nálezech zastoupeny pouze třemi zlomky troubelí (*obr. 13*) a dýmky typu Sir Walter Raleigh s hlavičkou v podobě mužské hlavy, kterou pohlcuje krokodýl (ryba).

Ke specifické produkci 2. poloviny 17. století náleží dýmky, které se často objevují v nálezech na území středního a severního Německa, Polska a u nás. Během výzkumu bylo nalezeno celkem 11 zlomků těchto dýmek (z toho 5 zlomků hlaviček – *obr. 5, 12*). U hlaviček těchto dýmek respektuje jejich maximální průměr i průměr při horním okraji – tj. stěny jsou víceméně rovnoběžné. Výzdoba se vyskytuje zejména ve formě širšího pásku s plastickou výzdobou s různými motivy. Dýmky se vyskytují v glazované (zelená, zelenožlutá glazura) i neglazované podobě a poměrně charakteristická je pro ně nepříliš vysoká kvalita zpracování i keramického materiálu.

Jedním z důležitých faktorů určování dýmek jsou také jejich značky na patkách (*obr. 20*), které v mnoha případech umožňují identifikaci místa výroby, případně přímo výrobce. Nejvíce zastoupenou značkou v našich nálezech bylo korunované písmeno H, a to celkem 6 exempláři (*obr. 5, 14*). Značka je ztvárněna v různých variantách, což ukazuje na různá místa výroby, a to nejen v Goudě, ale i v jiných centrech, kde byla značka písmene H používána (Francie, Belgie, jiné holandské dílny). Mezi další značky nalezené během výzkumu a datované do přelomu 17. a 18. století, případně průběhu 18. století, patří značka trojramenného svícnu nebo postavy se dvěma vědry (dojička mléka). Obě dýmky pocházejí z goudských dílen (*obr. 15, 16*).

Celkem pět exemplářů dýmek představuje typ s plastickým žebrováním ve spodní třetině hlavičky (*obr. 15, 17*). Tyto dýmky o výšce hlavičky mezi 4 a 5 centimetry a vnitřním objemem přes 4 cm^3 se vyskytují ve formě dýmek s patkou

i bez patky a bývají datovány do 2. poloviny 18 století. Jsou poměrně četné ve středoevropských nálezech. Jako místo původu jsou nejčastěji uváděny dílny v Německu a Polsku.

V polovině 18. století nastupuje výrazná produkce pruských dílen, přetrvávající až do průběhu 19. století. K nejvýznamnějším a nejlépe dokumentovaným patří dílny ve Sborovském (Zborowskie) a Rostine (Rościn) na území současného Polska. Dýmky z těchto dílen se v našich nálezech vyskytují po jednom exempláři (*obr. 15, 18*). Obě dílny velmi intenzivně využívaly věhlasu výrobků z Goudy, a to formou četných kopií značek z těchto dílen na svých výrobcích.

Z celkového počtu 231 nalezených zlomků troubelí bylo pouze 64 ks nějakým způsobem zdobeno, a ty jsou také zařazeny v katalogu. Troubele dosahovaly velmi rozdílných délek od deseti do několika desítek centimetrů (na výzkumu nalezené zlomky dosahují cca 2 až 7 cm). Rámcově lze konstatovat, že troubele většího průměru a hruběji zpracované náleží do staršího časového horizontu 17. století. Výzdoba určitého typu se na troubelích vyskytuje většinou v delších časových úsecích a škála výzdobných motivů je velmi rozmanitá. Četná je radélková výzdoba pásky trojúhelníčků, čtverečků, křížků nebo perlovce (*obr. 19*), výzdoba vtlačovanými kolky – lilie v kosočtverečném poli, nebo kolky v podobě listů. Specifickou výzdobu tvoří nápisy, které mohou přispět k bližší identifikaci místa výroby. V našich nálezech jsou to nápisy GOUDA, G.A.ROD a písmena ES (*obr. 13*).

Dýmky z náměstí Republiky představují nálezově bohaté spektrum, které odpovídá středoevropské poloze naší metropole jako obchodní a kulturní křižovatky.

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The first line of defence of Andělská Hora Castle

Prvá linie opevnění hradu Andělská Hora

Die erste Befestigungslinie der Burg Andělská Hora

Tomáš Durdík

Dieser Beitrag behandelt die erste Befestigungslinie der Burg Andělská Hora, die für die Verteidigung mit Feuerwaffen vorgesehen war und in zwei Bauphasen an der Wende vom Mittelalter zur Neuzeit errichtet wurde. Die Burg Andělská hora befindet sich auf einem ausgeprägten steilen Felsvorsprung, in den sowohl der Zugangsweg als auch der schmale Streifen der ersten Befestigungslinie gehauen war. Letztere bestand aus einer vom Tor auslaufenden gebrochenen Mauerlinie, die mit Schießscharten versehen und durch eine kleine halbkreisförmige Bastei abgeschlossen war. Die Herrichtung des eigentlichen Tores, vor allem der große Bogen, stammt erst aus der Barockzeit. Die Befestigung von Andělská Hora führt zu der aus methodischer Sicht interessanten Feststellungen und stellt ein ausgezeichnetes Beispiel für die Nutzung eines einzigartigen geomorphologischen Gebildes und ihre Stellung im Rahmen der damals errichteten Burgen einzigartig ist. Es handelt sich damit um ein einzigartiges, zweifellos sehr bedeutendes Denkmal.

Given the role that they played in the development of the Czech Lands, fortifications from the transition period between the Late Middle Ages and the Early Modern period are, somewhat surprisingly, under-represented in terms of the research into the fortified sites of this country. This is true even of key locations that, whilst certainly not insignificant, have received scant attention from either Czech or European scholarship, and where detailed study yields new information and attempts at interpretation of fundamental value, both changing earlier views and provoking discussion that should lead to accurate classification and evaluation - classic examples of this being the fortifications of Rabí Castle (*Varhaník 2005*; *Varhaník – Krušinová – Kyncl – Kyncl 2005*) and Kunětická Hora (*Šeda 2003*; *Noll – Varhaník 2004*). Reliable and detailed evidence is doubly absent from common and less complex cases. The literature commonly labours under axioms, interpretations and chronological schemes created by earlier scholarship (e. g. *D. Menclová 1976*), as well as those of varying quality created and in particular forcibly promoted in the present, the relationship of which to reality has not been securely established, and which understandably might be misleading. In such circumstances, every detailed survey provides essential contribution and is absolutely necessary.

The castle of Andělská hora is one of the very few studies of large ruins with Late Gothic defences using firearms (for an overview of the literature see *Durdík 1999*; *2002*; *2005a*; *2005b*). Its defensive system has not been studied and evaluated in detail within the framework of the general processing undertaken to date (see most recently *Menclová 1976*; *Ryšavý 1994*). A change came only with the onset of the gradual processing of the structural historical survey of the castle demanded by a need for repairs. The first processed section (*Durdík 2005b*) was the access route and the first line of defence, this being the subject of this article.

Fig. 1. Andělská Hora. Aerial view from the west. *Photo: K. Kuča.*
Obr. 1. Andělská Hora. Letecký pohled od západu. *Foto K. Kuča.*

The castle was established on a conspicuous, isolated landscape feature – a clinkstone rock affording a broad view across the surrounding landscape (*fig. 1*). To the south, west and east the terrain comprises a very steep, inaccessible rock formation; only to the north is there for the most part a steep slope. On the southern side, a township abutted the castle rock that is believed to have been fortified in the Middle Ages and Early Modern period (on the township see most recently *Kuča 1996*).

The history of the castle has been considered in most detail by *F. Bernau* (*1903*) and *A. Sedláček* (*1937*); unless otherwise stated, the historical data given below come from these sources, as a modern archival investigation into the castle's history is still awaited.

The castle is first mentioned in 1402, in an appellation of Boreš, Count of Osek. From 1406 it belonged to Oldřich Zajíc of Házmburk, after whose death in 1414 it fell to the king. After the Hussite Wars it was from 1430 the property of Jakoubek of Vřesovice, from whom it passed in 1437 to the Šlik family, under whose ownership it must have been repaired. Further renovations came in the 1460s under Zbyněk Zajíc of Házmburk, and at the end of the century under the lords of Plavno – to whom it had belonged since 1466. In 1468 it was captured by forces loyal to the king. From 1567 onwards it changed hands repeatedly, ceasing to be a residential seat during the 17th century. Having been captured by Swedish forces in 1635 the castle was retained for emergency use only. At the beginning of the 1650s it was restored by Humprecht Jan Černín of Chudenice. It was definitively abandoned after a fire in 1718.

In 1868 the Černín family repaired the access to the castle, visible in the current access with its masonry stair. Further renovations were undertaken by Heřman Černín at the end of the 1880s, stone steps being installed in the access route within the framework of these. In 1898 there is explicit mention of repairs and extensions being made to the ramparts and embrasures, during which cement was applied to the upper surfaces.

Even in the 1950s and 1960s the castle masonry was being removed as material for buildings in the area. Upkeep of the greenery and an unhappy 'cleaning' of the cistern came only in 1992-1993.

The appearance of the castle was to a great extent determined by the character of the marked geomorphological feature on which it stands, and the rectangular shape thereof, running roughly east-west. The disposition of the castle which undoubtedly arose out of a more complex development than has hitherto been assumed (*Menclová 1976*; *Ryšavý 1994*) was bi- or ultimately tri-partite.

The access road to the castle rose from the square of the township on the southern slope. In the space beneath the semi-circular bastion of the first line of masonry defences that forms the subject of this article (*figs. 2, 3*), it rose as a route cut into the rock, winding beneath the fortification line on the western side to the first gate. This was cut through an angle in the ramparts with loopholes, cut into the rock and fortified with a small semi-circular bastion. Along the access road to the second gate, running along the north slope of the rise, the fortifications comprised just a wooden screen.

As noted above, the western side of the castle rock was a steep cliff, into which an artificial platform had to be cut to take the access route, and the first line of defence above it.

The road leading to the first gate is forced by the geomorphological situation on the castle rock to split into two sections. The second, on front of the actual gate and essentially horizontal, or rising very slightly, lies beneath the masonry rampart face between two rocky crests running down from the castle rock. The first, which now comprises mainly a maintained lane with steps and a masonry stair, then rises relatively steeply from the space above the township's church to the edge formed by the termination of the second, beneath the round bastion in the front of the masonry fortifications. In the space along the line of communication, the strikingly vertical edge mentioned above requires that the existence of the first gate be assumed here; this was probably wooden, and wooden fortifications most likely followed the edge of the road as well. The body of what is now the first (but which was probably originally the second) gate – in contrast to the relationship with the wooden fortifications between this and what is now the second gate – bears no traces of its anchoring.

The first masonry line of fortification (*fig. 3*) is, given the geomorphological situation, broken twice, and rises towards the south. The lifting of the greater part of its course above the access

Fig. 2. Andělská Hora. General view of the first line of fortifications at the castle from beneath. *Photo: T. Durdík.*
Obr. 2. Andělská Hora. Celkový pohled na prvou linii opevnění hradu z podhledu. *Foto T. Durdík*

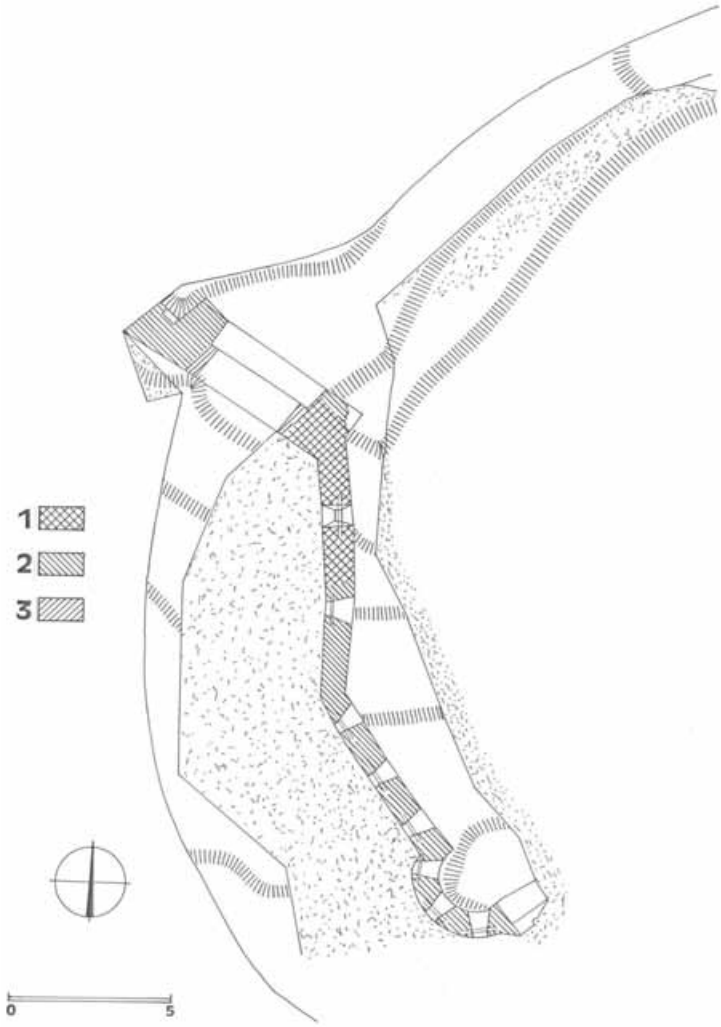


Fig. 3. Andělská Hora. Plan of the fortifications with the first gate. 1 – earlier Late Gothic masonry; 2 – later Late Gothic masonry; 3 – probably Early Baroque masonry. *Drawn by J. Durdíková.*
Obr. 3. Andělská Hora. Půdorys opevnění s prvou branou. 1 – starší pozdně gotické zdivo, 2 – mladší pozdně gotické zdivo, 3 – pravděpodobně raně barokní zdivo. *Kresba J. Durdíková.*

road that runs beneath it to the first gate, is notable. On the north side it is formed by a somewhat stronger, straight section passing through the portal of the first gate, linked to the south by the northern section of the ramparts. Somewhat behind the middle length, the whole line turns, again at an obtuse angle, but in the opposite direction. It continues along the southern ramparts and on the south side comes to an end at a small, semi-circular bastion, open to the inside. The existence of associated fortifications, for example of wood, as included on her plan by *D. Menclová* (*1976; fig. 12*), and which would have risen to the corner of the western palace in the upper part of the castle, is not supported by any evidence from the steep, irregular rock face. The inner face of the entire fortification line is followed by a narrow, outer ward-like gallery cut into the rocky substrate, which rose towards the bastion. Its pedestrian surface, into which the rocky substrate very often extends today, was not smoothed.

The whole line (described in detail in *Durdík 2005b*) was, with the exception of the 19th and 20th century heritage interventions, formed through a complex structural development that comprised at least three building phases.

Fig. 4. Andělská Hora. The outer facing of the earlier stretch of wall, with loophole. *Figs. 4-10 photographed by T. Durdík.*
Obr. 4. Andělská Hora. Vnější líc staršího úseku hradby se střílnou. *Obr. 4-10 foto T. Durdík.*

Fig. 5. Andělská Hora. Loophole in the earlier stretch of wall seen from the inner castle area. Above a general view, on the right side a detail of the reveal with a socket for a beam to which a blunderbuss could be attached.
Obr. 5. Andělská Hora. Střílna ve starším úseku hradby v pohledu z vnitřní plochy hradu. Nahoře celkový pohled, vpravo detail špalety s kapsou trámku pro zaklesnutí hákovnice.

The first phase of building can be read from the lower part of the northern rampart section, with its pockets for scaffolding beams and loophole with reveals on both sides, with beam for securing blunderbusses, and also from part of the southern reveal of the first gate (*figs. 4, 5*). Whether it was in this early period that the rising cut into the rocky slope was created, secured in a later phase by a continuation of the rampart with the semi-circular bastion, is unclear.

This phase, then, created a transverse barrier across the access road, with a coulisse gate of unknown form and associated walls.

The great majority of the structure surviving today comes from the second phase of building, in which the line of fortification attained its present dimensions.

In the case of the walls and bastions it is characterised by simpler, inward flaring loopholes in relatively week walls (*figs. 6, 7, 8*). These again have beams for securing blunderbusses. At the northern gate, of which mainly a vault and part of a passage have survived, the line ended in the face, and on the eastern side a high swallowtail to anchor the associated wooden defences. It is entirely certain that these did not consist of a palisade, as suggested by *V. Ryšavý* (*1994*), and it is not even certain that it comprised stakes, as proposed by *D. Menclová* (*1976*). The wooden rampart structures could easily have been different, e. g. using shuttering. The question as to their nature will be resolved by the future archaeological excavation of the outer edge of the line of communication between the first and second gates.

Fig. 6. Andělská Hora. The inner side of the southern loophole in the northern stretch of wall.
Obr. 6. Andělská Hora. Vnitřní strana jižní střílny severního úseku hradby.

Interesting questions are associated with the appearance of the loopholes in the walls and bastion (*figs. 6, 7*). Today, relatively broad (c. 40 cm), rectangular loopholes open outwards, their edges made from quarried stone. The question thus arises as to whether this is their original state, or whether they were (or were intended to be) set into dressed slabs with keyhole (the existence of which at the castle is documented) or other loopholes. The masonry today

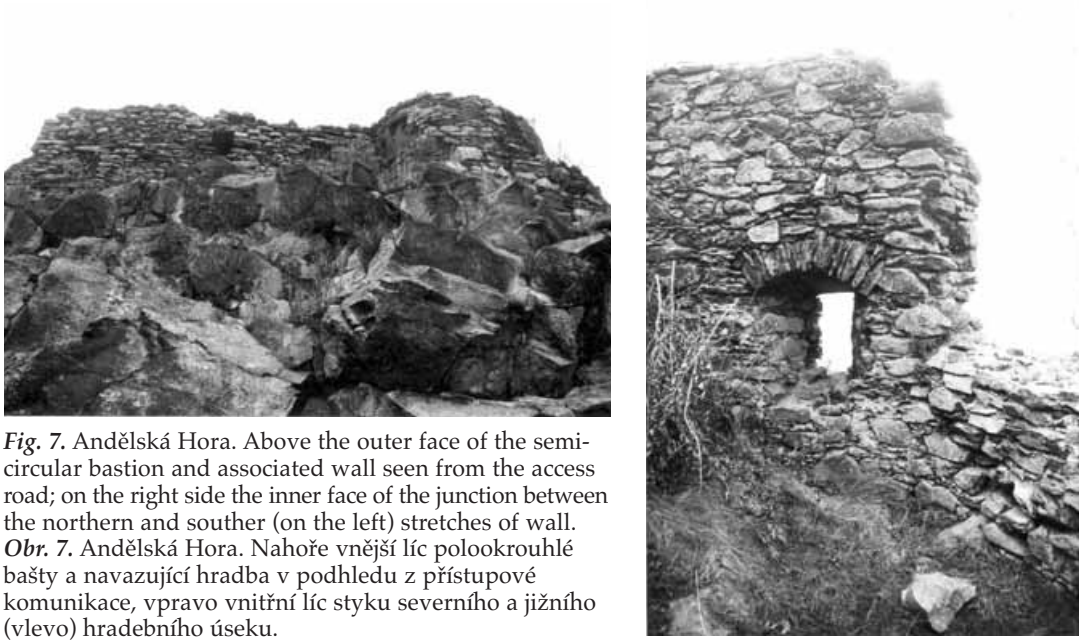


Fig. 7. Andělská Hora. Above the outer face of the semi-circular bastion and associated wall seen from the access road; on the right side the inner face of the junction between the northern and souther (on the left) stretches of wall.
Obr. 7. Andělská Hora. Nahoře vnější líc polookrouhlé bašty a navazující hradba v podhledu z přístupové komunikace, vpravo vnitřní líc styku severního a jižního (vlevo) hradebního úseku.

Fig. 8. Andělská Hora. The inner faces of the southern and northern stretches of wall, seen from the south.
Obr. 8. Andělská Hora. Vnitřní líc jižního a severního hradebního úseku v pohledu od jihu.

contains no visible traces of the placement of such slabs, and the presumption that these were made only to the dimensions of the inner reveals of the loopholes is very unlikely – such a solution would also have been impractical. For these reasons, it is most likely that the surviving state reflects the original situation. Caution is however urged by the fact that we know that within the framework of the renovations made at the end of the 19th century, these same loopholes were repaired and refurbished. A detailed evaluation of the actual extent of the interventions from this period is, in the case of the outer face, almost impossible at a reliable level, although no conspicuous remains of the refurbishment

Fig. 9. Andělská Hora. The first gate seen from the upper plateau of the castle rock.
Obr. 9. Andělská Hora. Prvá brána v pohledu z horního plato hradního návrší.

of the masonry edges of the loopholes are apparent, and their relationship to the associated masonry seems entirely organic.

The present crown of the masonry results from the aforementioned renovations of the 1890s. Whether the weak walls bore a wooden or half-timbered shooting platform cannot be determined on the basis of the knowledge available at present (even the historic iconography contains no support in this sense – *Durdík 2005b*). We may rather presume that this need not have been the case (there are no remains or imprints of such a structure, for example, on the vertical face to the northern terminal super-elevation of the southern stretch of wall). The proximity of the steep, rocky slop and the small breadth of the space carved into it behind the ramparts (*fig. 8*) opens rather the question of whether the whole space might not have been roofed, obviously including the interior of the bastion. The rocky surface, however, bears no traces whatsoever of such as solution having been employed.

A walkway, or defensive superstructure, was carried by the masonry of the broader first gate (*fig. 9*). The weak parapet wall survives today. Special attention should be paid to the two massive, four-sided sockets in the breadth of the masonry of this parapet, at the level of the walkway floor; the existence

of at least one more in the centre must be assumed. Given that in front of the gate there was probably no ditch, these could not have been associated with the management of ropes for a drawbridge, as was for example presumed in a naive, Romantic reconstruction of around the turn of the 20th century (reproduced for example in *Ryšavý 1993*). Evidently it relates to horizontal load-bearing elements from a wooden machicolation structure, or a timbered or half-timbered half-floor or superstructure. We must assume that access was gained via the lost, original centre part of the weaker front wall, at the level of the superstructure.

A greater number of questions are linked to the present large, semi-circular arch portal of the first gate (*fig. 10*). Under no circumstances does this conform to castle portal design from the dawn of the Early Modern period (it has for example excessive dimensions, no trace of any method of closure and securing etc.). It appears that the whole thing (or at least a considerable part of it) appeared during a later, Modern period phase of building, from after the castle's loss of military function. If it were to be taken as part of the original design, we would be obliged to interpret it not as a portal arch, but as a relieving arch, beneath which would have been the actual wall and portal gate. Caution in this direction is urged by the fact that we must, by the main gate, assume the possibility of identifying a bar – no socket for which in the masonry of the reveal is however apparent. The situation of the segmented discharging arch at the rear of the gate area attests, though, that the lower part of the masonry of the present portal could hardly be concealed.

Fig. 10. Andělská Hora. The first gate. Above, the outer face with part of the associated northern stretch of wall; below, the inner face.
Obr. 10. Andělská Hora. Prvá brána. Nahoře vnější líc s částí navazujícího severního hradebního úseku, dole vnitřní líc.

The dating of both of the earliest phases of the facings of the castle's defensive lines is a particularly difficult problem, for which few clues are available. We do not know even how great an interval passed between them, assuming that there was one at all (these could after all be two microphases within a single building phase).

The overall design was very clearly influenced by the geomorphological situation, and thus dating through comparison to analogous fortifications is of little use. The loopholes, with tie beams for blunderbusses, clearly direct us towards the period in which these firearms were in common use, while the double-sided, revealed loopholes might, according to some current views be a later element (unless of course such loopholes were used in the Hussite fortifications of Tábor – *Menclová 1953*; *Varhaník 1997*; *Líbal 1989*. The more straightforward opinion, fiercely advocated recently by J. Varhaník, is that they date to the Renaissance. A need for caution is indicated by the findings of an intensive study of loopholes from the Hussite period in neighbouring Bavaria, which shows the marked diversity of types used in parallel – *Zeune 2006*). It is necessary to emphasise that this "advanced" design is, at Andělská Hora, older than the "more archaic" design. In comparison with the historical

context it is necessary to assume that the surviving structures of this fortification line are unlikely to have appeared before the conquest of the castle in 1468. It seems most likely that they stem from the rebuilding by the Lord of Plavno at the end of the 15th century. Their completion may be assumed to have been no later than during the structural work done in 1519.

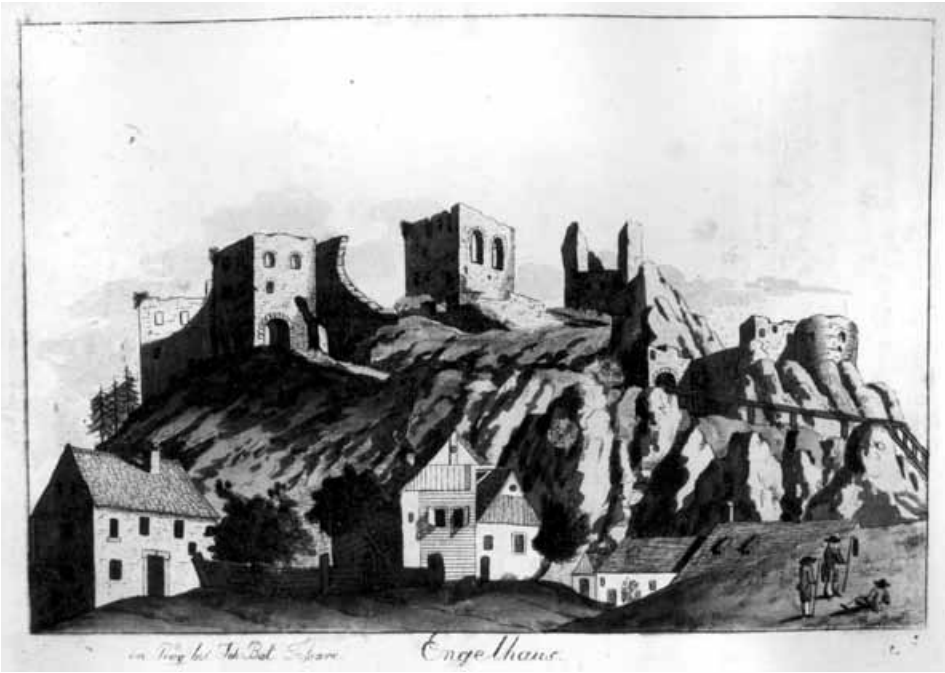


Fig. 11. Andělská Hora. The ruins of the castle in the 1780s-90s on a painting published by J. B. Tessar.
Obr. 11. Andělská Hora. Zříceniny hradu v 80.-90. letech 18. století na vyobrazení vydaném J. B. Tessarem.

Another phase of building can certainly be dated to the later Early Modern period, and evidently to a time after the loss of the castle's significance as a fortification, and therefore of the need to solidly close off access to this line. Within the framework of this phase the entrance portal of the first gate became today's great arch, with a rough plaster visage that is no longer visible on the outer face, but which is well established by iconographic sources (*fig. 11*). The inner space of the gate was also plastered, and remains of this modern plaster have survived as small fragments.

This phase can most probably be read as being part of the Early Baroque, or to the period of repairs following the Thirty Years' War, which took place in the oppressive atmosphere of Emperor Ferdinand III's command regarding the demolition of those fortified castles that might form a buttress for any resistance to the Habsburgs by the Bohemian Estates. Under Humprecht Jan Černín of Chudenice, indeed, it had to explained within the framework of a 1659 investigation that the ongoing structural repairs did not relate to fortification, but were necessary in order that the castle be usable at all, and that as part of this new apertures had been opened up in the older walls (*Ryšavý 1993*). The new design for the first gate, with its large, poorly (if at all) securable entrance arch was most likely a consequence of a compulsory move to demilitarise the castle.

Uniquely, from the defensive point of view, the undeniably highly advantageous site of Andělská Hora Castle heavily influenced the shape and design of its defensive system, in which a key role was played throughout the castle's existence by the impassably steep rocky slopes. For this reason, the fortifications from the dawn of the Early Modern period, with the exception of the small bastion on the first fortification line, do not include any protruding

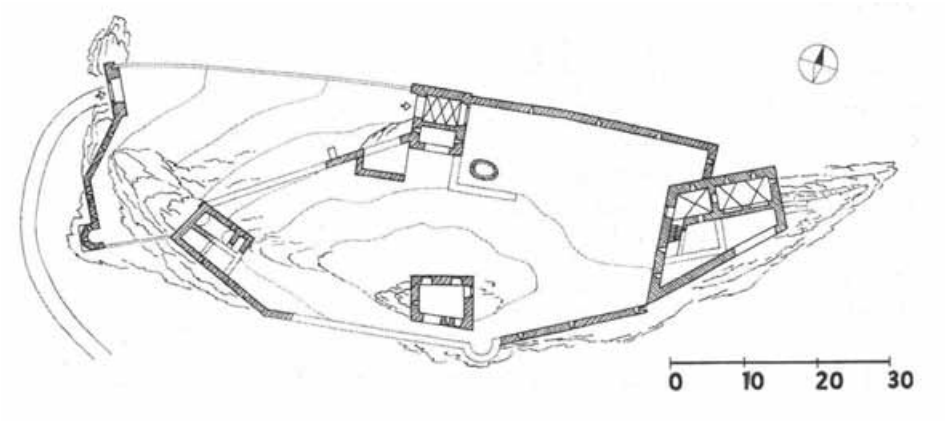


Fig. 12. Andělská Hora. General plan of the castle, *after D. Menclová (1976).*
Obr. 12. Andělská Hora. Celkový půdorys hradu podle *D. Menclové* (*1976*).

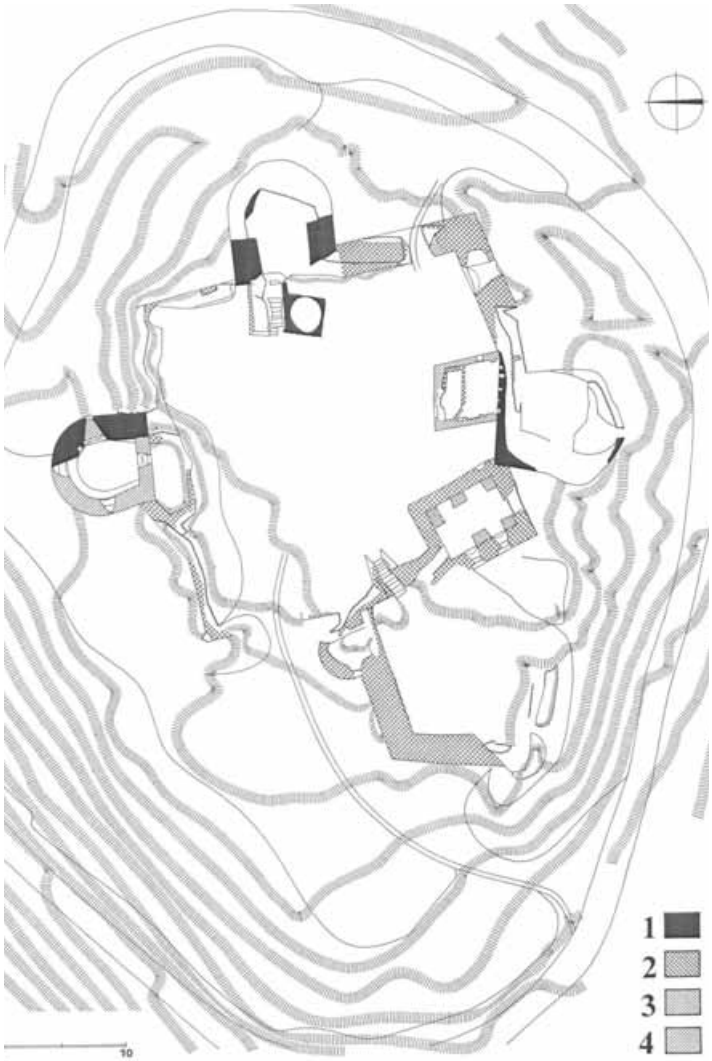
elements (the bastion shown by *D. Menclová – 1976, fig. 12* – on the south side, neighbouring the donjon, probably never existed; no remains are visible in the terrain, and there are no old descriptions, historical iconography or plans to support its presence– see *Durdík 2005b*). This fact, along with our insufficient degree of knowledge, understandably reduces the opportunities available for comparisons with contemporary castle building.

The pregnant geomorphological situation clearly caused problems in designing the communications scheme, and in particular in making possible access to the necessary height of the castle rock. The presumed, great wooden structure of an access ramp, was not unusual in Czech castle architecture (see e. g. *Durdík 1999*). It must be noted here that many medieval castle structures associated with the design of access routes would, from the point of view of contemporary bridge building, have been regarded at the very least as being audacious.

The absence of a ditch severing the access route is relatively uncommon in the period context, even though between the access ramp and the rock formation beneath the semi-circular bastion a drawbridge has been assumed that would compensate for this to a great degree. On the other hand, an explanation might once again be sought in the characteristic, steep slopes of the site.

Comparing the defensive capabilities of the first, masonry line of defence with the contemporary realisations of fortifications built for active defence with firearms

Fig. 13. Hartenštejn. *Aerial photograph by K. Kuča.*
Obr. 13. Hartenštejn. Letecký snímek hradu. *Foto K. Kuča.*



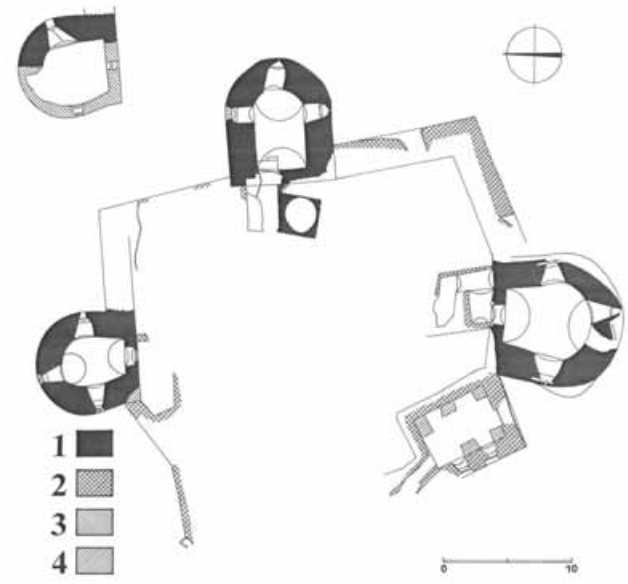


Fig. 15. Hartenštejn. Plan of the basement of the eastern part of the castle. 1 – earlier medieval masonry; 2 – later medieval masonry; 3 – Renaissance masonry; 4 – 20th century masonry. Up on the left the ground plan of the first floor of Karlovarská tower. *Drawn by J. Durdíková.*
Obr. 15. Hartenštejn. Půdorys suterénu východní části hradu. 1 – starší středověké zdivo, 2 – mladší středověké zdivo, 3 – renesanční zdivo, 4 – zdivo z 20. století. Vlevo nahoře půdorys prvého patra Karlovarské věže. *Kresba J. Durdíková.*

Fig. 14. Hartenštejn. Ground floor plan of the castle. 1 – earlier medieval masonry; 2 – later medieval masonry; 3 – Renaissance masonry; 4 – 20th century masonry. *Drawn by J. Durdíková.*
Obr. 14. Hartenštejn. Půdorys přízemí hradu. 1 – starší středověké zdivo, 2 – mladší středověké zdivo, 3 – renesanční zdivo, 4 – zdivo z 20. století. *Kresba J. Durdíková.*

(e. g. *Durdík 1996*; *1999*; *Durdík – Bolina 2001*), it must be said that this was undeniably not a leading example. It must however be understood that the actual opportunities for designing a defensive line in the narrow defile in the steep, impassable rocky slope were very limited, and were used to the maximum. The relatively weak wall, pierced by loopholes, the line of which was dictated entirely by the geomorphological situation, provided cover to fire arms users, and the small, semi-circular bastion probably originated more to attain a somewhat higher elevation than the rocky crest afforded than from a rational, defensive need for flanking fire along the walls, which were in practice not threatened by frontal assault. The northern loopholes of the bastion, however, certainly made it possible to easily control access to the first gate.

Within the framework of the design of the Late Medieval and Early Modern fortifications at Andělská Hora as a whole, and in particular of the access from the western side, the inaccessible location with its impassably steep rocky slopes was always, and given the specific situation understandably, regarded as its primary defensive quality. This limited both the opportunities and the need for the erection of artificial defences, which merely complemented and locally improved upon it. Consequently, such fortifications were not even built along its entire perimeter in masonry form, and in the less exposed areas were made only from wood (in which connection the economy of such practices should not be

forgotten). In this sense it is very instructive to compare the fortifications at Andělská Hora with the rational and well thought out designs, again predominantly for fire arms fire, at the nearby and contemporary, or slightly earlier, castle at Hartenštejn (*Durdík 2005c*; *2007*), which whilst again on a rise did not, despite its excellent location, offer such reliable natural defences (*figs. 12-14*).

The fortifications at Andělská Hora, dating to the end of the Middle Ages and the dawn of the Early Modern period, offer from the methodological point of view the interesting realisation that they are an exceptional example of the use of a unique geomorphological formation, the position of which within period castle production is for this reason peculiar to it. It is an irreplaceable, and certainly very important, monument.

Resumé:

Prvá linie opevnění s prvou branou, situovaná většinou svého průběhu v zářezu vysekaném do strmého skalního svahu, vznikla složitějším stavebním vývojem. Nejstarší součástí dnešních, několikráte v 19. a 20. století upravovaných konstrukcí, je část hradby jižně od brány s oboustranně špaletovanou střílnou s kapsou pro trámek k zaklesnutí hákovnice, stejně jako část jižní špalety otvoru brány.

Ve druhé stavební fázi vznikl zbylý průběh zalomené hradby včetně jižní polookrouhlé, dovnitř otevřené malé bašty. Tato část fortifikace je vybavena dovnitř se rozevírajícími střílnami s kapsami pro trámky na zaklesnutí hákovnice, navenek se otevírajícími širokým obdélným otvorem. Po tom, že by zde původně byly osazeny uzavírací desky např. s klíčovou střílnou, neregistrujeme za současného stavu dochování žádné stopy. Dílem druhé stavební fáze je i dnešní severní ukončení brány se žlábkem pro ukotvení navazující dřevěné fortifikace směrem ke druhé bráně. Kulisová brána s neznámým řešením vstupního portálu (či vstupních portálů) byla završena vysazeným dřevěným či hrázděným obranným patrem či polopatrem.

Obě stavební fáze jsou nejspíše dílem přestaveb pánů z Plavna koncem 15. století. Dokončení pak lze předpokládat nejpozději v rámci stavebních činností po roce 1519.

Dnešní velký polookrouhlý oblouk vstupu beze stop po uzavírání zjevně vznikl až v rámci úprav hradu po třicetileté válce, které probíhaly v dusné atmosféře nařízení císaře Ferdinada III. o boření dobře opevněných hradů, které by se mohly stát oporou eventuálního českého stavovského protihabsburského odboje. Za Humprechta Jana Černína z Chudenic dokonce muselo být v rámci vyšetřování v roce 1659 vysvětlováno, že se probíhající stavební úpravy nezabývají opevněním, ale jsou prováděny pro to, aby zámek bylo vůbec možno obývat a že v jejich rámci ve starých zdech vznikají nové otvory. Nové řešení prvé brány s velkým, špatně (pokud vůbec) uzavíratelným obloukem vstupu tak nejspíše bylo důsledkem vynucených snah o demilitarizaci hradu.

V rámci řešení pozdně středověkého a raně novověkého opevnění Andělské Hory jako celku a speciálně její vstupní západní strany byla stále a vzhledem ke konkrétní situaci nepochybně pochopitelně jako hlavní obranná kvalita ceněna nepřístupná poloha se zcela neschůdnými skalními srázy. Ta limitovala jak možnosti, tak potřebu stavby umělého opevnění, které ji vlastně pouze doplňovalo a lokálně zlepšovalo. V dobovém kontextu nepochybně nešlo o přední realizaci. Je si však nutno uvědomit, že reálné možnosti řešení obranné linie v úzkém zářezu ve strmém neschůdném skalnatém srázu nebyly velké a byly v úplnosti využity.

Opevnění Andělské Hory z přelomu středověku a novověku, nabízející z metodického hlediska zajímavá zjištění, je vynikající ukázkou využití jedinečného geomorfologického útvaru a jeho postavení v dobové hradní produkci je díky tomu zvláštní. Jde tak bezesporu o nezastupitelnou, velmi významnou památku.

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Late Medieval fortifications of the town of Hradec Králové

Pozdně středověké opevnění města Hradce Králové

Die spätmittelalterliche Befestigung der Stadt Hradec Králové

Radek Bláha

Die Befestigung der ostböhmischen Stadt Hradec Králové wurde in der zweiten Hälfte des 15. Jahrhunderts um zwei Mauerlinien ergänzt. Es handelte sich dabei um eine Zwingermauer mit halbkreisförmigen Bastionen. Im oberen Teil des Südhangs der Anhöhe, auf der sich die Stadt befand. Die untere Stadtmauer hatte die Gestalt einer einfachen Ziegelmauer, die meist in der Nähe der Stadttore oder Pforten mit halbkreisförmigen bzw. viereckigen Bastionen verstärkt war. Beim Studium der Entstehung und Entwicklung dieser Befestigungsanlagen können ikonographische Quellen genutzt werden (Stadtansichten aus dem 17.-18. Jahrhundert), Karten und Stadtpläne vor allem aus dem 18. Jahrhundert), Schriftquellen und nicht zuletzt auch archäologische Quellen. Eine wichtige Informationsquelle bilden die Funde von sekundär genutzten architektonischen Bauteilen aus der Früh- und Hochgotik, die in diesem Fall in der unteren Stadtmauer wiederverwertet wurden.

1. Introduction

In the Middle Ages, Hradec Králové was a prominent royal dowry town and the most important urban centre in the northern part of Eastern Bohemia. It is favourably situated on an elevated plateau roughly 13 hectares in area and 10-15 metres above the confluence of the Elbe and Orlice Rivers. The people of the prehistoric Funnel Beaker culture were the first to notice this advantageous position, and in the early Bronze Age a fortress settlement (Gord) and a wood-and-clay wall were built. No later than the 10th century, Slavs used the remains of these structures as a base for a rampart. After the town was chartered at the start of the 13th century (first written mention of this status dates from 1225), a modified version of the mediaeval wood-and-clay rampart structure, with a stone front wall, evidently served for some time as the town fortifications. According mainly to written sources, the construction of brick walls did not take place until sometime in the first half of the 14th century. The upper town wall, with square towers and bastions, stood on the upper edge of the plateau, and its foundations were built into the ruins of the prehistoric and early mediaeval rampart structure. The upper town wall was not, however, the only part of the town's defence. By the end of the mediaeval period, two more circuits of town fortifications had been added, one a kind of outer ward wall, built on the upper part of the hillside descending from the plateau, and the other a lower town wall at the foot of the hillside. Early modern ground fortifications of the town (and its environs) dating from the Thirty Years War and from the 18th century, including the late Baroque bastion fort dating from the last third of the 18th century, warrant separate attention and are outside the scope of this paper.[1)]

Note 1:
I would like to thank Ing. Jiří Slavík from the National Heritage Institute's regional office in Pardubice for reading the first version of this article and for consultation and for his many valuable comments.

2. An overview of research to date

The town's earliest historians, K. J. Biener of Bienenberg and F. Švenda, believed that the reconstruction of the town fortifications and their expansion, with the addition of the new systems of walls, occurred during the reign of Jiří of Poděbrady and/or the subsequent period of Jagiellonian rule. They based this opinion on the discovery of the initials G and W[2)] preserved in the southern tower of the upper Mýtská Gate (built into the upper town wall) and on the stone plaque on the outer (lower) Mýtská Gate, in which the year 1520 is inscribed, and they may also have based their view on other sources no longer accessible today (*Bienenberg 1780*, 378-379, 412, 442-443; *Švenda 1800*, 176-178; for a description of epigraphic sources see *Cechner 1904*, 32). W. W. Tomek believed that the main town wall in the high Middle Ages lay at the foot of the plateau, and in his opinion the plateau itself was rimmed only with towers or bastions (*Tomek 1997*, 32; however, in his earlier work from 1837 he writes of "double walls"! – *Tomek 1997*, 20). B. Spiess dated the construction of the mediaeval town walls to the period between the first and second quarters of the 14th century; he does not however rule out the possibility that the lower wall already existed at that time (*Spiess 1895*, 9). A. Kubiček and Z. Wirth argued that the outer ward wall already existed in the pre-Hussite period and concluded that both it and the upper town wall had been built around the year 1320 (*Kubiček – Wirth 1939*, 23). In the late Gothic period the entire fortification (including the upper town wall) underwent reconstruction and a third, lower wall was added (*Kubiček – Wirth 1939*, 30). D. Líbal reached similar conclusions (*Líbal – Líbalová – Vilímková 1956*, 7).

Note 2:
The information from *A. Cechner* (*1904*, 32) that the letters G and W were inscribed in the mortar cannot be verified today.

New stimuli and information have been provided by the outcome of archaeological excavations and field surveying. L. Domečka observed the groundwork connected with the construction of a brewery malt house in 1897 at the foot of the plateau, at the original mediaeval core of the town, in the area of the lower town wall. During this groundwork, the existence of a ditch was recorded, the content of which yielded archaeological finds that date widely from between the high Middle Ages and the early modern age. A cemetery was discovered immediately to the southwest of the ditch, and this was probably attached to the Church of St. Lawrence (kostel sv. Vavřince), but a stratigraphic relationship between the ditch and the cemetery cannot be determined on the basis of the contemporary description of the context (*Domečka 1898*, 72). There is also no mention of the existence of the remains of the lower town wall in this area, though this can be explained by the fact that this section had by that time already been demolished down to and including its foundations.

Other findings were made later when parts of the walls were renovated or, more precisely, reconstructed and used as terrace walls during garden landscaping work. For example, in 1929 three embrasures were discovered in the masonry during construction to lower the apex of the lower town wall, at the point just below buildings 50 and 51 (*Anonym 1929*, 4).

All the information gathered to date on the lower wall was last collated in a monograph by M. Richter and V. Vokolek. Based on a meticulous analysis of Willenberg's townscapes, surviving plans from the 18th century and earlier, and the authors' own archaeological excavations and field surveying, they dated the construction of the outer ward wall to the pre-Hussite period, with the bastions being added later on. The two authors dated the origin of the lower town wall to the late Gothic and early Renaissance period, that is, the 15th and early 16th centuries (*Richter – Vokolek 1995*, 97-98).

3. An overview of sources

In addition to archaeological excavations and field surveying, the fortifications of the town of Hradec Králové can also be studied using iconographic, cartographic, and written sources.

The oldest iconographic source is a pair of townscapes by Willenberg from the late 16th and early 17th centuries. One is a woodcut from Bartoloměj Paprocký's "Diadoch" of 1602, depicting the heart of the town of Hradec Králové viewed from the southwest (*fig. 1*; *Doubrava 1971*). The other is a pen-and-ink drawing by Jan Willenberg created around 1600, which depicts in considerable detail the district of Pražské Předměstí (Prague Suburbs) and part of the town centre viewed from the southwest. These two images show us the entire western and southern strip of the wall (*Doubrava 1971*).[3)] Unfortunately, there is no similar source for the eastern and northern parts of the town. Werner's townscape of the town, dating from 1740, provide a view from the northwest, but the walls in particular are depicted with some inaccuracy and simplification (*fig. 2*; for an analysis see *Richter – Vokolek 1995*, 108).

Fig. 1. The view of Hradec Králové from the southwest. Woodcut by J. Willenberg, 1602. From *Doubrava 1971*.
Obr. 1. Hradec Králové od jihozápadu. Dřevoryt J. Willenberga, 1602. Podle *Doubrava 1971*.

Maps and town plans can also be used to study the origin and evolution of the town fortifications in Hradec. These sources only provide information on the appearance of the Hradec walls in the early modern age, but that can be used to successfully reconstruct its appearance in the earlier – mediaeval – period.

Fig. 2. The view of Hradec Králové from the northwest (detail). Pen-and-ink drawing by B. B. Werner, circa 1740. From *Richter – Semotanová 1998*, fig. 5.
Obr. 2. Hradec Králové od severozápadu (výřez). Perokresba B. B. Wernera, kolem 1740. Podle *Richter – Semotanová 1998*, obr. 5.

The oldest surviving plan, Cappi's from 1650 of the siege of Hradec Králové, showing what it looked like in 1640 (*Doubrava 1971*; *Richter – Semotanová 1998*, map sheet no. 2, map no. 4), is too schematic (the layout configurations for Velké náměstí (Great Square) and Malé náměstí (Small Square) and the surrounding streets contain major errors, for example, Malé náměstí is portrayed as larger in area than Velké náměstí, which in reality it is not), but the layout of the town fortifications and the ground artillery bastions below the town, which originated during the Thirty Years War, are depicted more accurately. The upper town wall is punctuated with square bastions. The outer ward wall in this plan surrounds the town from the northern, eastern, and southern sides, but it is absent on the western side. The author depicts it as a wall with numerous semi-circular bastions. In Cappi's plan the lower town wall runs around the entire town, and with the exception of the gates there are no towers or bastions built into it along the way.

The map also contains later views of Pražská and Mýtská Gates (including the then newly built ground bastions in front of each of them). Slightly modified versions of these drawings of the gates were used as the inserts in the study by F. Švenda (for the modern edition, see *Doubrava 1971*).

A much more accurate source is the set of plans that date from about a century later, which were created in connection with the preparation and execution of the reconstruction of Hradec Králové into a late Baroque bastion fort. A major portion of these documents pertaining to the structure

Note 3:
An as yet undervalued and unused iconographic source is the oil painting on wood of the organ in the Temple of the Holy Spirit (chrám sv. Ducha) in Hradec Králové, dating from 1638 (*Doubrava 1971*, unpaged). It depicts the town core from the south, including the upper town wall and part of the outer ward wall. The lower town wall does not appear in the painting.

Fig. 3. Pavlovský's plan of Hradec Králové, 1767-68 (detail). From *Richter – Semotanová 1998*, map sheet no. 5, map 9.
Obr. 3. Pavlovského plán Hradce Králové, 1767-68 (výřez). Podle *Richter – Semotanová 1998*, mapový list č. 5, mapa 9.

of the Hradec Králové fort are located in the Vienna War Archives, and in the Czech Republic only copies of some of the plans are available[4)]. Klier's plan from 1745 and Pierker's plan from 1756 (*Richter – Semotanová 1998*, map sheet no. 3, map nos. 5 and 6) contain a very precisely drawn layout of the town and the course of development and the appearance of the fortifications. Similar information is provided in Pavlovský's plan of Hradec Králové and its environs, dating from 1766/7 (*fig. 3*; *Richter – Semotanová 1998*, map sheet no. 5, map 9).

Some of the fortification plans dating from the second half of the 1760s to the first half of the 1770s are currently lodged in the Státní okresní archiv (State District Archive) of Hradec Králové. These include plan no. 5037 from 1766/7, and also, for example, no. 5041 from 1771, no. 5038 from 1773, and no. 5039 from 1774 and others. Among other things, the plans very accurately depict the circuit of the mediaeval and early modern fortifications and the ground plans of the towers and the bastions. It is also possible to trace in them, for example, the alterations and reconstruction to the mediaeval Hradec fortifications and how they were used militarily as part of the defence of the later fort (e. g. reconstruction work on the sections in the upper town wall and the outer ward wall for the addition of an artillery battery). The plan from the permanent land register in 1840 (*Richter – Semotanová 1998*, map sheet no. 7, map no. 11) no longer directly depicts the mediaeval fortifications, but the circuit of the upper and lower town walls can be reconstructed on the basis of the lot perimeters. These cartographic sources are on the whole very important for the study of the Hradec fortifications, and their value is heightened when used in combination with other sources of information.

Written sources consist first of all of the relatively numerous royal documents and privileges that contain references to the walls and fortifications of the town (in the pre-Hussite period, for example, in the years 1321, 1364, 1378; *Mikulka 1996*, 32, 35, 37). These documents deal with tax relief, the possibility of obtaining construction materials, and revenue, for example, from tolls for making repairs and improvements to the fortifications. But it is not clear what parts of the fortification are referred to. Little, and moreover somewhat ambiguous, information is provided by the written records from the late mediaeval and early modern period. A fragment of the inventory of the burgrave's expenses from 1504 mentions repairs to Soukenická Gate (otherwise known as Kozí Gate in the southwest part of the town by Soukenická Street, between what is today the dean's office and the former brewery, which is

Note 4:
In addition to the plans cited in the text, there is also, for example, a copy of the Plan der Festung Königgrätz, dated (incorrectly?) from 1763, in the archive of plans in the National Heritage Institute's central office in Prague, no. PPOP-996-5-244; printed in *Richter – Vokolek 1995*, 93.

now an administrative centre) and also mentions the construction of bastions somewhere in the area below the castle (*Mikulka 1996*, 167). This information corresponds to a report by K. J. Biener of Bienenberg about repairs to the walls and the ditch (unfortunately without any greater detail), with a reference to the year 1502 (*Bienenberg 1780*, 413).[5)] The National Revival-era historian of Hradec Králové, F. Švenda, cites (from sources no longer in existence today) two important pieces of information referring to the town fortifications: in 1543 the construction of the second bastion at Mýtská Gate (*Švenda 1802*, 32), and in 1544 the construction of the bastion at Kavčí Square (*Švenda 1802*, 38). Further mention of the walls date only from the 17th and 18th centuries (repairs to the walls – all three? – in 1674, leasing the outer ward to the burghers in 1718, etc. – see *Mikulka 1994*, 124).

Note 5:
In this context there is considerable information worth noting about the increase in the production of firearms, gunpowder, and ammunition in Hradec Králové that occurred in the early 16th century (for a summary see *Mikulka 1996*, 174).

The ruins of the mediaeval fortifications of Hradec Králové have unfortunately not yet been the target of any comprehensive modern historical-structural investigation, with the exception of a (very) general historical-structural investigation of the town centre in the mid-1950s (*Líbal – Líbalová – Vilímková 1956*, 11-12).

4. The outer ward wall

We will now turn our attention to describing and evaluating the current state of conservation of the late mediaeval parts of the Hradec town fortifications, and to the information in preserved sources.

The outer ward wall (*fig. 4*) ran around the southern side of the Hradec plateau, about 6-10 metres in front of the upper town wall. Willenberg's townscape and map sheets from the 18th century on the whole similarly depict the wall as beginning on the southwest side of the town in the area of Kozí Gate

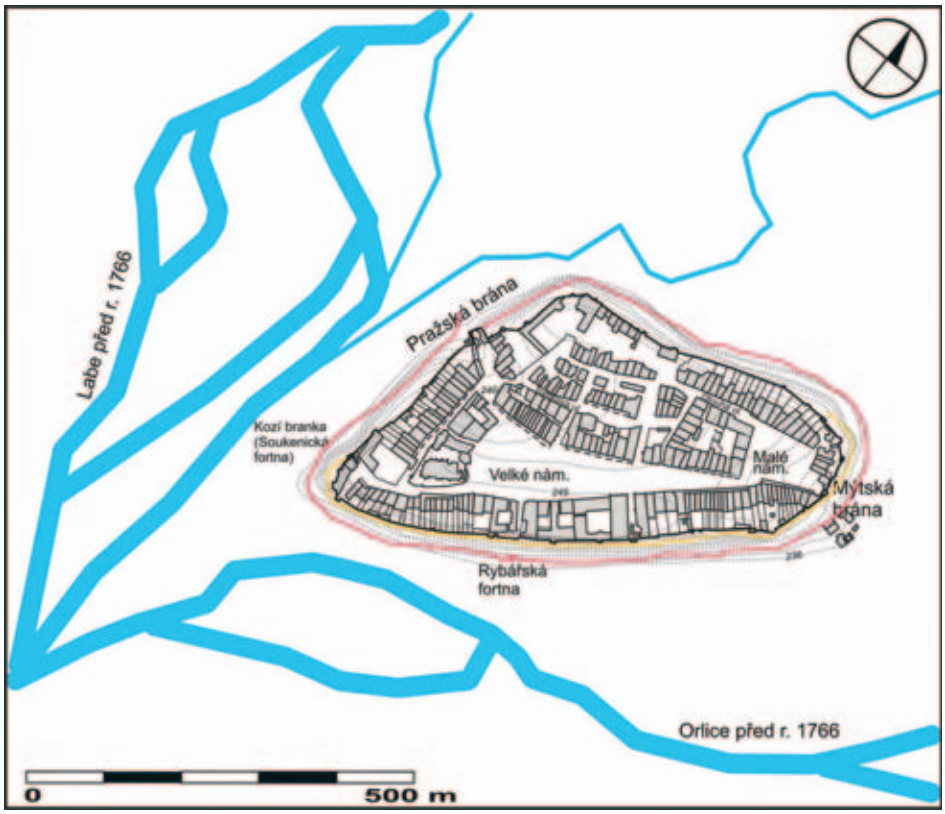

Fig. 4. A reconstruction map of the town from 1766, on which the individual parts of the town's fortifications are marked out. The circuit of the upper town wall is marked in black, the outer ward wall in yellow, and the lower town wall in red.
Obr. 4. Rekonstrukční mapa města dle stavu k roku 1766 s vyznačením jednotlivých částí městského opevnění. Černě zobrazen průběh horní městské hradby, žlutě hradba parkánová, červeně dolní městská hradba.

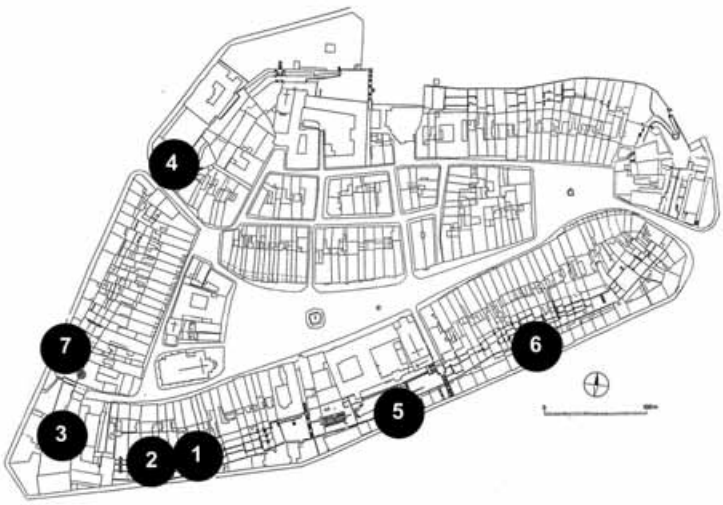

Fig. 5. The historical core of Hradec Králové, showing the sections where archaeological excavations and documentation were carried out.
1 – a bastion on the outer ward wall behind building 46;
2 – a bastion on the outer ward wall behind building 50;
3 – a bastion on the outer ward wall and a section of the wall in the grounds of the former brewery;
4 – building 81 on V Kopečku Street;
5 – the section of the lower town wall between the Bono Publico Steps and the Gočár Steps;
6 – the section of the lower town wall opposite the Secondary School of Health Studies;
7 – a section of the lower town wall on ČSA Avenue, lot no. 302/1.
Obr. 5. Historické jádro Hradce Králové s vyznačením částí archeologicky odkrytých a dokumentovaných úseků.
1 – bašta parkánové hradby za čp. 46;
2 – bašta parkánové hradby za čp. 50;
3 – bašta parkánové hradby a úsek zdi v areálu bývalého pivovaru;
4 – čp. 81 v ulici V Kopečku;
5 – úsek dolní městské hradby mezi schodištěm Bono Publico a Gočárovým schodištěm;
6 – úsek dolní městské hradby proti Střední zdravotnické škole;
7 – úsek dolní městské hradby na třídě ČSA, parc. 302/1.

(Soukenická Gate), which is part of the upper town wall. Only Willenberg's townscape indicates that at that point, as part of the defence of this entrance to the town, there also stood a low square tower with a passage. From there, the wall continued further to the south and eventually the southwest, and from there it turned sharply to the east. At that bend the wall was reinforced with two semi-circular bastions facing onto the town. The wall continued further along the southern edge of the plateau, where it contained two (still preserved) semi-circular bastions, located below the chapter houses 50 and 46 (*fig. 5*), and approximately 45 metres apart from each other. A U-shaped bastion stood behind buildings 37 and 38. In the area of the bishop's residence (no. 34) and the neighbouring Jesuit college and the Church of the Assumption of Virgin Mary (kostel Nanebevzetí P. Marie), the entire strip of wall was reconstructed during the 17th and 18th centuries to make gardens. The earlier appearance is shown only in Willenberg's townscape, in which we can see two bastions or small towers south of the Jesuit college, at least one of which is round. Between the bishop's residence and the Jesuit college there was, already in the mediaeval period, a passageway leading out of the town, called Biřická or Rybářská Gate, and at the start of the 19th century the Bono Publico Steps were built here. A square tower or bastion offered a passage through the outer ward wall (according to Willenberg's depiction). Another bastion lay just to the east, behind building 29, in close vicinity to the Kropáčka water tower. The scene Willenberg captured at these points is not too clear; the outer ward wall in front of the tower forms a relatively large, "bastion-like", and clearly right-angled ledge, as though the wall went around the tower. The course of the wall in the direction of Mýtská Gate is also not entirely clear from sources: most plans from the 18th century show that by that time this section of the wall had already been taken down, and its course can only be inferred by the shape of the land; the edge of the plateau, and with it the wall, turn here in a northeast direction. Willenberg's townscapes indicate that the outer ward wall was reinforced from this point up to Mýtská Gate with at least three bastions. The appearance of the wall at Mýtská Gate is also unclear. According to historical plans, the central tower gate was evidently part of the lower town wall (*Slavík 2004*, 267, indicates that it stood near the outer ward wall). Beyond Mýtská Gate the outer ward wall ran along the edge of the plateau in a north and northwest direction and terminated in a bastion located just beyond Kavčí Square, northeast of Malé náměstí. In addition to that bastion, Pierker's map from 1756 shows only one other bastion, behind building 126. It is not certain whether these are the bastions built in 1543 to 1544 (according to the above-cited refernces in written sources), but it is likely.

Neither the surviving townscapes (Werner's from 1740) nor the historical map sheet give an indication of what the course of the outer ward wall may have been on the northern side of the town. Moreover, relatively substantial terracing work was done here during the early modern period. As for the appearance of the outer ward wall and bastions, Willenberg's townscape depicts the wall as low-lying (unlike the upper wall), with a series of apertures in its upper part (these may be embrasures), and without battlements. The bastions are portrayed

as semi-cylindrical, two-storey structures, with little windows or embrasures on top of each other and with conical roofs. The drawings of both town gates in Cappi's copperplate engraving and in the work by F. Švenda portray the outer ward wall as just a palisade, which is inconsistent with the evidence provided in other sources (see also the description in *Richter – Vokolek 1995*, 94-95).

Fig. 6. A preserved bastion on the outer ward wall south of house no. 46.
This and the other photographs by the author.
Obr. 6. Dochovaná bašta parkánové hradby jižně od čp. 46.
Foto tohoto a dalších snímků autor.

The ruins of this wall, which are visible to this day, survived on the southern side of the town, behind the rear sections of the chapter houses, including both bastions behind numbers 50 and 46 (*fig. 6*). The outer ward wall, which in this section visibly reached a height of 2 metres, was substantially reconstructed, and in the early modern and more recent periods the masonry was redone. Nonetheless, evidence of the construction of the lower part of the wall and the bastions using mortared hewn slate can still be seen. Until recently the outer ward wall had not been the target of any detailed archaeological excavation, with the exception of the trenches dug behind building 45 and 2 in the late 1960s and early 1970s. Much more recently an approximately 50-metre section was studied as part of an advance archaeological rescue excavation before the reconstruction of the former brewery in 2004 to 2006. The results of this excavation have not yet been fully processed, but it is possible to present the preliminary findings.

As mentioned above, iconographic and cartographic sources point to the existence of one cylindrical bastion in the area of the brewery just slightly east of the new malt-house building. From this the outer ward wall evidently turned sharply to the east along the edge of the plateau. Only Willenberg's townscape depicts the course of the wall in the direction northwest from the bastion, while, conversely, surviving plans from the 18th century unanimously indicate that the wall did not continue northeast beyond this bastion. The archaeological excavation helped clarify these inconsistencies. Although the original terrain of the courtyard in the area where the bastion was to have stood was damaged by the construction of a weighing machine, one of the trenches dug in the autumn of 2004 uncovered slate masonry laid out in an arch shape. It was soon determined that this was really the above-mentioned U-shaped bastion (*fig. 5, 7*). The masonry was approximately 80-100 centimetres thick, the bastion's preserved height was approximately 2 metres, and the radius of its arch was approximately 2.5 metres. The cracked, flat, slate stones were bonded with a relatively good-quality lime mortar. The outer face of the bastion was smoothly covered with a layer of plaster. In a few places fragments of Gothic-size bricks ("cakes") with grooved faces (the maximum preserved dimensions of the sides of the bricks was 10 centimetres) were found between the slate pieces. In the next dig, as part of the second stage of excavation in 2005, the continuation of the wall itself was discovered, in both the southeast

Fig. 7. Archaeological excavation in the former brewery, 2005. Groundplan of the unearthed U-shaped bastion on the outer ward wall.
Obr. 7. Archeologický výzkum v bývalém pivovaru, 2005. Půdorys odkryté podkovovité bašty parkánové hradby.

Fig. 8. Archaeological excavation in the former brewery. Part of the unearthed wall of the outer ward wall, with the remains of the passage through Soukenická Gate.
Obr. 8. Archeologický výzkum v bývalém pivovaru. Část odhalené zdi parkánové hradby s reliktem průchodu Soukenickou brankou.

and northeast directions. Thus it was not possible to confirm the information from the plans from the 18th century that in this section the outer ward wall terminated in a semi-cylindrical bastion. The masonry on the wall itself was done using the same method as the bastion; between the bastion and the wall the excavation did not uncover any break in the masonry that would suggest that the bastion had been added to the wall subsequently (contrary to previous assumptions, for example, by D. Líbal, M. Richter and V. Vokolek). The surviving height of the wall was approx. 20-120 centimetres, depending on the lay of the land and the degree of recent damage. It can be confirmed with certainty that the wall continued in the northeast direction to the tower of Kozí Gate, where an entrance was cut into the wall (probably in the form of a tower-like gate). This is evident from the blunt angle of the break in part of the masonry uncovered here, and Willenberg's townscape also indicates this (*fig. 8*). Unfortunately the continuation of the wall was destroyed in the modern period. It is interesting that in the masonry of this presumed tower gate a greater number of Gothic-size bricks were used, though the way in which they are worked into the masonry of the wall indicates that they clearly originated with it. Based on the fragments of ceramics and several small coins found in the wall's foundation ditch, and based even on the appearance and character of the masonry, it is possible to date the construction of this part of the Hradec town fortification system to the second half of the 15th or the start of the 16th century. The outer ward wall's possible predecessor was also detected: its foundations rested in the fill of the ditch, which follows the wall's course (with the exception of the bastion) almost exactly and practically throughout its full length. This ditch was on average 50 centimetres wide and approximately 100 centimetres deep (*fig. 9*). Also found in its fill were numerous fragments of slate and prehistoric ceramics, including several atypical fragments, probably dating from the high Middle Ages. The ditch may have served as the foundation for a wooden palisade.

Fig. 9. Archaeological excavation in the former brewery. The older palisade ditch beneath the foundations of the outer ward wall.
Obr. 9. Archeologický výzkum v bývalém pivovaru. Starší palisádový žlab pod základy parkánové hradby.

5. The lower town wall

The lower town wall (*fig*. 4) runs around the full circumference of the foot of the plateau. Willenberg depicts it as a simple wall with battlements and embrasures, reinforced with towers and bastions only at several points along its course. At the westernmost side of the plateau, below the site of the dean's office today (house no. 58), only a plain, square, bastion-like projection extended from its face. At the point of the bend in the wall as it turns south and eventually southeast, near the former brewery, there was a gate in the wall through which a path ran at an angle into the incline in the direction of Soukenická (Kozí) Gate. Beyond it, the wall was reinforced with three semi-cylindrical bastions, set a small distance of approximately 25 to 40 metres apart from each other (the last of them below buildings 50-51). One of these bastions (the westernmost one) was reconstructed into a limekiln. Further to the east the wall was reinforced with a square bastion, roughly below where building 45 stands today. Another one stood immediately adjacent to the entrance gate where the Bono Publico Steps are located; the bastion, though reconstructed, can be seen there to this day. Between Rybářská Gate and Mýtská Gate the only square bastion was located south of building 6. The central tower-like structure at Mýtská Gate, destroyed during the Thirty Years War, connected with the lower town wall[6)] (for more on the gate see *Slavík 2004*, 267; according to the author the gate may date from the Jagiellonian period). From there, the wall continued along the foot of the incline, first northeast and then turning sharply northwest. Historical plans do not depict any tower or bastion here, and just show a series of buttresses reinforcing the wall. By the middle of the 18th century the section of the wall between buildings 111 and 101 is missing; north of Klicpera Theatre today (house no. 98) and the former military hospital (house nos. 92-95) it was again without any additional defensive features (only a series of ledges – buttresses). Beneath the former burgrave's house and the adjacent Church of St. John Nepomuk (kostel sv. Jana Nepomuckého), today Městská hudební síň (Town Music Hall)), the wall circuit was already interrupted in the 18th century (although originally the wall certainly continued through this area). Werner's townscape from 1740 also shows the wall continuing from the church. Below the former castle the wall turned southwest toward Pražská Gate. In this section it was reinforced with a massive, square tower (some plans from the 18th century depict it as just a square ledge). Even Willenberger depicts it as a square two-storey tower without a roof, though it is depicted on the edge of both townscapes of Hradec, and therefore it is not entirely clear whether it really is the same tower. Werner, however, portrays it as a cylindrical tower with a conical roof (this discrepancy was noted in *Richter – Vokolek 1995*, 108; for a description of the entire lower wall, see p. 96 and p. 98). In the area of Pražská Gate a decorative Renaissance foregate[7)] was built on the level of the lower town wall (on the gate and the foregate, see, most recently, *Slavík 1998*, 184-191). Some plans from the 18th century show the southern wing of the lower town wall inclining slightly to the west before it reaches the Pražská Gate and thus covering the approach route from the Pražské předměstí (Prague Suburb). Even Willenberger depicts a kind of bastion-like ledge or a bastion at this spot in his townscape, and so it may have originated at the time of the construction of the Renaissance foregate.

Historical plans of the town indicate the existence of a ditch below the lower town wall. Reliable archaeological evidence of its existence has only been found on the southern side of the town (see below).

Note 6:
The upper, two-towered Gothic Mýtská Gate in the upper town wall was demolished in 1873 and other parts in 1898; the remains can still be seen in houses 2 and 126. The central gate was connected to the lower wall and was destroyed during the Thirty Years War. The outer gate, protruding into the area of what is now Komenský Street, was from 1520 (according to a preserved plaque) and was destroyed in 1786 (for details see the study by *Slavík 2004*).

Note 7:
Demolished in 1873 and its remains in 1884 (*Slavík 1998*, 186).

One piece of information that appears in the literature is that in 1775 the lower wall was demolished in full (*Kořán 1977*, 501); however, contemporary sources and the remains of this wall indicate that this information primarily applies to the southwest point of the plateau, below the dean's office and the grounds of the former brewery, where the wall and its foundations were removed during the construction of the fort (for information on the year 1779, see *Švenda 1814*, 205), and it also applies to the northern side of the town. The still visible remains of the wall, at a height of 4-6 metres (used as a support wall), mainly survived on the southern side of the town (e. g. opposite the Střední zdravotní škola (Secondary School of Health Studies), but an almost 20-metre section was only re-walled in 2003 and 2006). Buildings and their courtyards have been built on parts of the wall's foundations since the end of the 19th century (in the southern part of what is today ČSA Avenue).

Fig. 10. House no. 81, archaeological excavation in 2000–2001. Re-used architectural stone mouldings in the foundations of the lower town wall.
Obr. 10. Čp. 81, archeologický výzkum v letech 2000-2001. Druhotně použité architektonické kamenné články v základech dolní městské hradby.

The lower town wall was archaeologically investigated and documented at several locations (*fig*. 5). An archaeological excavation was carried out at the start of 2001 at building 81 on the lower part of V kopečku Street. The former fortification building used the lower town wall as its eastern ground wall. It was found that here the wall was partly grounded in the building's filler, interpreted to be a ditch. Ceramic finds made it possible to date its fill to the period of the 14th century. The face of the lower wall survived right through to the ground-level floor; in the foundation sections of the wall (built from Gothic-size bricks, 26-27 x 13 x 8-9 centimetres), along a length of approx. 10.5 metres, three to five rows of re-used architectural stone mouldings from the 13th-14th century were uncovered (*fig. 10*). Both the fill of the ditch (from the 14th century), and especially the re-used construction material in the foundations of the wall, date from the time of the construction of the lower town wall: the sandstone architectural mouldings most likely came from several ruined, evidently church structures. In the history of Hradec Králové there are two periods during which church architecture experienced large-scale destruction: one was the Hussite revolution, the second was the construction of the bastion fort in the third-quarter of the 18th century. Given that the building materials used consist exclusively of elements that can be dated from the early and high Gothic periods, the first occasion is more likely. This means that the construction of this section of the lower wall can be dated at the earliest to the second quarter of the 15th century (*Bláha – Slavík 2002*; *Slavík – Sommer 2001*).

Fig. 11. Archaeological excavation of the lower town wall below Nový Adalbertin (New Adalbertin), 2002. Foundations of the lower town wall.
Obr. 11. Archeologický výzkum dolní městské hradby pod Novým Adalbertinem, 2002. Základy dolní městské hradby.

In 2002 an archaeological rescue excavation was carried out in the southern part of the strip of wall above Komenského Avenue. In the section between the Gočár Steps and the Bono Publico Steps, structural safety work was carried out at one spot on the lower bearing wall, using the lower town wall as its foundation (*fig. 5*).

Fig. 12. Archaeological excavation of the lower town wall below Nový Adalbertin. Re-used sandstone architectural mouldings.
Obr. 12. Archeologický výzkum dolní městské hradby pod Novým Adalbertinem. Druhotně použité pískovcové architektonické články.

Fig. 13. Archaeological excavation of the lower town wall below Nový Adalbertin, embrasures.
Obr. 13. Archeologický výzkum dolní městské hradby pod Novým Adalbertinem, střílna.

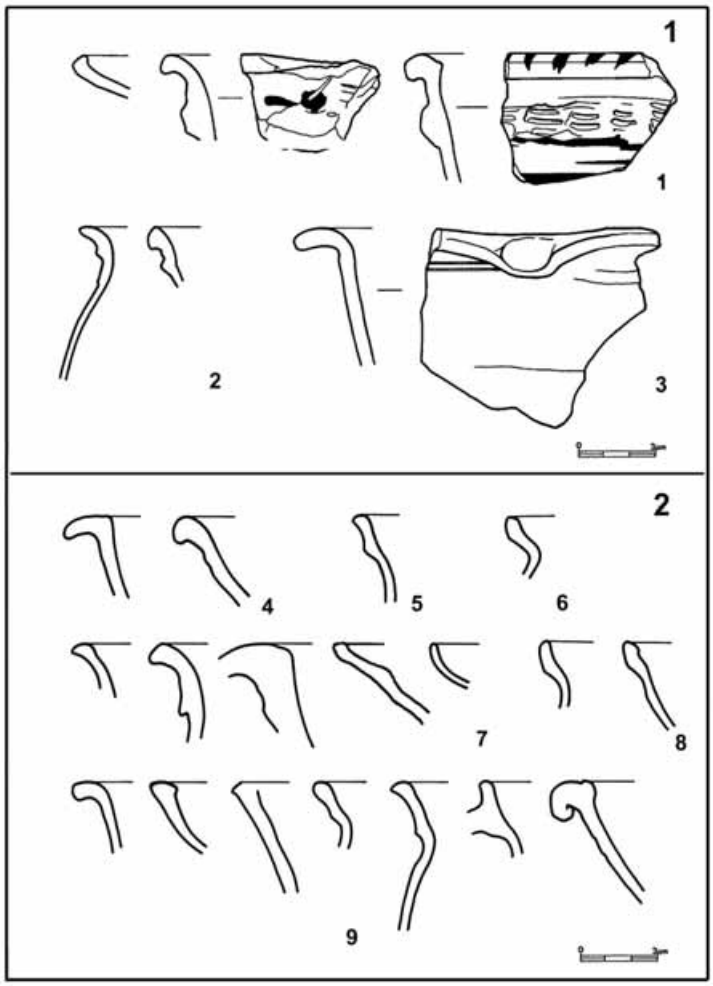

Fig. 14. Archaeological excavation of the lower town wall below Nový Adalbertin. A sample f the ceramics obtained from the oldest fill layers in the wall foundations.
Obr. 14. Archeologický výzkum dolní městské hradby pod Novým Adalbertinem. Výběr keramického materiálu získaného z nejstarších zásypových vrstev základu hradby.

The construction digs and archaeological trenches revealed the wall in its full height and it was possible to at least roughly determine the main stage of construction. In the first stage, the foundation was built, at a height of at least 120 centimetres, walled with irregularly hewn fragments of shale and bricks and thickly grouted (*fig. 11*). Attached to this foundation, with just a slight offset (approx. 5 centimetres) was a wall with a preserved height of approx. 95 centimetres, built with regular rows of bricks bonded with a good-quality, fine-grained mortar, worked well into the joints. In some places instead of bricks, sandstone blocks and sandstone architectural mouldings were used (e. g. part of the Gothic shafts, etc. – see *fig. 12*). Parts of two funnel-shaped embrasures were uncovered in the masonry (*fig. 13*), similar to the ones discovered during repairs to the wall in 1929. The entire wall, including its foundation, leans at an angle of approximately 10-15 degrees, owing to the effect of earth piled later on the opposite side of the wall.

Ceramics were obtained from the lowest layers along the inner face of the wall, dating from the 15th to the 16th century (*fig. 14*; *Bláha 2003*).

The lower town wall was excavated again in 2003 in connection with the re-walling of a roughly 8-metre section on Komenského Street opposite the Střední zdravotní škola (Secondary School of Health Studies – *fig. 5*). At that time thirty re-used Gothic sandstone mouldings were discovered in its foundations (ribs, jambs, tracery, etc.; these can be dated similarly to the architectural mouldings from house no. 81), and subsequently it was possible to document the lengthwise section and the cross-section of the context 12 metres in length and 6 metres high.

The foundations of the lower part of the wall, made out of hewn slate and the above-mentioned re-used architectural mouldings, were set in a marly subsoil, followed by a sequence of relatively level deposits alongside the wall's foundations. The upper parts of the wall were built of Gothic-size bricks (approx. 25-27 x 12 x 9 centimetres) with lengthwise grooves carved into their upper face. Pieces of sandstone formed the outer face of the upper parts of the wall. A coarse-grained lime mortar and in a few places a sharp-edged aggregate were used as the bonding agent. Evidence was found in the upper parts of the over four-metre wall of early modern re-walling, using a noticeably different size of bricks (27.5 x 13 x 6.5 centimetres) and gauged mortar. The wall's most striking feature was its tilt in the southern direction towards Komenský Avenue (*fig. 15*). Buttresses made of the same material as the above-described re-walling were therefore put in place along the front of the wall's face. These buttresses partly damaged the northern edge of the filled ditch,

Fig. 15. Komenského Avenue north of the Secondary School of Health Studies, 2003. Profile of the lower town wall.
Obr. 15. Komenského třída severně od Střední zdravotnické školy, 2003. Profil zdi dolní městské hradby.

Fig. 16. ČSA Avenue, lot no. 302/1, 2004. Profile of the lower town wall with the remains of a gallery (?).
Obr. 16. Třída Československé armády, parc. č. 302/1, 2004. Profil zdi dolní městské hradby s pozůstatky ochozu (?).

the depressions in the ground, running along the front of the wall. Ceramic fragments, mainly from the 16th-17th centuries, were found in the deposits contiguous to the wall (the pressure of which caused it to lean) (*Bláha 2004*, 185-187, 211).

Another section of the lower town wall was – unfortunately just perfunctorily (owing to the late notification of construction work) – documented during the construction of a new building on lot no. 302/1 on ČSA Avenue, northeast of the Kozinka Steps (*fig. 5*). The ruins of the masonry of the lower town wall in the southwest-northeast direction cut across the construction site of the future building. The maximum surviving height of the wall was approximately 3.5-4 metres above the level of the surrounding terrain, the width of the wall at ground level was around 1 metre, and at the height of 3 metres it was 70 centimetres. At this level the inner side of the wall revealed a rectangular recess about 40 centimetres deep, which may be the remains of a gallery (*fig. 16*). The width of the surviving crown of the masonry was just 30 centimetres. Gothic-size bricks were used as construction material (approx. 26 x 12 x 9-10 centimetres), and in places slate blocks or plates were found alongside the bricks. The building materials were bonded with a good-quality lime mortar. Unlike the other sections of this fortification, no re-used Gothic sandstone architectural mouldings were uncovered. Archaeological material (ceramic fragments) dating from between the 16th and the 18th centuries was found in the layers of earth piled up against the wall on the side of the incline.

6. Dating

As mentioned above, there is no direct information in written sources that makes it possible to date the construction of the outer ward wall and the lower wall, but using iconographic sources (Willenberger's townscapes) their construction can be reliably dated back to before 1600. It has already been noted that the youngest ceramic finds unearthed in the fill of the foundations of both walls date from a wider time frame, between the late 15th and first half of the 16th centuries, that is, between the end of the Hussite period on the one hand, and the waning period of Jagiellonian rule and the start of the Habsburg era on the other. It is worth noting that it was during this period that there was a considerable increase in construction activity in Hradec Králové[8]. Contemporary written sources refer to repair and construction work in connection with the town fortifications (*Mikulka 1996*, 167). Another reason for construction work was the frequent fires in the town, especially between the 15th and first half of the 16th centuries (fires broke out in the years 1407, 1416, 1484, 1509, 1512, 1517, 1536 – *Mikulka 1996*, 39, 175; *1997*, 355). The start of the 16th century saw the political conflict between the royal towns and the nobility gradually come to a head, and although written sources provide no information to support this, it may be surmised that the new system of town fortifications was built during this period. The defensive line of that time, the upper town wall that originated in the 14th century, no longer satisfied the defence requirements of that age and was threatened by construction on adjacent lots (for more see *Razím 1995*, 10). In addition to defensive needs in the context of contemporary events, the symbolic aspect of this defence work should not be overlooked. Around the middle of the 15th and up to the 16th century, outer ward

Note 8:
Worth noting in this context is that in 1491 the Hradec town council adopted a building code (*Mikulka 1996*, 175).

walls were reinforced and reconstructed in other Czech towns (the semi-cylindrical towers were rounded out) or new wall circuits were built (for a summary see *Líbal 1960*, 152-155, 157-163; *Menclová 1950*, 218-220). For example, in Litoměřice construction was begun in 1531 on a new outer fortification structure, and at that same time semi-circular bastions were added to the local outer ward wall (*Kotyza – Smetana – Tomas et al. 1997*, 156). Similarly, in Louny in the second half of the 15th century, semi-circular bastions were added to the outer ward wall (*Kolektiv autorů 2005*, 100). In Chrudim a outer ward wall was built around the year 1435 (*Musil 2005* 80). All this construction work can to some degree be regarded as the final attempt to bring the needs of the towns' defence into line with contemporary developments in military science. However, given the rapid advances in artillery techniques, even these fortifications quickly fell out of date as fortification methods progressed in a new direction. In 1547 Hradec Králové, like most of the other (royal) towns, saw its property confiscated owing to participation in the Estates Uprising, and the execution of construction in this sphere during the subsequent period was out of the question.

7. Conclusion

The fortifications of the Eastern Bohemian town of Hradec Králové were extended in the second half of the 15th and the early 16th centuries with the addition of two wall circuits. One was the outer ward wall, reinforced with U-shaped bastions and located in the upper part of the southern incline of the plateau on which the town was situated. The lower town wall was a simple brick wall fortified with U-shaped (semi-cylindrical) and square bastions, usually located close to the town gates. The origin and development of these fortifications can be studied using iconographic sources (townscapes from the 17th-18th centuries), cartographic sources (towns plans and maps dating mainly from the 18th century), written sources, and finally archaeological sources. An important source of information are the finds of architectural building features from the early and Gothic periods, re-used as building material in the masonry of the lower town wall. The reason for the construction of new fortifications was the fact that the previous defence line – the upper town wall dating from the 14th century – no longer adequately fulfilled the demands of contemporary defence. The late 15th and early 16th centuries were a period of political conflict between the royal towns and the nobility, and there may even have been a symbolic aspect to the construction of new defence lines around the town at that time.

Attention should be paid to the origin and development of the town fortifications in Hradec Králové. Historical building research of the preserved parts of the town walls is especially necessary, including an analysis of the construction materials used (mortars, bricks, architectural mouldings, etc.). Many of the surviving written sources on the early modern period (town accounts, etc.) have also yet to be adequately exploited. Finally, new information could certainly be obtained from an analysis of materials from older and more recent archaeological excavations, and potentially also from new (rescue) excavations in the area of the wall circuit.[9)]

Note 9:
In the years 2003, 2004 and 2006 alone a complete reconstruction of three roughly 10-metre-wide sections of the lower town wall on Komenského Avenue was carried out for structural safety reasons. At that time approximately 90 pieces of re-used Gothic sandstone architectural mouldings were discovered. In 2006 and in subsequent years reconstruction was and will continue to be carried out on the wall circuit (terraces) on the northern and southern sides of the Hradec plateau.

Resumé:

V období druhé poloviny 15. a počátku 16. století vznikly v Hradci Králové vedle starší horní městské hradby další dvě linie městského opevnění, a to hradba parkánová a dolní městská hradba v horní části svahu hradeckého návrší a při jeho patě.

Při studiu pozdně středověkého opevnění města Hradce Králové lze využít vedle výsledků archeologických výzkumů a terénních pozorování především prameny ikonografické, kartografické a písemné. Nejstarším ikonografickým pramenem je dvojice Willenbergových vedut z přelomu 16. a 17. století (*obr. 1*). Wernerova veduta města z roku 1740 (*obr. 2*) ukazuje vzhled města od severozápadu, ovšem právě hradby jsou zachyceny s určitými nepřesnostmi a zjednodušeními (edice viz *Doubrava 1971*; rozbor viz *Richter – Vokolek 1995*, 108). Velkou informační hodnotu má soubor plánů souvisejících již s přípravou a realizací přestavby Hradce na pozdně barokní bastionovou pevnost ve druhé polovině 18. století (*obr. 3*; edice viz *Richter – Semotanová 1998*).

Prameny písemné reprezentují, především v době předhusitské, relativně četné panovnické listiny a privilegia, které se obecně zmiňují o hradbách a opevnění města (např. v letech 1321, 1364, 1378 – *Mikulka 1996*, 32, 35, 37). Zlomek rejstříku purkmistrovských výdajů z roku 1504 uvádí opravy Soukenické fortny (v jihozápadní části města) a stavbu bašt v prostoru pod hradem (*Mikulka 1996*, 167). Obrozenecký dějepisec Hradce Králové F. Švenda přináší (z dnes již fyzicky zaniklých pramenů) údaje o stavbě dvou bašt mezi Mýtskou bránou a Kavčím pláckem ve východní části města v letech 1543 a 1544 (*Švenda 1802*, 32, 38). Další bližší zmínky o hradbách pocházejí až z období 17. a 18. století (oprava hradeb – všech tří pásem? – k roku 1674, pronajmutí parkánů měšťanům roku 1718 atd. – viz *Mikulka 1994*, 124).

Hradba parkánová (*obr. 4*) obepínala hradecké návrší především na jeho jižní straně, asi 6-10 m před horní městskou hradbou. Willenbergova veduta i plány z 18. století ukazují, že tato hradba začínala na jihozápadní straně města v prostoru Kozí branky (Soukenické fortny), prolomené v horní městské hradbě. Zde stávala čtverhranná nízká věž s průchodem. Od ní pokračovala hradba dále k jihu, respektive jihozápadu, poté se lomila ostře k východu. Na tomto lomu a v jeho těsné blízkosti ji zesilovaly dvě půlkruhové, do města otevřené bašty. Hradba pokračovala dále podél jižní hrany návrší se dvěma dodnes zachovanými půlkruhovými baštami pod kanovnickými domy čp. 50 a 46. Další podkovovitá bašta ležela za čp. 37 a 38. V prostoru biskupství (čp. 34) a sousedící jezuitské koleje a kostela Nanebevzetí P. Marie bylo celé hradební pásmo během 17. a 18. století upraveno na zahrady. Starší stav tak ukazuje jen Willenbergova veduta, na které vidíme jižně od jezuitské koleje dvě okrouhlé bašty či věžice. Mezi biskupstvím a jezuitskou kolejí byl již ve středověku průchod ven z města zvaný Biřická nebo také Rybářská fortna či branka, na počátku 19. století zde vzniklo schodiště Bono Publico. Průchod skrze parkánovou hradbu zde zajišťovala (dle Willenbergova vyobrazení) čtverhranná věž či bašta. Další bašta ležela dále na východ za čp. 29, v těsné blízkosti vodní věže Kropáčky. Willenberg zachytil před touto věží poměrně rozsáhlý, zřejmě pravoúhlý „baštovitý“ výstupek. Průběh hradby dále směrem k Mýtské bráně není z pramenů zcela zřejmý: většina plánů z 18. století ukazuje, že již v této době zde byla hradba rozebrána, její průběh naznačuje jen konfigurace terénu; hrana návrší a s ní i hradební zeď se zde stáčely směrem k severovýchodu a parkánovou hradbu tu zesilovaly nejméně tři bašty. Rovněž nejasná je situace při Mýtské bráně. Střední věžová brána s padacím mostem totiž zřejmě stála až v dolní městské hradbě (*Slavík 2004*, 267, uvádí, že ležela při parkánové hradbě), jak napovídají historické plány. Za Mýtskou bránou se parkánová hradba stáčela po hraně návrší směrem k severu a k severozápadu a končila baštou za Kavčím pláckem, severovýchodně od Malého náměstí. Mimo ní Pierkerova mapa z roku 1756 zachycuje jen další baštu za čp. 126. Jedná-li se o bašty budované v letech 1543 až 1544 (dle výše uvedených zmínek písemných pramenů) není jisté, je to však pravděpodobné.

Co se týká vzhledu parkánové hradby a bašt, Willenbergova veduta zobrazuje hradbu jako nízkou zeď s řadou otvorů v horní části – snad se jedná o střílny – a bez cimbuří. Bašty jsou zobrazeny jako půlválcové, patrové, s okénky či střílnami nad sebou a s kuželovitou střechou.

Dodnes viditelné zbytky parkánové hradby, a to především dvě z bašt v novější době přezděné, se dochovaly na jižní straně města, za zadními trakty kanovnických domů čp. 50 a 46 (*obr. 6*). Archeologicky parkánová hradba až do zcela nedávné doby podrobněji zkoumána nebyla, vyjma sond za čp. 45 a čp. 2 z přelomu 60. a 70. let 20. století. Zcela nejnověji byl její cca 50 m dlouhý úsek sledován v rámci předstihového záchranného archeologického výzkumu při přestavbě bývalého pivovaru v letech 2004-2006. Zde se podařilo odhalit jednu baštu podkovovitého půdorysu (*obr. 7*). Tloušťka

jejího zdiva činila cca 80-100 cm, dochovaná výška byla cca 2 m, poloměr oblouku bašty měřil cca 2,5 m. Lámané ploché opukové kameny spojovala poměrně kvalitní vápenná malta. Vnější líc bašty souvisle pokrývala vrstva omítky. Ojediněle se mezi opukou objevily i zlomky cihel gotického formátu („buchet") s prstovaným povrchem (maximální dochovaný rozměr hran cihel činil 10 cm). Mimo bašty se podařilo odkrýt pokračování samotné hradby, a to jak směrem na jihovýchod, tak na severovýchod. Hradba byla zděna stejným způsobem jako bašta; mezi baštou a hradbou výzkum neprokázal ve zdivu spáru, která by naznačovala, že bašta byla do hradby včleněna dodatečně. Dochovaná výška hradební zdi činila cca 20-120 cm v závislosti na terénním reliéfu a stupni recentního poškození. Hradební zeď šla dále severovýchodním směrem až k věži Kozí branky, kde v ní byl prolomen vstup (asi formou věžovité branky), jak dokazuje část zde odkrytého, v tupém úhlu zalomeného zdiva, a jak naznačuje i výše uvedená Willenbergova veduta (*obr. 8*). Bohužel další pokračování hradby bylo v novější době zcela zničeno. Dle předběžně datovaných zlomků keramiky a několika drobných mincí nalezených v kontextech přímo souvisejících se zdí lze počítat s vybudováním této části hradeckého městského fortifikačního systému ve druhé polovině 15. či na počátku 16. století. Byl také zjištěn možný předchůdce parkánové hradby, a to žlab široký v průměru 50 a hluboký cca 100 cm, který půdorysně přesně kopíroval směr hradby (*obr. 9*). V jeho výplni byly nalezeny četné zlomky opuky a pravěké keramiky včetně několika atypických zlomků snad vrcholně středověkých. Žlab snad mohl sloužit jako základ pro dřevěnou palisádu.

Dolní městská hradba obíhala patu návrší po celém jeho obvodu (*obr. 4*). Willenberg ji zobrazuje jako prostou zeď s cimbuřím a střílnami, jen na několika místech zesílenou věžemi a baštami. Na nejzápadnější straně návrší, pod dnešním děkanstvím (čp. 58), z jejího líce vystupoval pouze nevýrazný čtvercový baštovitý výstupek. V ohybu hradby k jihu a posléze k jihovýchodu, pod dnes již bývalým pivovarem, byla ve zdi branka, kterou procházela šikmo do svahu cesta směrem k Soukenické (Kozí) brance. Za ní v malých rozestupech byla hradba zesílena třemi půlválcovými baštami (poslední z nich pod čp. 51). Jedna z těchto bašt (nejzápadnější) byla přebudována, zřejmě v době stavby barokní bastionové pevnosti, na vápenku. Dále k východu hradbu zesilovala čtverhranná bašta, zhruba pod čp. 45. Další stála těsně vedle průchozí branky dnešního schodiště Bono Publico; bašta je zde patrná dodnes. Od Rybářské fortny až k Mýtské bráně byla v hradbě zřejmě jen jediná čtvercová bašta jižně od čp. 6. V Mýtské bráně na dolní městskou hradbu navazovala prostřední věžová Mýtská brána, zničená již za třicetileté války (o bráně viz *Slavík 2004*, 267). Od ní běžela hradba dále při patě svahu nejprve k severovýchodu a poté se prudce stočila k severozápadu. Historické plány zde nezobrazují žádnou věž ani baštu, hradba byla z vnější strany zesílena pouze řadou opěrných pilířů. Na severní straně města byla hradební linie již v 18. století přerušena (zřícením ze statických důvodů?). Pod bývalým hradem se hradba stočila k jihozápadu, k Pražské bráně. V tomto úseku ji zesilovala mohutná čtverhranná věž. V prostoru Pražské brány bylo v linii dolní městské hradby postaveno renesanční ozdobné předbraní (k bráně a předbraní viz naposledy *Slavík 1998*, 184-191). Některé plány z 18. století ukazují, že jižní křídlo dolní městské hradby se před Pražskou bránou poněkud vyklonilo směrem k západu a krylo tak přístupovou cestu z Pražského předměstí. Jakýsi baštovitý výstupek či bastion zde na svých vedutách zachytil i Willenberger, a proto je možné uvažovat o jeho vzniku již v době vybudování renesančního předbraní.

Dodnes viditelné relikty hradby využité jaké opěrná zeď se dochovaly především na jižní straně města; na částech základů hradby (v jižní části dnešní třídy ČSA) stojí od závěru 19. století domy a jejich dvorky.

Archeologicky byla dolní městská hradba zkoumána či dokumentována na několika místech. Lze zmínit archeologický výzkum provedený na počátku roku 2001 v čp. 81 v dolní části ulice V kopečku. Bývalý pevnostní objekt využil dolní městskou hradbu jako východní základovou zeď. Líc zdi dolní hradby se dochoval až po podlahu přízemí; v základových partiích zdi (vystavěné z cihel gotického formátu o velikosti 26-27 x 13 x 8-9 cm) bylo v délce cca 10,5 m zjištěno tři až pět řad sekundárně použitých architektonických kamenných článků z období 13.-14. století (*obr. 10*). Období její výstavby datuje jednak zásyp příkopu (ze 14. století), ale především druhotně použitý stavební materiál v základech zdi: pískovcové architektonické články pocházejí s největší pravděpodobností z několika destruovaných, snad církevních staveb. V historii Hradce Králové existují dvě období hromadného zániku sakrální architektury: husitské války a výstavba bastionové pevnosti ve 3. čtvrtině 18. století. Vzhledem k tomu že mezi použitým stavivem jsou výhradně prvky datovatelné do období rané a vrcholné gotiky, je pravděpodobnější první z uvedených období. Tím by bylo možno výstavbu tohoto úseku dolní hradby datovat nejdříve do období 2. čtvrtiny 15. století (*Bláha – Slavík 2002*; *Slavík – Sommer 2001*).

V roce 2002 byl proveden záchranný archeologický výzkum v jižní části hradebního pásma nad Komenského třídou. V úseku mezi Gočárovým schodištěm a schodištěm Bono Publico bylo prováděno statické zabezpečení dolní opěrné zdi,

využívající jako základu hradební zeď. Stavebními výkopy a archeologickými sondami byla obnažena hradba v celé výšce a bylo možno alespoň rámcově určit hlavní stavební fáze. V první fázi byl vystavěn vlastní základ vysoký minimálně 120 cm, vyzděný z nepravidelně lámané opuky a cihel, bohatě prolitý maltou (*obr. 11*). Na tento základ s nepatrným odskokem (cca 5 cm) navazovala zeď o dochované výšce cca 95 cm, z pravidelných řádek gotických cihel spojených kvalitní jemnozrnnou maltou. Na některých místech byly místo cihel použity pískovcové kvádry. Na jiném místě bylo ve zdivu hradby druhotně použito pískovcových architektonických článků (*obr. 12*). Ve zdivu byly také na dvou místech zachyceny části dvou nálevkovitých střílen (*obr. 13*). Celá zeď včetně základu se od svislé osy vykláněla v úhlu cca 10-15 stupňů, a to vlivem pozdějšího přisypávání zeminy za rub zdi. Z nejspodnějších vrstev přiléhajících k vnitřnímu líci hradby byla získána keramika, široce datovatelná do 15.-16. století (*obr. 14*; *Bláha 2003*).

Dolní městská hradba byla dále zkoumána roku 2003 v souvislosti s přezdíváním jejího cca 8 m dlouhého úseku v Komenského ulici proti Střední zdravotnické škole. Při tom bylo zejména z jejich základů získáno na 30 druhotně použitých pískovcových gotických článků (žebra, ostění, kružby atd.; ty lze datovat stejně jako architektonické články z čp. 81) a následně se podařilo zdokumentovat podélný a příčný řez celou situací o celkové délce 12 a výšce 6 m.

Spodní část zdi, tvořená lámanou opukou a již zmíněnými druhotně použitými architektonickými články, byla založena do slínového podloží. Následovala sekvence víceméně vodorovných uloženin zásypu z vnitřní strany zdi. V horních partiích byla hradba zbudována z cihel gotického formátu (cca 25-27 x 12 x 9 cm), na horním líci brázděných podélnými žlábky (prstováním). Ve vyšších partiích zdi tvořily kusy pískovce její vnější líc. Jako pojivo sloužila vápenná malta s hrubými zrny písku, ojediněle ostrohranného štěrku. V horních částech více než 4 m vysoké zdi byly patrné novověké přizdívky, nápadně se lišící velikostí cihel (27,5 x 13 x 6,5 cm) a použitím vápenocementové malty. Nejnápadnějším znakem zkoumané zdi byl její značný náklon směrem k jihu, tedy do Komenského třídy (*obr. 15*). Z tohoto důvodu byly v nové době před líc zdi předsazeny opěrné pilíře. Tyto pilíře částečně porušily severní hranu zasypaného příkopu či terénní sníženiny, probíhající před hradební zdí. Z uloženin přiléhajících ke zdi (které svým tlakem způsobily její vyklonění) byly získány keramické zlomky především ze 16.-17. století (*Bláha 2004*, 185-187, 211).

Další úsek dolní městské hradby byl dokumentován roku 2004 při stavbě nového domu na parcele 302/1 na třídě ČSA, severovýchodně od schodiště Kozinka. Relikty zdiva dolní městské hradby ve směru jihozápad – severovýchod protínaly staveniště budoucího objektu. Dochovaná maximální výška zdi činila cca 3,5-4 m od úrovně okolního terénu, šířka zdi v úrovni terénu byla cca 1 m, ve výšce cca 3 m pak okolo 70 cm. V této úrovni byl z vnitřní strany zdi patrný pravoúhlý ústupek hluboký asi 40 cm, který by mohl být pozůstatkem ochozu (*obr. 16*). Šířka dochované koruny zdiva tak činila jen cca 30 cm. Jako stavební materiál bylo použito cihel gotického formátu (cca 26 x 12 x 10 cm), místy se vedle cihel objevila lámaná opuka či opukové kvádry. Stavební materiál byl spojen kvalitní vápennou maltou. Oproti jiným sledovaným úsekům tohoto opevnění nebyly registrovány druhotně použité gotické pískovcové architektonické články. Z vrstev, které přiléhaly k hradbě ze strany svahu, se podařilo získat zlomky keramiky ze 16.-18. století.

Bylo již řečeno, že prameny písemné neposkytují pro datování výstavby parkánové hradby a dolní hradby žádné přímé údaje, avšak prameny ikonografické (Willenbergovy veduty) spolehlivě umožňují datovat jejich výstavbu před rok 1600. Nejmladší keramické nálezy získané ze spodních vrstev zásypu základů obou hradebních zdí musíme datovat do širšího rámce pokročilého 15. až první poloviny 16. století. Stojí za pozornost, že především na počátku 16. století probíhala v Hradci Králové zvýšená stavební aktivita, kterou potvrzují i výše uvedené písemné prameny (viz zmínky o stavbách a opravách hradeb 1502 a 1504). Stavební práce byly také vyvolány častými požáry města právě v této době (*Mikulka 1996*, 39, 175; *1997*, 355). Počátek 16. století je ve znamení vrcholícího zostřeného politického zápasu královských měst se šlechtou a je možné vyslovit domněnku, že stavba nového městského opevnění proběhla právě v této době. Dosavadní obranná linie – horní městská hradba, původem ze 14. století, již v této době nevyhovovala nárokům obrany a byla navíc ohrožována a znehodnocována měšťanskou zástavbou přilehlých parcel (k tomu viz *Razím 1995*, 10).

Nelze pominout, že v období kolem poloviny 15. až počátku 16. století je i v jiných (hlavně královských) městech (např. Chrudim, Louny, Litoměřice a mnohá další) přestavována parkánová hradba a/nebo stavěna nová linie obranného pásma –hradba opatřená střílnami a zesílená dělovými baštami (*Kolektiv autorů 2005*, 100; *Kotyza – Smetana – Tomas a kol. 1997*, 156; *Líbal 1960*, 152-155, 157-163; *Menclová 1950*, 218-220; *Musil 2005*, 80).

Roku 1547 byl Hradec Králové spolu s většinou ostatních královských měst postižen konfiskacemi majetku za svou účast ve stavovském povstání a realizace staveb tohoto druhu v následujícím období již nepřipadala v úvahu.

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Baroque town house in Frývaldov

Barokní měšťanský dům ve Frývaldově

Ein Barockes Bürgerhaus in Frývaldov

Peter Kováčik

Bei der Grabung wurde der Raum von zwei frühneuzeitlichen Parzellen abgedeckt, auf denen zwei aus Stein gemauerte Keller dokumentiert wurden. Keller I war dreiräumig, die Treppe und der Mittelteil C dienten als Eingangsraum in die Kellerräume, die zwei verschieden großen gewölbten Räume A und B dienten als eigentliches Lager. Überrest des Kellers von Haus II mit flacher Decke waren die Mauern Nr. 918 und 919. Aufgrund älterer mittelalterlicher Keller in der Umgebung geht die Parzellierung offensichtlich auf eine ältere Tradition zurück.

Introduction

Archaeology has thus far paid little attention to the smaller historical towns in the Czech part of Silesia, despite the fact that in recent years there has been an increase in the intensity of construction in this region, and this has led to the destruction of many surviving archaeological records. One reason for this lack of attention is that the region is hard to reach, and the scope of authorized archaeological organizations is limited. Another is the lack of experience on the part of local builders, who are often also the local authorities themselves. Yet an understanding of the historical development of small towns – obtained with the aid of archaeological excavations – has proved essential. Jeseník (formerly Frývaldov) is one striking example of this fact.

Frývaldov arose in a strategic location, at the confluence of the Staříč and the Bělá Rivers. The course of these two mountain streams essentially shaped the basic layout of the roads and settlements in this region. The Jeseník Region was connected with Bohemia to the southwest and Moravia to the south by routes leading upstream through the Staříč and Bělá River valleys and through the Ramzovské and Červenohorské Mountain saddles. A natural route following the course of the Bělá River northward linked the region to other parts of Silesia. The valley of the Bělá River is lined by the Rychlebské Mountain ridge to the northwest and the Zlatohorské Highlands to the east. The river basin is, on average, 300-400 metres above sea level, and the surrounding mountain peaks reach heights of over a thousand metres. The Bělá River forms the roughly south-north longitudinal axis of the valley, and to the north it spreads out into the Silesian plateau.

An excursion into history

Colonisation of this region was organized by the bishops of Vratislav. It naturally proceeded from the north, from within Silesia. The main protagonists in the process were primarily German-speaking settlers.

The earliest period of the settlement of Vriwald is dated to the late 13th century, and it may have been the centre of a parish of several villages governed by the local *Vogt* (*Kuča 2000*). From the time of its origin it was a small town, without town walls, and from the 14th century it was based around a moated fort (*Goš 1977*, 34-35). In the early 14th century the prince-bishopric was one of the principalities in Silesia that became part of the Lands of the Czech Crown. Iron ore mining played a key economic role in this region. In the area around Frývaldov there are remnants of forges. At the end of the 14th century Frývaldov iron was exported across Poland as far as England (*Vojkovský 2004*, 9). The Frývaldov iron industry later subsided amidst the chaos brought by the Hussite Wars (*Kouřil – Prix – Wihoda 2000*, 540-541; *Vojkovský 2004*, 8; *Žáček 2004*, 100-114). Mining began to flourish again at the end of the 15th century, and in 1506 the town was even granted extensive privileges and a mining statute. In the mid-16th century mining activity definitively wound down, forcing the local population to turn to textile (linen) production, and other sectors of the economy began to develop, such as the blacksmith, locksmith, and wheelwright trades, logging, lime processing, and even agriculture. The landscape changed dramatically; the forests were cut back and were replaced with more and more fields, meadows, and pastures.

During the Thirty Years War the armies of the warring sides passed through the town, imposing war contributions on the population. These horrors of war, combined with the economic decline in the Jeseník Region, formed the backdrop to a series of witch trials that resulted in hundreds of victims (1622, 1636-48, 1651-52, 1683-84). Alongside this were the frequent unpleasant events that occur in the life of any historical town, like fires (1625, 1638, 1641) and, for instance, cattle plague (1622).

At the turn of the 18th century the town's inhabitants began increasingly to engage in trade, handicrafts, and agriculture. In 1696 the local cloth dye-works was turned into a paper mill. The moated fort was given a more palatial appearance, and the centre of economic activity became its adjacent service court. Another disastrous fire occurred in 1696, after which townspeople residing by the square re-built their homes using stone. But wooden homes continued to exist for a long time in the outskirts of town. In 1713 the population was struck by the plague, and in 1727 and 1737 again by fires.

In 1741 the War of the Austrian Succession broke out, during which most of Silesia was seized by Prussia, and only a smaller area remained under Austria. This resulted in Frývaldov and other local towns being cut off economically from their natural markets in the Nisa Region, and despite the Habsburgs efforts not even the Seven Years War altered this situation. The tangible impact it had on the population in the Austrian part of Silesia was the destructive hardships of war – hunger, illness, and rising prices. The area of Frývaldov increasingly came to resemble a forgotten borderland district. After 1770 textile production developed on a massive scale in the town, and in the following century Frývaldov's spa industry began to flourish.

Archaeology in Jeseník

After the Second World War and the expulsion of the German population massive reconstruction took place in the town, though unfortunately without the involvement of archaeologists. Sporadic archaeological rescue excavations took place in connection with repairs carried out on the moated fort in the 1970s (*Goš 1977*; *1978*; *1981*) and later during the construction of other

structures in the town (*Brachtl – Dohnal 1992*). However, with just a few exceptions (*Vrána 2005*), no archaeological excavations have been carried out in the past fifteen years.

The archaeological rescue excavation that was supposed to be carried out in October 2005 in connection with the construction of the Multifunctional Travel and Spa Centre, located next to the former Hotel Slovan, seemed therefore to be a good opportunity to deepen our knowledge of the history of the town. However, the excavation was done under considerable time constraints, as the building permit did not contain any requirement to facilitate archaeological rescue excavations, even though the location is on territory containing archaeological finds, and subsequent work proved that excavations were warranted. Owing to these "external" circumstances, the task of the excavation was mainly to document at a basic level the archaeological record that would be disturbed by the building project. The actual fieldwork of the archaeological excavation involved digging thirty trenches in the accumulation points of the building project's foundation piles. Depending on the situation, some of the trenches were then expanded in order to obtain a clearer picture of the archaeological contexts that were excavated and to verify their dating and stratigraphic relationships.

The site occupies the area of two early modern town lots, located in the proximity of Masaryk Square (Masarykovo náměstí), which since mediaeval times has been the main marketplace of the town formerly called Frývaldov. The history of the built-up area on the square should consequently from the start be closely connected with the urban development of the town. The lots were situated where Palacký Street today opens onto the square. The street connected the town's parish church, the Church of the Assumption of Our Lady (kostel Nanebevzetí Panny Marie), and the moated fort to the square (*figs. 1, 2*). The site lies on relatively level terrain, about 341-342 metres above sea level, on a kind of spit enclosed by the Bělá River and its left-bank tributary the Staříč River. The terrain dips here very slightly in the northern, downstream direction. During construction work a record was made of the geological substrata, consisting of quaternary river sands and gravel. The type of soil assumed to exist here was no longer present, evidently as a result of the medieval and early modern landscaping works.

Fig. 1. View from the northwest of the excavation site, with the Church of the Assumption of Our Lady in the background; on the right is the former Hotel Slovan.
Obr. 1. Pohled od severozápadu na plochu výzkumu s kostelem Nanebevzetí Panny Marie v pozadí, vpravo bývalý hotel Slovan.

Fig. 2. Plan of the town of Jeseník. Detail of a map sheet from the state map no. 14-22-24, 1 : 10000; the excavation site is marked out in red.
Obr. 2. Plán města Jeseník. Výřez z mapového listu státní mapy 14-22-24, 1 : 10000; plocha výzkumu vyznačena červeně.

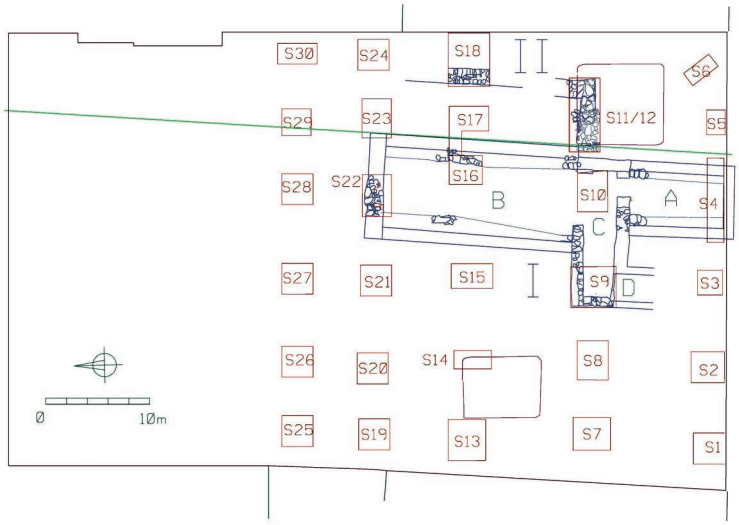

Fig. 3. Arrangement of trenches S1 to S30. The ground plan of the two mediaeval cellars is indicated in purple, the Baroque cellars of buildings I and II are in blue, and the green line indicates the lot perimeters.
Obr. 3. Rozvržení sond S1 až S30. Fialově půdorys dvou středověkých suterénů, modře barokní suterény domů I a II, zelená linie – parcelní hranice.

Fig. 4. The southern face wall of the stone cellar of the building (area A) with the windowsill and the negative traces of the cellar vaulting.
Obr. 4. Jižní čelní stěna kamenného suterénu domu (prostor A) s bankálem a negativem klenby sklepa.

Archaeological context

The oldest settlement horizon on the lot can be dated to the 14th century and is represented by the remains of what were evidently two dug-out cellars of wood and clay buildings and the related remains of mediaeval formations (*fig. 3*).

The second significant structural and settlement horizon on the site dates from the 17th-18th century, which is the date of the construction of stone building no. I, the remains of which were excavated (*fig. 3*). The aboveground part of the built-up area on the lot was unfortunately demolished in the 1970s, without any historical-structural documentation, so the building can only be described on the basis of the surviving cellar section.

The lengthwise axis of the building's cellar was turned perpendicular to Palacký Street, with its southern face aligned with the street. The cellar was approximately 17.6 metres long and 5.1 metres wide, and was divided into three sections.

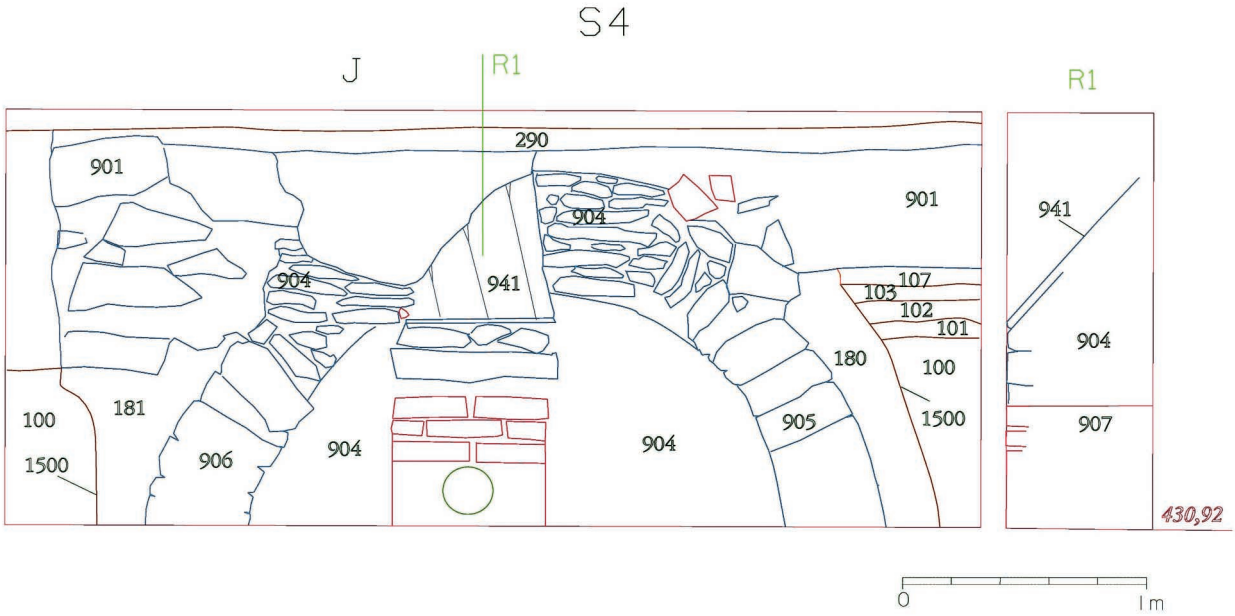

Fig. 5. Section on the line of the southern face wall of the cellar (904) with the windowsill (941) and vaulting (905, 906).
Obr. 5. Řez v linii jižní čelní stěny sklepa (904) s bankálem (941) a klenbou (905, 906).

Southern section A, 3 metres in length, ran adjacent to the street alignment, the course of which has changed little over the centuries. Despite some damage that occurred as a result of recent concrete grouting and sewerage work, the wall of the southern face retained a nice architectural detail – the slanted windowsill of the cellar window (context no. 941; *fig. 4, 5*). The sides were marked out by the remains of the cellar vaulting (wall no. 905 on the west and no. 906 on the east), the extension of which almost up to the crown of the vault was evident from the negative traces on the southern face wall of the cellar (wall no. 904). We were unable to determine the level of the floor in this section. Assuming that it was similar to the central and northern sections, the estimated height of the southern section A could be 1.8 metres.

Southern section A of the cellar was separated from central section C by a pier protruding from the eastern outer wall no. 924 and its opposite pier, the continuation of the outer wall of staircase no. 921. Both piers terminated in a haunch on the arch ring. This ring spanned the 0.9 metre wide entrance into the southern area of the cellar. On the second pier the original iron door hinge was discovered. The door leading from the central section into the southern section opened to the right and into the southern section of the cellar.

Central section C was 2.6 metres wide and approx. 1.5 metres long. The area was thus laid out on a lengthwise east-west axis, i. e. perpendicular to the lengthwise access of the building as a whole. This central section was higher than 1.64 metres. Based on the archaeological context, the existence of vaulting can be assumed or, unusually, a flat ceiling.

Central section C led into northern section B through an entrance 2.5 metres in width, which was also spanned by the arch ring. The door opened to the right and into the northern section of the cellar, which is again evident from the iron hinge. The northern section B was the largest, with a length of approximately 9 metres, an estimated width of 3.6 metres, and an estimated height of around 1.7 metres (*figs. 6, 7*). In the northern face wall the stepped windowsill of the ventilation window was preserved, around 0.75 metres wide, at least 0.35 metres high, and 0.3 metres deep.

Fig. 6. View of the destroyed vault in the northern section of cellar B.
Obr. 6. Pohled na destruovanou klenbu severní části sklepa B.

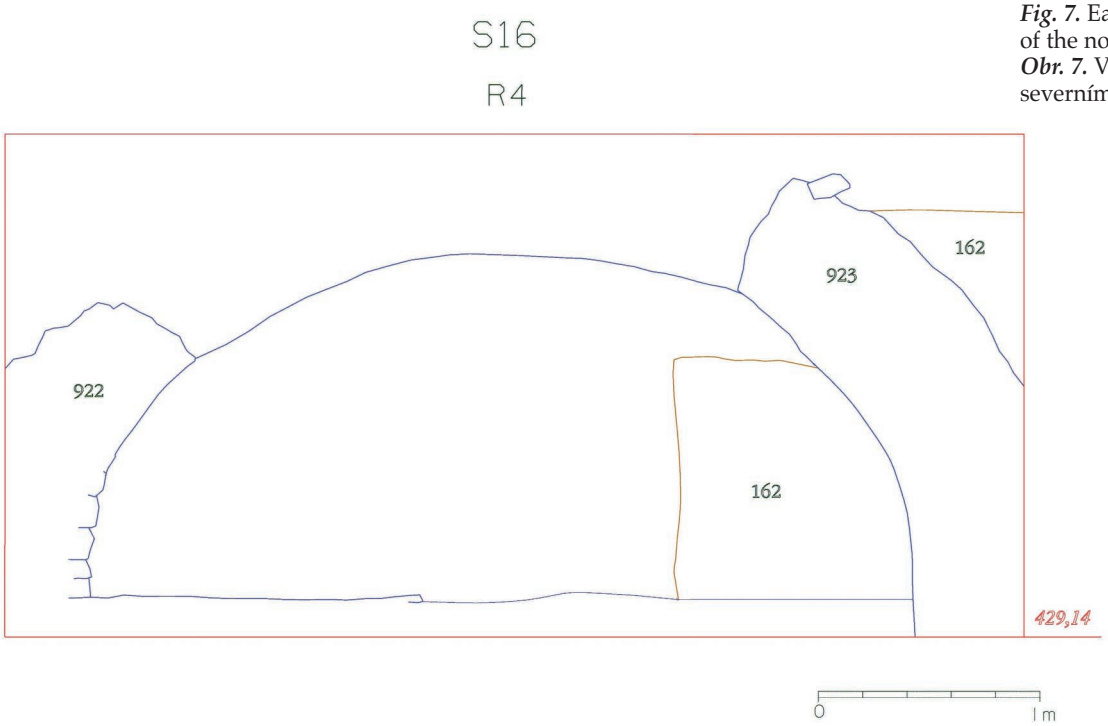

Fig. 7. East-west section of the northern cellar (area B).
Obr. 7. Východo-západní řez severním sklepem (prostor B).

Fig. 8. The niche in the northern outer wall in the area of staircase D.
Obr. 8. Nika v severní obvodové zdi prostoru schodiště D.

Central section C was reached through staircase D, which was entered from the area of the courtyard. The entrance to the staircase was from the south; the staircase then turned to the right to enter into the central part of the cellar from the west. In the northern outer wall a recessed niche for light was discovered (*figs. 8, 9*). The staircase was walled at the area of the bend of the staircase, probably sometime in the 20th century. The north-south hall of the staircase was approximately 1.3 metres in width, but its total length was not ascertained. The width of the hall after the bend was approximately 1.5 metres and the length approximately 3.4 metres.

The excavation thus made it possible to uncover the layout of the Baroque building's stone cellar, which was divided into three areas. One area, the staircase, and central section C served as access to the underground cellar, and the two other spaces of differing size, sections A and B, served as storage spaces. In this regard the question arises as to whether the different sizes of the northern and southern sections of the cellar and the different widths of the entrances into these sections is connected with their different functions, or whether they were built at different stages. The identical character of the brickwork and the overall archaeological context are more suggestive of a single period of construction.

A considerably more complicated question is the appearance of the aboveground section of the building. Based on the remains of the cellar vaulting it was not possible to determine any (not even negative) traces of the aboveground outer walls of the building, which means that the aboveground structure may have been constructed of wood.

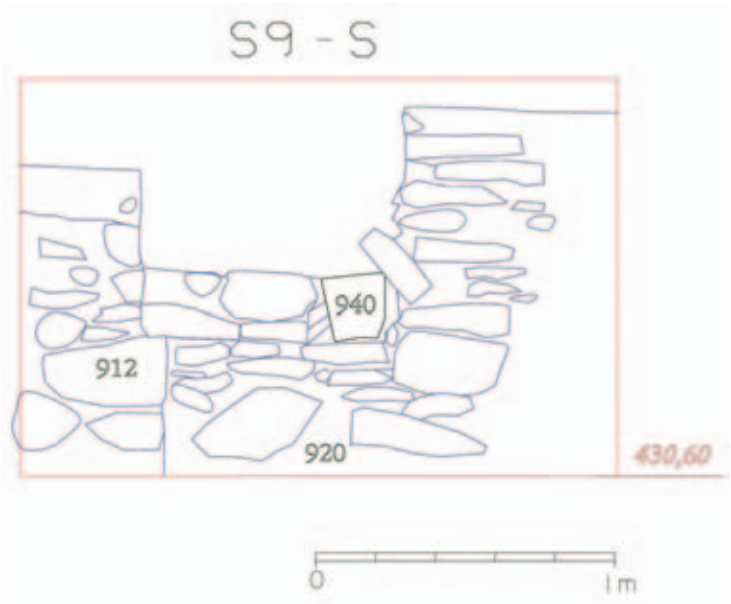

Fig. 9. View of the northern outer wall of the staircase with the recessed niche (940).
Obr. 9. Pohled na severní obvodovou zeď schodiště s odkládací nikou (940).

According to the layout of the cellar, and especially the location of the staircase, we can judge that the courtyard attached to building no. I lay to its west. The width and length of the lot cannot at present be determined on the basis of archaeological findings.

In the early modern period the area east of the building belonged to another lot, which advanced even beyond the adjacent building still standing today. During the excavation it was possible to uncover part of building no. II, which stood on the adjacent lot. A remnant of the building is wall no. 918 in trench S18. This was the western outer wall of the stone building, which, at least at this part, had a flat ceiling. It is interesting that in terms of its position and location the wall matched with wall no. 919, documented in trench S11, which, however, was different in character. In the case of wall no. 918 this may be a later construction stage – a continuation of wall no. 919, indicating perhaps the extension of the building's older wall.

A connection can probably be drawn between two pits for storing lime that were discovered and the stone cellars described above. Based on stratigraphy and a small number of material finds, the pits can also be dated to the 17th-18th centuries, and they may be connected with the construction or reconstruction of the walled stone building. Simultaneous settlement activity in the locality is also evident from the approximately 0.3-0.5 metre thick horizons.

Summary

The excavation uncovered the area of roughly one whole lot and one-half lot dating from the early modern period. The lot perimeters were most likely aligned with the eastern outer wall of the excavated building no. I. Sometime in the 17th or 18th century the stone cellars of the buildings, with the lengthwise axes perpendicular to the street, were built on these lots. Whether this layout reflects the division of lots of the medieval period cannot be reliably proved, but the layout of the two excavated remains of clay and wood cellars suggests this.

The results of the archaeological excavation show that the presence of an archaeologist in the historic core of a town is necessary on every construction or digging project. It also showed that when the correct research method is used and when a qualified team of researchers are in place it is possible, even under very inauspicious circumstances, to record an enormous amount of information from an excavation, which can then be used not just to provide a clearer idea of settlement's history at the target site, but also to enrich our information about the urban development of the town of Jeseník.

Resumé:

Jeseník (někdejší Frývaldov) vznikl na strategickém místě při soutoku Bělé a Staříče. Proti směru jejich toků bylo Jesenicko spojeno přes Ramzovské nebo Červenohorské sedlo s okolními oblastmi Čech a Moravy na jihu, po směru toku Bělé s oblastmi Slezska na severu. Hlavními protagonisty kolonizace regionu organizované vratislavskými biskupy byli německy mluvící kolonisté. V závěru 13. století se zde počítá s osadou „Vriwald" – snad střediskem okrsku několika vsí, spravovaného zdejším fojtem (*Kuča 2000*). Město od počátku patřilo k těm menším, nikdy nemělo hradby, jeho opěrným bodem byla od 14. století vodní tvrz (*Goš, 1977*, 34-35). Rozhodující ekonomickou roli zde hrála těžba rud, především železa. Po polovině 16. století dochází ke konečnému útlumu těžby, kterou nahrazuje hlavně textilní výroba. Po třicetileté válce, sériích čarodějnických procesů a několika požárech se město znovu pomalu ekonomicky rozvíjelo, ale války o rakouské dědictví v 18. století Frývaldov ekonomicky odřízly od okolních oblastí Slezska.

Sanace historického jádra města v období po druhé světové válce proběhla bez účasti archeologů, i později byly záchranné archeologické výzkumy ve městě realizovány pouze sporadicky (*Goš 1977*, *1978*, *1981*; *Brachtl – Dohnal 1992*; *Vrána 2005*). Záchranný archeologický výzkum realizovaný v roce 2005 v souvislosti s výstavbou „Multifunkčního centra pro cestovní ruch a lázeňství" se proto zdál dobrou příležitostí k získání poznatků o historii města, přestože proběhl v časové i finanční tísni toliko formou 30 zjišťovacích sond. Lokalita zabírá prostor zřejmě dvou novověkých městských parcel v těsné blízkosti Masarykova náměstí (*obr. 1, 2*), které bylo již od středověku hlavním tržištěm někdejšího Frývaldova; historie zdejší zástavby by proto měla být již od počátku úzce spjata s urbanistickým vývojem města Frývaldov.

Nejstarší sídelní horizont datovaný do období 14. století představují pozůstatky dvou zahloubených suterénů dřevohliněných domů (*obr. 3*) a související středověká souvrství. Druhý výrazný stavební a sídelní horizont na předmětné ploše spadá již do období 17. – 18. století, kam lze datovat výstavbu kamenného domu I, jehož pozůstatky se podařilo odkrýt (*obr. 3*). Nadzemní část parcelní zástavby byla bohužel zbourána již v sedmdesátých letech 20. století bez stavebněhistorické dokumentace.

Suterén domu I byl orientován podélnou osou kolmo na ulici Palackého, ke které se přimykal jižní čelní stěnou. Byl celkem cca 17,6 m dlouhý a 5,1 m široký a členil se na tři části. Jižní část A byla dlouhá cca 3 m, úroveň podlahy jsme v této části nezjistili, výšku sklepa lze hypoteticky odhadnout na 1,8 m. V jižní stěně domu se dochoval šikmý bankál suterénního okénka (*obr. 4, 5*). Jižní část A suterénu byla od střední části C oddělena dvěma pilíři spojenými destruovaným

klenebním pasem, překlenujícím 0,9 m široký vchod. Dveře se podle nálezu železného závěsu pantu otvíraly dovnitř doprava. Střední část C (2,6 m x 1,5 m), představovala komunikační prostor zajišťující spojení jižní i severní suterénní části se schodištěm. Byla vysoká více než 1,64 m a zřejmě zaklenutá. Do severní části B se vstupovalo 2,5 m širokým vchodem, rovněž překlenutým klenebním pasem. Dveře se opět otvíraly dovnitř doprava. Délka severní části B činila cca 9 m, šířka cca 3,6 m a výška cca 1,7 m (*obr. 6, 7*). V severní zdi byl zachycen stupňovitý bankál větracího okénka (0,75 m x 0,3 m x 0,35 m). Do střední části C vyúsťovalo schodiště D, vedoucí z prostoru dvorku usedlosti. V severní obvodové zdi prostoru schodiště se podařilo identifikovat odkládací niku na světlo (*obr. 8, 9*). Do schodiště se vstupovalo ze dvora, který se rozprostíral západně od domu.

Prostor východně od domu patřil v raném novověku k parcele, která zčásti zasahovala pod dnešní dům v sousedství. Parcelní hranice s největší pravděpodobností probíhala v linii východní obvodové zdi odkrytého domu I. Podařilo se odkrýt ještě část domu II, který na ní stál. Jeho reliktem je zeď 918 v sondě S18 a zeď 919 v sondě S11, přičemž se jedná o dvě rozdílné stavební fáze domu, v tomto případě vybaveného plochým stropem, jehož rozměry však nejsme schopni přesněji určit.

Do souvislosti s výše popsanými kamennými suterény domů lze pravděpodobně klást také nález dvou jam na skladování vápna, datovaných na základě stratigrafie a nečetných hmotných nálezů taktéž do průběhu 17. – 18. století. Soudobou sídelní aktivitu na lokalitě dokládá rovněž cca 0,3 – 0,5 m mocný horizont vrstev.

Shrneme-li, výzkum odkryl plochu zhruba jedné celé a jedné poloviny raně novověké parcely, jejichž šířku a délku prozatím nedokážeme přesněji určit. Na parcelách byly někdy ve 2. polovině 17. nebo na počátku 18. století postaveny kamenné suterény domů, podélnou osou orientované kolmo k ulici. Rozmístění dvou nalezených pozůstatků středověkých dřevohliněných suterénů nasvědčuje tomu, že se parcelace od středověku do staršího novověku výrazně nezměnila. Půdorys lépe zachovaného kamenného suterénu barokního domu je tříprostorový. Schodiště a střední část C sloužily ke vstupu do sklepení, dva nestejně veliké prostory A a B sloužily patrně již vlastnímu skladovacímu účelu. Různá velikost sklepů a jejich vchodů může indikovat buď jejich rozdílnou funkci, nebo dvě různé stavební fáze. Daleko složitější otázkou je vzhled nadzemní části domu – nelze vyloučit ani dřevěnou nadzemní stavbu. Výstavbu kamenného suterénu můžeme hypoteticky vztáhnout k období budování kamenných domů ve Frývaldově po sérii několika požárů v 17. století.

Výsledky archeologického výzkumu prokázaly, že přítomnost archeologa je v historickém jádru města nutná při každé stavební či výkopové akci. Rovněž se ukázalo, že při vhodně zvolené metodě výzkumu a za předpokladu nasazení týmu kvalifikovaných pracovníků lze i za velice nepříznivých podmínek získat velké množství informací, které pomohou objasnit historii osídlení nejen na předmětné lokalitě, nýbrž i doplnit naše informace o urbanistickém vývoji města Jeseník.

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Horní Víska, Tachov district, West Bohemia. Archaeological and geobotanical investigation of a deserted village

Horní Víska, okr. Tachov.
Archeologický a geobotanický výzkum zaniklé vsi

Horní Víska, Kr. Tachov, Westböhmen.
Die archäologische und geobotanische Untersuchung einer Dorfwüstung

Václav Matoušek – Petr Holý

Das Areal der Dorfwüstung Horní Víska wurde zum Versuchsbeispiel für die Kombination archäologischer, kartographischer und geobotanischer Methoden beim Studium der Entwicklung von aufgelassenen Kulturarealen. Die Gemeinde wurde 1954 verlassen, die meisten landwirtschaftlich genutzten Flächen wurden aufgeforstet. Der Raum der Dorfwüstung hat nahezu 50 Jahre danach einen Charakter, der dem frühen Stadium eines Schuttwaldes entspricht. Menschliches Wirken ist vor allem bei den Ergebnissen der gegenwärtigen Art der Forstwirtschaft sichtbar. Einige Gehölzarten und Gräser spiegeln nachweislich ältere Schichten menschlichen Wirkens wider. Die Ergebnisse des geobotanischen Studiums kommen erst in der Kombination mit archäologischen und kartographischen Quellen zum Tragen.

1. Subject and aims of the study

The subject of this project is the area of the deserted village of Horní Víska in West Bohemia. This area was documented in 1988-90 and 1999-2004 within the framework of systematic studies of the 1647 battlefield beneath Třebel Castle (described in detail in *Matoušek 2006*). During research into the battlefield, the greatest emphasis was placed on the combination of methods of non-destructive archaeological survey with those of historical cartography. At suitable locations, the results of the archaeological cartographic studies were complemented by methods drawn from other branches of the sciences.

The village of Horní Víska was abandoned in the 1950s, and in the years that followed its agricultural hinterland was for the most part converted into managed forestry. For this reason, the area of the deserted village appeared to be ideal for testing the potential of a combination of non-destructive archaeological, historical cartographic and geobotanical methods.

Fig. 1. Geographic delimitation of the study area. A – location of the study area in the Czech Republic; B – the study area.
Obr. 1. Geografické vymezení studované oblasti. A – poloha zájmového území v rámci ČR; B – zájmové území.

2. Geographic delimitation, natural conditions

The deserted village of Horní Víska is today part of the cadastre of the village of Stan, in the north-eastern part of Tachov district (*fig. 1*). Geomorphologically, the area of Horní Víska is part of the Teplá Uplands, and specifically the southern section thereof, the Bezdružice Uplands. The Teplá Uplands are themselves part of the extensive geological

region known as the Teplá Crystalline Complex, or rather the transitional zone from the Teplá-Barrandien region to the Teplá Crystalline Complex. The altitude of the territory (500-590 m a. s. l.) reflects the heights of the downs. In the most northerly part of the study area is the granitoid intrusion of the Lestkov Massif, formed predominantly of biotic granodiorites to amphilobitic/bioti quartzy diorites. Various basalt rocks are also represented here (*Demek et al. 1965*; *Czudek 1972*).

Horní Víska lies in the biogeographical province of "Central European Deciduous Woodland", the "Hercynian" sub-provinice and the transitional zone of the Plzeň bioregion (*Culek 1995*). The Plzeň bioregion comprises downlands on predominantly acidic shales and extremely acidic Permian sediments. This is reflected in the highly monotonous flora and fauna, depleted of most xerophilic species and species difficult to support. The area lies in a mesophytic, in a supracolline vegetation band, i.e. this is an area of typical sub-montane vegetation for a mild climate. The climax vegetation is forest, primary non-forest being extremely rare. The potential vegetation comprises acidophilic beech woods, i.e. beech growth bound to a more acidic substrate – *Luzulo-Fagetum* (*Culek 1995*). The primary watercourse in the Horní Víska area is the Kořenský stream, the deep valley of which also delimits the area to the west. The actual Horní Víska area is drained by a nameless brook that runs into the left bank of the Kořenský stream. The soils here are moderately earthy, with a base that is not particularly deep. Their granularity varies from earthy-sand to clayey-earth, with sandy earth predominating.

The study area is extremely broken, and at the same time very stony, and tips conspicuously to the south. The dominant morphological feature of the northern sections is Kamenný vrch (lit. ‚Stony Hill'; 608 m a. s. l), the surface of which is indeed covered by a contiguous layer of granite boulders. The surface of the neighbouring, only slightly lower, hill to the east (604 m a. s. l.) – divided from Kamenný vrch by a shallow saddle – is somewhat less stony. By contrast, a large quantity of granite boulders cover the hill neighbouring Kamenný vrch to the south-west (589 m a. s. l.) and the more southerly Dlouhý vrch (lit. ‚Long Hill'; 579 m a. s. l.). To the north-west the Víska region is closed off by a large rise (607 m a. s. l.), which is however even on the outside a granite outcrop – its surface is therefore virtually bare of large stones. The slopes above the confluence of the Kořenský stream and its aforementioned left-bank tributary are also very stony, with the appearance of the schistous substrate on the surface.

3. An outline of historical developments[1)]

Note 1:
The historical overview was limited only to data available from the historical and local historical literature, and to testimony from local residents.

A mere 400 m south-east of abandoned Horní Víska lies the still extant village of Dolní Víska (*fig. 2*). In the written record, Viska – with no differentiation of Horní (Upper) and Dolní (Lower) – is first mentioned for the year 1390, while in 1572 the form Vísky is given (*Profous & Svoboda 1957*, 554). On Müller's map and the Josephine mapping the two settlements appear under the common name Steinerndörfles (with the Josephine being more precise and distinguishing Ober- and Unterdörfles).

The striking proximity of the settlements suggests that they may share a genetic link, e.g. of the manor/village or feudal court/village type (cf. *Chotěbor 1982* or *Chotěbor – Smetánka 1985*). Without more detailed archival, structural historical and archaeological research at hand, however, this remains at the level of unconfirmed hypothesis. It is however worth mentioning that at the Třebel battlefield, some 7 km south-west of Víska, there is a comparable place-name

pair: Vysoké (High) and Dolní (Lower) Sedliště. Sedliště is first mentioned in 1358. At this site, too, a feudal court/village relationship is suggested.

An indicative sketch of the stable cadastre dating to 1839 shows the two villages marked at the centre of a joint cadastre. In the Imperial copy of the stable cadastre, also from 1839, they are however divided, in that Horní Víska is attached to the cadastral district of Stan while Dolní Víska retains its own separate cadastre. The Imperial reprint of the stable cadastre of Stan, however, still shows the original boundary of a separate cadastre of Horní Víska. Also worthy of note is the annotation to the Imperial copy, which draws attention to the new numbering of plots in Horní Víska in 1842. It is likely that the settlement agglomeration of Víska, created in the Middle Ages in the exceptionally inauspicious conditions of a markedly broken and stony terrain, was by the 19th century so economically weak and insignificant that from an administrative and economic point of view it was appropriate to remove its autonomy. The reasons for the medieval foundation of the Víska agglomeration evidently lost their importance in the development that followed. The development of the agglomeration is an instructive example of the fact that the structure of the medieval and modern agglomerations in the study area changed significantly.

Fig. 2. The local administrative situation in the study area. Red – current cadastral boundary; purple – former cadastral boundary.
Obr. 2. Územně-správní situace studované oblasti. Červená – hranice současných katastrů; fialová – bývalé hranice katastrů.

The transformation of administrative conditions is immediately apparent from a consideration of the shapes of the cadastral districts of Stan and Dolní Víska. It is evident that the area of Horní Víska forms a kind of appendage to the original extent of the Stan cadastre. On a map of the Dolní Víska cadastre, on the other hand, the "negative" of the detached Horní Víska area is clear.

After the expulsion of the German population, the village of Horní Víska was settled in 1946 by Slovak immigrants from Jedľové Kostolany near Zlaté Moravce. The Slovak families soon departed from the village, however. It was definitively abandoned in 1954, since which time settlement has never been renewed. In the 1960s-1980s the abandoned village was used for short-term military exercises – for several weeks at a time, the ruins played host to three or four vehicles (allegedly trucks towing rocket launchers). On such occasions, a base camp (field kitchen) would always be established at Dolní Víska. It was in connection with this military use that a wooden, single-storey structure was erected at the north-western edge of the abandoned village, which even after 1989 was briefly used (for around a year) by a children's home in Černošín. Today, only the building's concrete foundations remain. (Thanks are due to M. Válová of Olbramov and K. Vaněk of Kořen for this verbal information). Of the original village buildings all that remains are fragments of walls; the entire area is now densely overgrown. In the south-western area, a drained pond is apparent.

4. Fieldwork: methods and results

4.1 Delimitation of the study area

The area of the abandoned village of Horní Víska and its environs, with associated meadow and forest growth, were selected for the research project. The study area covers a total of 67.8 hectares. It runs from the abandoned village north-west to the Kořenský stream, while to the north and south it is

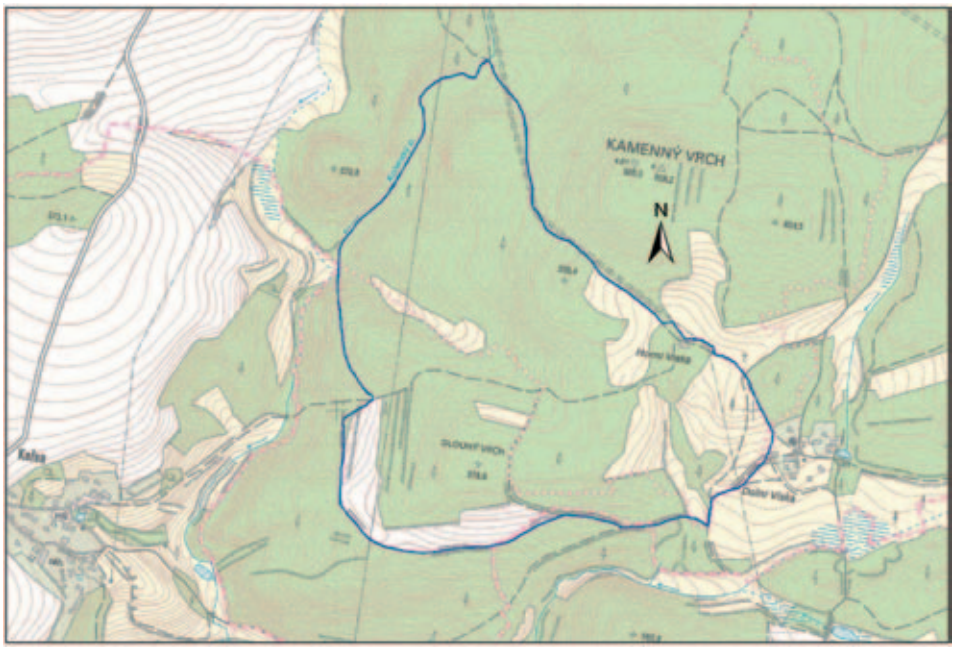

Fig. 3. Delimitation of the study space (blue line) and morphological conditions.
Obr. 3. Vymezení studovaného prostoru (modrá linka) a morfologické poměry.

delimited by tracks running to the villages of Stan and Kořen (*fig. 3*). In general, the boundaries of the area selected were semi-natural (tracks leading from Dolní Víska to Stan and Kořen) or natural (Kořenský stream to the north-west), clearly dividing different biotope areas (see below). Occasionally the boundaries had to be selected entirely artificially, e. g. part of the western boundary of the study area runs through forest growth. The borders chosen respect the capabilities of aerial photography, which was a key component of this study.

4.2 Methods and results of non-destructive archaeological investigation

Applying the methods for locating and documenting lost medieval field systems (*Černý 1973*; *1979*; *1993*), a rich complex of relics of former agricultural activity was identified and documented in the forests around Víska (*fig. 4*). This comprised above all terrace-like spaces and the small walls, up to 100 cm high and made from local granite boulders, that originally denoted the irregular boundaries of former fields, meadows and pastures (the archaeological field documentation was complemented in 2004 by precise geodetic measurements, and projected onto the modern cadastral map and aerial photographs – *Kovandová 2004*); there were in addition sizeable piles of large stones or regularly spaced, large rectangular "fields" of boulders at the edges of the agricultural plots. Unused paths, gradually becoming overgrown, are still clearly visible. The extent and course of the lost standing structures agrees with the structure of the agricultural land at the beginning of the stable cadastre.

A remnant of the lost symbolic level of the landscape is to be found in the complex of minor sacral features – stone and iron crosses on stone plints, or parts thereof. An unusual feature providing eloquent evidence of the changes in how the study are was viewed is an approximately 250 cm high wooden sculpture in the form of a column some 15 cm in diameter, into the upper part of which a stylised human face has been carved. This "totem" was apparently made in 1994 by a young man undertaking alternative national service in nearby Olbramov. What is fundamental here is that this romantic sculpture, in a remote, "barren", forested spot, stands in the middle of a former field, still tilled as late as during the 1940s.

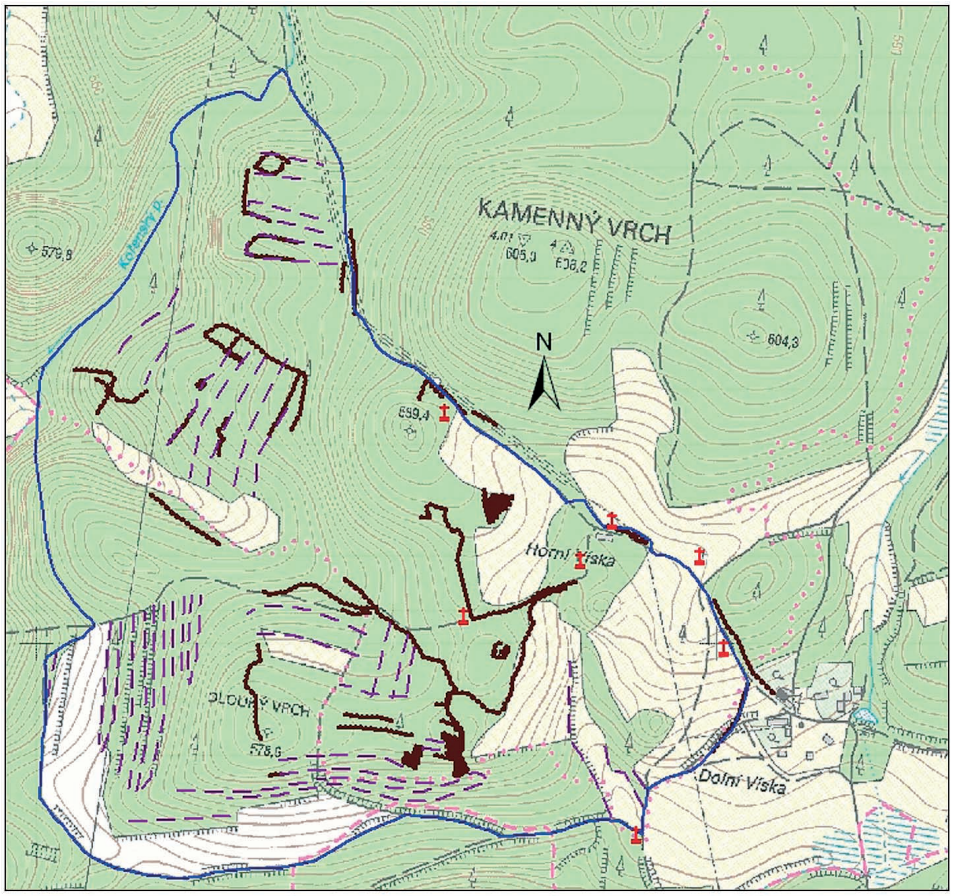

Fig. 4. Relicts of previous anthropogenic activity. Red cross – wayside shrine; purple dashed line – steps in the terrain; dark purple solid line – low stone walls; blue line – boundary of the study area.
Obr. 4. Relikty zaniklých antropogenních aktivit. Červený křížek – boží muka; fialová přerušovaná čára – terénní schody; tmavě fialová plná čára – kamenné zídky; modrá čára – hranice zkoumaného území.

4.3 Methods and results of geobotanical study

4.3.1 Investigative method

The vegetation in the study area was mapped using the biotope mapping method employed in preparing the Natura 2000 complex of March 2002. The Natura 2000 complex is a mosaic of protected areas of European significance, realised on the basis of European Community directives, by means of which unique and important natural biotopes, and the floral and faunal species within them, are to be conserved (*Guth 2002*). The targets of the mapping were the individual, accessible biotopes, through the mapping of all of the floral species, which were then tabulated (see *tabs. 1*, *2*). According to the catalogue of biotopes in the Czech Republic (*Chytrý – Kučera – Kočí 2001*), and on the basis of the presence, representative nature and state of preservation of floral species, individual areas were thus classed as given types of biotope. These characteristic, individual biotopes were then projected onto topographic maps using ArcView GIS 3.1 (*fig. 5*).

During monitoring, the study area was divided on the basis of community characteristics into 29 areas, with classification into 11 biotope types according to the catalogue of biotopes (see *tab. 1*).

4.3.2 Conclusions

The results of the geobotanical studies are summarised in table 1. Several basic observations follow from these results:

1. Almost 50 years after its desertion, the area of the abandoned village of Horní Víska is most reminiscent of the early stages of relict woodland (*fig. 6*).

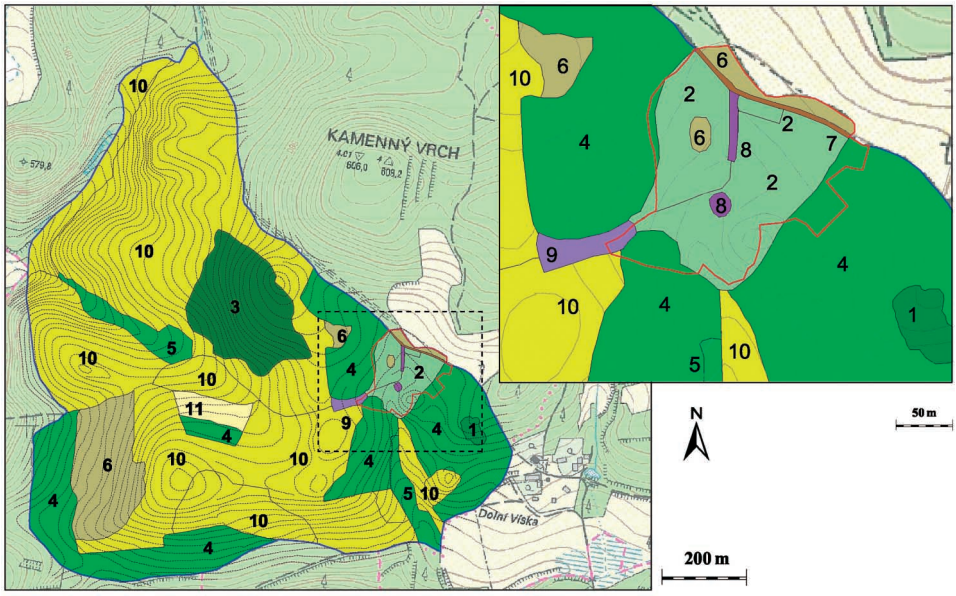

Fig. 5. Biotopes in and around the abandoned village of Horní Víska. Red line – boundary of the deserted settlement; blue line – boundary of the study area; 1 (K3) – tall mesic and xeric scrub; 2 (L4) – ravine forests; 3 (L8.1) – boreo-continental pine forests; 4 (T1.1) – mesic Arrhenatherum meadows; 5 (T1.5) – wet Cirsium meadows; 6 (X12) – stands of early successional woody species; 7 (X6) – anthropogenic areas with sporadic vegetation outside human settlements; 8 (X7) – herbaceous ruderal vegetation outside human settlements; 9 (X8) – scrub with ruderal or alien species; 10 (X9A) – forest plantations of allochtonous coniferous trees; 11 (X9B) – forest plantations of allochtonous deciduous trees.
Obr. 5. Biotopy v zaniklé obci Horní Víska a v jejím okolí. Červená linka – hranice zaniklé obce; modrá linka – hranice studované plochy; 1 (K3) – vysoké mezofilní a xerofilní dřeviny; 2 (L4) – suťové lesy; 3 (L8.1) – boreokontinentální bory; 4 (T1.1) – mezofilní ovsíkové louky; 5 (T1.5) – vlhké pcháčové louky; 6 (X12) – nálety pionýrských dřevin; 7 (X6) – antropogenní plochy se sporadickou vegetací mimo sídla; 8 (X7) – ruderální bylinná vegetace mimo sídla; 9 (X8) – křoviny s ruderálními a nepůvodními druhy; 10 (X9A) – lesní kultury s nepůvodními jehličnatými dřevinami; 11 (X9B) – lesní kultury s nepůvodními listnatými dřevinami.

2. The results of the systematic afforestation of the formerly agricultural area have been influenced by the natural environmental conditions. In the damper areas of the former meadows along the Kořenský stream spruces have been planted, while the stony slopes are by contrast dominated by pines (cf. in table 1 biotopes nos. 28, 29; *fig. 7*).
3. It is most likely that direct relicts of former human activity are to be seen in the appearance here of day lilies (identified within the area of the abandoned village) and a particular variety of red foxglove (observed in the adjacent woods). In both cases these are cultivated forms that do not appear naturally within the Czech Republic. They can, therefore, be taken as botanical indicators of former gardens (These are occurrences of pelorism, with the creation of rayed flowers instead of symmetrical flowers – *fig. 8*).
4. It is highly likely that other relicts of past activity can be seen in plants which, while already adapted to natural conditions here, appear in contexts where

Fig. 6. Wall fragment from one of the houses in Horní Víska. Thanks to the ruination here, growths of the advancing relict woodland are appearing here.
Obr. 6. Torzo zdi jednoho z domů Horní Vísky. Díky rozvalinám zde vzniká porost blížící se suťovému lesu.

Fig. 7. Rocky slope with dominant pines. – ***Obr. 7.*** Balvanitý svah s dominující borovicí.

Fig. 8. Cultivated variety of red foxglove. – ***Obr. 8***. Vyšlechtěná varieta náprsníku červeného.

archaeological sources supported by written records indicate that their occurrence in the study area is not merely by chance. This group includes common periwinkle (myrtle), orange lily, late/giant goldenrod and Good King Henry. The same character may be applied to the barley on the former path west of the village (*figs. 9, 10*).

Fig. 9. Periwinkle (myrtle) growth. – ***Obr. 9.*** Porost brčálu menšího (barvínku).

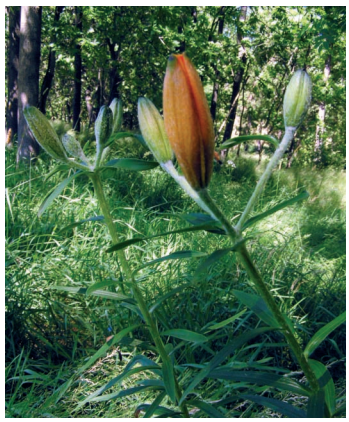

Fig. 10. Orange lily.
Obr. 10. Lilie cibulkonosná.

5. A specific set of botanical information came from the discovery of lupine. This plant is sewn in forests by hunters as dietary supplement for game (*fig. 11*).
6. The most conspicuous evidence for the recent present of man came from a number of woody plants – horse chestnut, locust tree, and fruit trees (*fig. 12*). This group must also include the hazels that still form clear rows along the old

Fig. 11. Lupine, planted by hunters as a dietary supplement for game. – *Obr. 11.* Vlčí bob mnoholistý, vysazovaný myslivci jako doplňkové krmivo pro zvěř.

cart tracks. Trees associated with human activity can also be found in the forest; previously, there were fields here with holding covers. As regards the appearance here of acacia, it is necessary to add that this is an imported species that grows particularly in warm localities. In its immediate environment, however, the acacia heavily restricts the growth of other vegetative types, which will have a negative influence on the value of botanical studies.

Fig. 12. A stand of fruit trees at the edge of the abandoned village. *Obr. 12.* Skupina ovocných stromů na okraji zaniklé vsi.

5. Discussion

The study of part of the area of the abandoned village of Horní Víska was based above all on the combination of surface archaeological investigation and the study of cartographic sources on the one hand, and geobotanical study on the other. Using a combination of archaeological and cartographic information, complemented sporadically by historical information, the abandoned settlement can easily be identified, along at the very least with a considerable part of the adjacent hinterland of the former village. In the studied landscape transect the aforementioned methods can be used to observe evidence for diverse processes – primarily the decline of settlement activity and the fundamental, qualitative transformation of the economic use of the area, characterised by the transition from predominantly agricultural use to forestry. Associated with this major change there are other, minor changes, e. g. the reduction or lessening of the density of the communications network; at a number of locations, the development sequence observable after the Second World War is field-meadow-abandoned meadow, subject to natural succession. Along with the decreasing intensity of human influence, and general social, cultural and political changes, comes a conspicuous decline in the symbolic level of the landscape, mediated through small Christian sacred features.

The geobotanical research draws attention to the fact the development of the vegetation cover is primarily conditioned by local environmental factors (the geological substrate, soil quality, hydrological conditions, the exposure of particular locations or intensity of direct sunlight). Human influence is demonstrable mainly in the results of the actual means of management (forestry and agricultural management, perhaps management for hunting – the sewing of lupine). Earlier layers of human action are clearly reflected in a number of woods (horse chestnut, locust tree, fruit trees and perhaps hazels) and plants (day lily, a cultivar of red foxglove). For other species of woody plants (hazels) and plants (periwinkle/myrtle, orange lily, late/giant goldenrod, Good King Henry) human influence in very likely, given the close relationship to archaeological relicts (the area of the abandoned village, associations with field and forest paths).

The combination of archaeological, cartographic, historic and geobotanical sources has made a significant contribution to the creation of a complex, historico-anthropological picture of landscape development. The specific example of the study of the area of the Horní/Dolní Víska agglomeration shows, however, that the contributions of these disciplines to understanding landscape development rely on their being used in combination; the value of studies employing the methods separately is considerably lower. In the case of the geobotanical methods in particular it is necessary to agree that within the context of historical studies, these are otherwise merely complementary (cf. *Kuna 2004*, 297n).

Resumé:

Areál zaniklé obce Horní Vísky byl zkoumán v rámci systematického studia prostoru bojiště u Třebele (1647). Lokalita se nachází v západních Čechách, v severovýchodní části tachovského okresu, přibližně 4 km severozápadně od městečka Černošín. Ves byla založena ve značně členitém terénu (540 – 600 m n. m.), jehož geologické podloží tvoří výběžek Lestkovského žulového masivu. Povrch zkoumaného areálu je zvláště v severní části pokryt souvislou vrstvou žulových balvanů.

Pouhých 400 m jihovýchodně od zaniklé Horní Vísky se nachází dosud existující Dolní Víska. V písemných pramenech je Víska (bez rozlišení, zda Horní či Dolní) uvedena poprvé k roku 1390. Po odsunu německého obyvatelstva byla obec od roku 1946 krátce osídlena slovenskými přistěhovalci. Pokus o osídlení však nebyl úspěšný a poslední obyvatelé opustili Horní Vísku v roce 1954. V šedesátých až osmdesátých letech 20. století byl prostor zaniklé obce využíván ke krátkodobým vojenským cvičením. Opuštěné vojenské objekty sloužily po roce 1989 krátce (cca 1 rok) jako klubovna dětského oddílu z nedalekého Černošína. Od té doby není prostor zaniklé obce využíván k žádným společenským účelům. Podstatná část původních zemědělských pozemků byla postupně zalesněna.

V areálu Horní Vísky byl nejprve proveden systematický nedestruktivní archeologický průzkum (2001) zaměřený na vyhledání a dokumentaci reliktů zaniklých lidských aktivit, zvláště pozůstatků zemědělských činností. Jednalo se především o terasovité úpravy svažitých terénů bývalých polí, dále o zídky ze žulových balvanů vymezující pole, louky a pastviny a v menší míře o dokumentaci krátkých úseků zaniklých polních a lesních cest. Zjištěné soustavy zalesněných zemědělských pozemků plně odpovídají rozsahu a struktuře zemědělských pozemků dokumentovaných na mapě stabilního katastru z roku 1839 i struktuře zachycené na nejstarším leteckém snímku z roku 1938. Archeologická dokumentace byla v roce 2003 upřesněna podrobným geodetickým zaměřením.

V roce 2003 byl areál Horní Vísky vybrán jako modelové území pro testování kombinace archeologických, kartografických a geobotanických metod studia vývoje zaniklých kulturních areálů. Pro výběr svědčil souběh ojedinělých kulturně historických a přírodních podmínek. Máme k dispozici relativně přesné a podrobné údaje o zániku obce a o jejích dalších osudech. Zároveň se areál nachází ve zcela mimořádných přírodních podmínkách. Mimořádně členitý a kamenitý reliéf krajiny vyžadoval v minulosti množství kulturních zásahů, které velmi výrazně a dlouhodobě poznamenaly charakter krajiny.

Vegetace zkoumaného území byla zmapována metodou mapování biotopů pro přípravu soustavy Natura 2000 z března roku 2002. Soustava Natura 2000 představuje mozaiku chráněných území evropského významu, realizovanou na základě směrnic Evropského společenství, prostřednictvím nichž se chrání jedinečné a důležité přírodní biotopy a v nich žijící rostlinné a živočišné druhy (*Guth 2002*). Objektem mapování byly jednotlivé zastoupené biotopy, prostřednictvím všech rostlinných druhů, vypisovaných do tabulky (viz *tab. 1*). Podle katalogu biotopů České republiky (*Chytrý – Kučera – Kočí 2001*) a přítomnosti rostlinných druhů, jejich reprezentativnosti a zachovalosti byly pak jednotlivé plochy přiřazeny k danému typu biotopu. Tyto charakteristiky jednotlivých biotopů jsme pomocí programu ArcView GIS 3.1 přenesli do topografické mapy.

Zkoumané území bylo při monitoringu dle charakteru společenstev rozděleno na 29 ploch, se zařazením do 11 druhů biotopů podle katalogu biotopů (viz *tab. 1*).

Výsledky geobotanického studia jsou shrnuty v tabulce na konci textu. Z výsledků vyplývá několik základních poznatků:

1. Prostor zaniklé vsi Horní Víska nabyl téměř 50 let po jejím zániku charakteru nejvíce podobnému ranému stadiu suťového lesa.
2. Výsledky systematického zalesňování původních zemědělských areálů jsou ovlivněny přirozenými přírodními podmínkami. Ve vlhčích polohách bývalých luk podél Kořenského potoka byly vysazeny porosty smrku, na kamenitých svazích naopak dominuje borovice (srv. např. *tab. 1* a *obr. 7)*.
3. Za přímé relikty zaniklých lidských aktivit lze s největší pravděpodobností považovat především výskyt lilie denní (zjištěn v areálu zaniklé vsi) a zvláštní variety náprstníku červeného (pozorován v přilehlých lesních porostech). V obou případech se jedná o vyšlechtěné formy, které se v naší přírodě volně nevyskytují. Lze je proto považovat za botanické indikátory zaniklých zahrad. (Jedná se o tzv. pelorii čili tvorbu paprsčitých květů místo souměrných.)
4. S velkou pravděpodobností lze za relikty zaniklých aktivit považovat i rostliny, které jsou sice již na naše přírodní poměry adaptované, ovšem kontext s archeologickými prameny podpořenými historickými zprávami naznačuje, že jejich výskyt není ve sledovaném prostoru náhodný. Do této skupiny řadíme výskyt brčálu menšího (barvínku), lilie cibulkonosné, zlatobýlu obrovského a merlíku všedobru. Stejný charakter lze přisoudit i ječmenu na zaniklé cestě západně od vsi.
5. Specifickou skupinu botanické informace představuje nález vlčího bobu. Tuto rostlinu vysazují do lesních porostů myslivci jako obohacení krmiva pro zvěř.
6. Nejvýraznějším dokladem nedávné přítomnosti člověka jsou některé dřeviny – jírovec maďal, trnovník akát a ovocné stromy. Do této skupiny můžeme zařadit i lísky, které vytváří stále zřetelná stromořadí u bývalých úvozových cest. Stromy související s lidskou aktivitou lze nalézt i v lese. Dříve se zde vyskytovala pole s remízky. K výskytu akátu je možné dodat, že se jedná o původně zavlečenou dřevinu, které se daří zvláště v teplejších lokalitách. Ve svém nejbližším okolí však akát silně omezuje výskyt dalších druhů vegetace, což negativně poznamenává vypovídací možnosti botanického studia.

Geobotanický výzkum modelového areálu Horní Vísky upozornil, že vývoj vegetačního pokryvu je primárně podmíněn lokálními přírodními podmínkami (geologickým podložím, kvalitou půdy, hydrologickými poměry, expozicí jednotlivých poloh, resp. intenzitou slunečního záření). Lidský impakt je prokazatelný především na výsledcích aktuálního způsobu hospodaření (lesní a zemědělské hospodářství, snad i hospodaření myslivecké – výsadba vlčího bobu). Starší vrstvy lidského působení prokazatelně odrážejí některé druhy dřevin (jírovec maďal, trnovník akát, ovocné stromy a snad lísky) a bylin (lilie denní, šlechtěná varieta náprstníku červeného). U dalších druhů dřevin (líska) a bylin (brčál menší – barvínek, lilie cibulkonosná, zlatobýl obrovský, merlík všedobr) je lidský impakt velmi pravděpodobný vzhledem k těsné návaznosti na archeologické relikty (areál zaniklého sídla, souvislost s lesními a polními komunikacemi).

Kombinace pramenů archeologických, kartografických, historických a geobotanických významně přispívá k tvorbě komplexního historicko-antropologického obrazu vývoje krajiny. Konkrétní příklad studia části areálu aglomerace Horní a Dolní Vísky však upozorňuje, že přínos jmenovaných disciplín k poznání vývoje krajiny spočívá v jejich vzájemné kombinaci. Vypovídací hodnota jednotlivých metod studia samostatně je podstatně nižší.

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Tab. 1. Detailed inventory of plant species – ***Tab. 1.*** Podrobný výpis rostlinných druhů

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1	Village overgrown with trees Vesnice zarostlá stromy	L4	D	B	**E3, E2**: jasan ztepilý *(Fraxinus excelsior)*, **jírovec maďal (*Aesculus hippocastanum*)**, líska obecná (*Corylus avellana*), vrba jíva (*Salix caprea*), bez černý (*Sambucus nigra*), jilm vaz (*Ulmus Laevis*), srstka obecná (*Ribes uva-crispa*), maliník obecný (*Rubus idaeus*), ostružiník křovitý (*Rubus fruticosus*), **šeřík obecný (*Syringa vulgaris*)**; **E1:** lipnice hajní (*Poa nemoralis*),řebříček obecný (*Achillea millefolium*), **merlík všedobr (*Chenopodium bonus-henricus*)**, svízel přítula (*Galium aparine*), kuklík městský (*Geum urbanum*), kopřiva dvoudomá (*Urtica dioica*), ovsík vyvýšený (*Arrhenatherum elatius*), kerblík lesní *(Anthriscus sylvestris)*, **vlčí bob mnoholistý (*Lupinus polyphyllus*)**, medyněk měkký (*Holcus mollis*), pomněnka rolní (*Myosotis arvensis*), kakost smrdutý (*Geranium robertianum*), pryskyřník prudký (*Ranunculus acer*), rozrazil rezekvítek (*Veronica chamaedrys*), jahodník obecný (*Fragaria vesca*), zvonek rozkladitý (*Campanula patula*), ostřice srstnatá (*Carex hirta*), srha laločnatá (*Dactylis glomerata*), kozinec sladkolistý (*Astragallus glycyphyllos*), **lilie cibulkonosná (*Lilium bulbiferum*)**, ptačinec trávovitý (*Stellaria graminea*), sítina rozkladitá (*Juncus effusus*), kontryhel obecný (*Alchemilla vulgaris*), **brčál menší (*Vinca minor*)**, vikev chlupatá (*Vicia hirsuta*), **denivka plavá (*Hemerocallis fulva*)**, ostřice měchýřkatá (*Carex vesicaria*), psárka luční (*Alopecurus pratensis*), metlice trsnatá (*Deschampsia cespitosa*), jetel plazivý (*Trifolium repens*);
2	Natural seeding of a young birch in the foundations of a demolished house Nálet mladých bříz v základech zbořeného domu	X12			bříza bělokorá (*Betula pendula*), lipnice hajní (*Poa nemoralis*);
3	Overgrown path on the green Zarostlá bývalá cesta na náves, 10 m.	X7			kopřiva dvoudomá (*Urtica dioica*), **brčál menší (*Vinca minor*)**, bršlice kozí noha (*Aegopodium podagraria*), kerblík lesní *(Anthriscus sylvestris)*, jitrocel větší (*Plantago major*), jetel plazivý (*Trifolium repens*), pcháč obecný (*Cirsium vulgare*), pryskyřník plazivý (*Ranunculus repens*), ptačinec žabinec (*Stellaria media*), lipnice hajní (*Poa nemoralis*), svízel přítula (*Galium aparine*), srha laločnatá (*Dactylis glomerata*), rozrazil rezekvítek (*Veronica chamaedrys*), ostřice srstnatá (*Carex hirta*), **máta huňatá (*Mentha x rotundifolia*)**, řebříček obecný (*Achillea millefolium*), popenec břečťanolistý (*Glechoma hederacea*), ptačinec trávovitý (*Stellaria graminea*), ovsík vyvýšený (*Arrhenatherum elatius*), konopice pýřitá (*Galeopsis pubescens*), **vlčí bob mnoholistý (*Lupinus polyphyllus*)**, bojínek luční (*Phleum pratense*), jílek vytrvalý (*Lolium perenne*);
4	Former houses, now overgrown Zarostlé bývalé domy	L4	C	B	**E3, E2:** buk lesní (*Fagus sylvatica*), jilm horský (*Ulmus glabra*), jasan ztepilý (*Fraxinus excelsior*), **ořešák královský (*Juglans regia*), třešeň (*Prunus sp*)**, maliník obecný (*Rubus idaeus*), bez černý (*Sambucus nigra*), srstka obecná (*Ribes uva-crispa*); **E1:** kuklík městský (*Geum urbanum*), kakost smrdutý (*Geranium robertianum*), kerblík lesní *(Anthriscus sylvestris)*, lipnice hajní (*Poa nemoralis*), rozrazil rezekvítek (*Veronica chamaedrys*), **brčál menší (*Vinca minor*);**
5	Overgrown grassy area, north-west of the road, lower stand density Zarostlá travnatá plocha, na SZ od cesty, řidší zakmenění	K3	D	B	**E3, E2:** jasan ztepilý (*Fraxinus excelsior*), líska obecná (*Corylus avellana*),, jilm horský (*Ulmus glabra*), vrba jíva (*Salix caprea*), bez černý (*Sambucus nigra*), srstka obecná (*Ribes uva-crispa*), růže šípková (*Rosa canina*), **hloh jednosemenný (*Crataegus monogyna*)**, smrk ztepilý (*Picea abies*); **E1:** lipnice hajní (*Poa nemoralis*), vikev chlupatá (*Vicia hirsuta*), pryskyřník prudký (*Ranunculus acer*), **merlík všedobr (*Chenopodium bonus-henricus*),** jahodník obecný (*Fragaria vesca*), kakost smrdutý (*Geranium robertianum*), kerblík lesní *(Anthriscus sylvestris)*, česnáček lékařský (*Alliaria petiolata*), kopřiva dvoudomá (*Urtica dioica*);
6	Village road – in use Cesta vesnicí - používaná	X6			lipnice roční (*Poa annua*), rdesno ptačí (*Polygonum aviculare*), heřmánek terčovitý (*Matricaria matricaroides*), jitrocel větší (*Plantago major*), lipnice hajní (*Poa nemoralis*), pryskyřník plazivý (*Ranunculus repens*), kokoška pastuší tobolka (*Capsella bursa-pastoris*), smetanka (*Taraxacum ruderalis*);

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7	Part of the village, beyond the pond Část vesnice za rybníkem	L4	D	D	**E3, E2:** buk lesní (*Fagus sylvatica*), líska obecná (*Corylus avellana*), bříza bělokorá (*Betula pendula*), jasan ztepilý (*Fraxinus excelsior*), bez černý (*Sambucus nigra*), jilm horský (*Ulmus glabra*); **E1:** srha laločnatá (*Dactylis glomerata*), **brčál menší (*Vinca minor*)**, kopřiva dvoudomá (*Urtica dioica*), kerblík lesní (*Anthriscus sylvestris*), česnáček lékařský (*Alliaria petiolata*), netýkavka malokvětá (*Impatiens parviflora*), netýkavka nedůtklivá (*Impatiens noli-tangere*), šťovík tupolistý (*Rumex obtusifolius*), popenec břečťanolistý (*Glechoma hederacea*), lipnice hajní (*Poa nemoralis*), kakost smrdutý (*Geranium robertianum*), medyněk měkký (*Holcus mollis*), svízel přítula (*Galium aparine*);
8	Former pond Bývalý rybník, cca 15x10 m.	X7			kopřiva dvoudomá (*Urtica dioica*), česnáček lékařský (*Alliaria petiolata*), kerblík lesní (*Anthriscus sylvestris*), svízel přítula (*Galium aparine*), kakost smrdutý (*Geranium robertianum*), netýkavka malokvětá (*Impatiens parviflora*);
9	Meadow Louka	T1.1	B	B	lipnice luční (*Poa pratensis*), zvonek rozkladitý (*Campanula patula*), srha laločnatá (*Dactylis glomerata*), lnice květel (*Linaria vulgaris*), mochna stříbrná (*Potentilla argentea*), **vlčí bob mnoholistý (*Lupinus polyphyllus*)**, ovsík vyvýšený (*Arrhenatherum elatius*), smetanka (*Taraxacum ruderalis*), šťovík menší (*Rumex acetosella*), jetel plazivý (*Trifolium repens*), jetel ladní (*Trifolium campestre*), kopretina bílá (*Leucanthemum vulgare*), rožec rolní (*Cerastium arvense*), čičorka pestrá (*Coronilla varia*), hadinec obecný (*Echium vulgare*), kozí brada luční (*Tragopogon pratensis*), pryšec chvojka (*Euphorbia cyparissias*), svízel přítula (*Galium aparine*), chrastavec rolní (*Knautia arvensis*), štírovník růžkatý (*Lotus corniculatus*), řebříček obecný (*Achillea millefolium*), kozinec sladkolistý (*Astragalus glycyphyllos*), hrachor lesní (*Lathyrus sylvestris*), divizna velkokvětá (*Verbascum densiflorum*), vikev úzkolistá (*Vicia angustifolia*), ostružiník křovitý (*Rubus fruticosus*) – jeden malý;
10	Preserve Remízek	K3	B	B	**E2, E3:** líska obecná (*Corylus avellana*), bříza bělokorá (*Betula pendula*), zmlazuje jeřáb ptačí (*Sorbus aucuparia*), trnovník akát (*Robinia pseudoacacia*), trnka obecná (*Prunus spinosa*), borovice lesní (*Pinus sylvestris*); **E1:** místy bez pokryvu - jen listy lísky; lipnice hajní (*Poa nemoralis*), divizna velkokvětá (*Verbascum densiflorum*), jestřábník zední (*Hieracium murorum*), konvalinka vonná (*Convallaria majalis*), lipnice úzkolistá (*Poa angustifolia*), kakost smrdutý (*Geranium robertianum*), česnáček lékařský (*Alliaria petiolata*), svízel přítula (*Galium aparine*);
11	Section of forest, previously pasturage Výsek lesa, dříve se páslo	X9A			**E3, E2:** borovice lesní (*Pinus sylvestris*), líska obecná (*Corylus avellana*), topol osika (*Populus tremula*), růže šípková (*Rosa canina*), bez černý (*Sambucus nigra*), borůvka černá (*Vaccinium myrtillus*), krušina olšová (*Frangula alnus*), zmlazuje dub letní (*Quercus robur*) a jeřáb ptačí (*Sorbus aucuparia*); **E1:** ovsík vyvýšený (*Arrhenatherum elatius*), kakost smrdutý (*Geranium robertianum*), lipnice hajní (*Poa nemoralis*), jestřábník zední (*Hieracium murorum*), metlička křivolaká (*Avenella flexuosa*), medyněk měkký (*Holcus mollis*), šťovík menší (*Rumex acetosella*), kostřava ovčí (*Festuca ovina*), vrbka úzkolistá (*Chamaeneiron angustifolium*), konopice pýřitá (*Galeopsis pubescens*), starček Fuchsův (*Senecio ovatus*), starček lepkavý (*Senecio viscosus*);
12	Pine monoculture Borovicová monokultura	X9A			**E3, E2:** borovice lesní (*Pinus sylvestris*), **líska obecná (*Corylus avellana*);** **E1:** medyněk měkký (*Holcus mollis*), ovsík vyvýšený (*Arrhenatherum elatius*), kopřiva dvoudomá (*Urtica dioica*);
13	Moist meadow (thistle meadow) Vlhká louka (pcháčová louka)	T1.5	C	B	pcháč bahenní (*Cirsium palustre*), vrbina penízková (*Lysimachia nummularia*), psárka luční (*Alopecurus pratensis*), bršlice kozí noha (*Aegopodium podagraria*), kopřiva dvoudomá (*Urtica dioica*), ostřice srstnatá (*Carex hirta*), pomněnka rolní (*Myosotis arvensis*), kohoutek luční (*Lychnis flos-cuculi*), skřípina lesní (*Scirpus sylvaticus*), blatouch bahenní (*Caltha palustris*), přeslička bahenní (*Equisetum palustre*), na okrajích vrba bílá (*Salix alba*), **hloh jednosemenný (*Crataegus monogyna*), třešeň (*Prunus sp*) –** vždy jeden kus**;**

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14	Pine monoculture Borovicová monokultura	X9A			**E3, E2:** borovice lesní (*Pinus sylvestris*), na J okraji smrková monokultura (*Picea abies*) bez podrostu, javor mléč (*Acer platanoides*), modřín opadavý (*Larix decidua*), na okraji líska obecná (*Corylus avellana*) a bříza bělokorá (*Betula pendula*); **E1:** pšeníčko rozkladité (*Milium effusum*), vlaštovičník větší (*Chelidonium majus*), zvonek okrouhlolistý (*Campanula rotundifolia*), starček Fuchsův (*Senecio ovatus*), vesnovka obecná (*Cardaria draba*), vlčí bob mnoholistý (*Lupinus polyphyllus*), jestřábník zední (*Hieracium murorum*), věsenka nachová (*Prenanthes purpurea*);
15	Pine monoculture Borovicová monokultura	X9A			**E3, E2:** borovice lesní (*Pinus sylvestris*), modřín opadavý (*Larix decidua*), bříza bělokorá (*Betula pendula*), bez černý (*Sambucus nigra*), růže šípková (*Rosa canina*), na okraji u cesty líska obecná (*Corylus avellana*) a bříza bělokorá (*Betula pendula*) – bývalé stromořadí; **E1:** ovsík vyvýšený (*Arrhenatherum elatius*), medyněk měkký (*Holcus mollis*), lipnice hajní (*Poa nemoralis*), **náprstník červený (*Digitalis purpurea*)**, rozrazil lékařský (*Veronica officinalis*), kerblík lesní (*Anthriscus sylvestris*), metlička křivolaká (*Avenella flexuosa*), protěž lesní (*Gnaphalium sylvaticum*), smolnička obecná (*Viscaria vulgaris*) na okraji březového porostu, kostřava ovčí (*Festuca ovina*);
16	Meadow Louka	T1.1	B	B	vikev plotní (*Vicia sepium*), hadinec obecný (*Echium vulgare*), svízel povázka (*Galium mollugo*), třezalka tečkovaná (*Hypericum perforatum*), jestřábník chlupáček (*Hieracium pilosella*), řebříček obecný (*Achillea millefolium*), jitrocel kopinatý (*Plantago lanceolata*), ovsík vyvýšený (*Arrhenatherum elatius*), bojínek luční (*Phleum pratense*), válečka lesní (*Brachypodium sylvaticum*), kostřava ovčí (*Festuca ovina*), jetel ladní (*Trifolium campestre*);
17	Forest Les	X9A			**E3, E2:** borovice lesní (*Pinus sylvestris*), smrk ztepilý (*Picea abies*), bříza bělokorá (*Betula pendula*), krušina olšová (*Frangula alnus*), topol balzámový (*Populus x balsamifera*), **třešeň (*Prunus sp.*)**, rozložitý buk lesní (*Fagus sylvatica*), borůvka černá (*Vaccinium myrtillus*); **E1:** třeslice prostřední (*Briza media*), smolnička obecná (*Viscaria vulgaris*), metlička křivolaká (*Avenella flexuosa*), svízel přítula (*Galium aparine*), medyněk měkký (*Holcus mollis*), kakost smrdutý (*Geranium robertianum*), kopřiva dvoudomá (*Urtica dioica*), knotovka bílá (*Melandrium album*), česnáček lékařský (*Alliaria petiolata*), bažanka vytrvalá (*Mercurialis perennis*), pomněnka rolní (*Myosotis arvensis*), lipnice roční (*Poa annua*), jestřábník zední (*Hieracium murorum*), kopřiva dvoudomá (*Urtica dioica*) – pod třešněmi, starček obecný (*Senecio vulgaris*), tomka vonná (*Anthoxanthum odoratum*);
18	Birch grove on the stepped terraces that were previously small plots Březový háj na stupňovitých terasách, kde bývala dříve políčka	X12			**E3, E21:** bříza bělokorá (*Betula pendula*), pruh mladých smrků (*Picea abies*), jasan ztepilý (*Fraxinus excelsior*), borovice lesní (*Pinus sylvestris*), topol balzámový (*Populus x balsamifera*), janovec metlatý (*Sarothamnus scoparius*), borůvka černá (*Vaccinium myrtillus*); **E1:** lipnice hajní (*Poa nemoralis*), ovsík vyvýšený (*Arrhenatherum elatius*), zvonek okrouhlolistý (*Campanula rotundifolia*), rozrazil rezekvítek (*Veronica chamaedrys*), kopřiva dvoudomá (*Urtica dioica*), medyněk vlnatý (*Holcus lanatus*), svízel povázka (*Galium mollugo*), svízel lesní (*Galium silvaticum*), smolnička obecná (*Viscaria vulgaris*), starček Fuchsův (*Senecio ovatus*), řebříček obecný (*Achillea millefolium*), mochna nátržník (*Potentilla erecta*);
19	Forest meadow Louka v lese	T1.1	A	B	ovsík vyvýšený (*Arrhenatherum elatius*), medyněk měkký (*Holcus mollis*), srha laločnatá (*Dactylis glomerata*), pryskyřník prudký (*Ranunculus acer*), mochna husí (*Potentilla anserina*), psárka luční (*Alopecurus pratensis*), řebříček obecný (*Achillea millefolium*), jetel plazivý (*Trifolium repens*), pomněnka rolní (*Myosotis arvensis*), zvonek rozkladitý (*Campanula patula*), svízel povázka (*Galium mollugo*), svlačec rolní (*Convolvulus arvensis*), bedrník větší (*Pimpinella major*), kozinec sladkolistý (*Astragallus glycyphyllos*), ostřice třeslicovitá (*Carex brizoides*), štírovník růžkatý (*Lotus corniculatus*), jitrocel kopinatý (*Plantago lanceolata*), ostřice nízká (*Carex humilis*), kopretina bílá (*Leucanthemum vulgare*), lnice květel (*Linaria vulgaris*), tomka vonná (*Anthoxanthum odoratum*), ptačinec trávovitý (*Stellaria graminea*), řeřišnice luční (*Cardamine pratensis*), (lipnice luční *Poa pratensis*), kostřava červená (*Festuca rubra*), vikev úzkolistá (*Vicia angustifolia*);
20	Linden monoculture Lipová monokultura	X9B			lípa (*Tilia sp.*) - pruh, široký 40 metrů;

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21	Meadow by the village, near the road Louka u vsi podél cesty	T1.1	B	B	lipnice úzkolistá (*Poa angustifolia*), bojínek luční (*Phleum pratense*), srha laločnatá (*Dactylis glomerata*), ovsík vyvýšený (*Arrhenatherum elatius*), zvonek rozkladitý (*Campanula patula*), rozrazil rezekvítek (*Veronica chamaedrys*), jetel plazivý (*Trifolium repens*), řebříček obecný (*Achillea millefolium*), smetanka (*Taraxacum ruderalis*), jitrocel větší (*Plantago major*), hrachor lesní (*Lathyrus sylvestris*), kerblík lesní *(Anthriscus sylvestris)*, pryskyřník prudký (*Ranunculus acer*), sveřep měkký (*Bromus mollis*), kontryhel obecný (*Alchemilla vulgaris*), třezalka tečkovaná (*Hypericum perforatum*), svízel přítula (*Galium aparine*), kopretina bílá *(Leucanthemum vulgare)*, svlačec rolní (*Convolvulus arvensis*), vikev ptačí (*Vicia cracca*), mochna stříbrná (*Potentilla argentea*), jetel ladní (*Trifolium campestre*);
22	Semi-island of woodland with boulders Poloostrůvek lesa s balvany	K3	C	B	**E3, E2:** líska obecná (*Corylus avellana*), topol osika (*Populus tremula*), bříza bělokorá (*Betula pendula*), borůvka černá (*Vaccinium myrtillus*), zmlazuje topol balzámový (*Populus x balsamifera*), u velkých kamenů přechod do monokultury borovice lesní (*Pinus sylvestris*); **E1:** medyněk měkký (*Holcus mollis*), česnáček lékařský (*Alliaria petiolata*), svízel přítula (*Galium aparine*), černýš luční *(Melampyrum pratense)*, kostřava ovčí (*Festuca ovina*), mochna nátržník (*Potentilla erecta*), kakost smrdutý (*Geranium robertianum*), kerblík lesní *(Anthriscus sylvestris)*;
23	Meadow immediately adjacent to the village, more ruderalised Louka těsně u vesnice, více ruderalizovaná	T1.1	C	B	lopuch menší (*Arctium minus*), kopřiva dvoudomá (*Urtica dioica*), lipnice úzkolistá (*Poa angustifolia*), ovsík vyvýšený (*Arrhenatherum elatius*), bojínek luční (*Phleum pratense*), **vlčí bob mnoholistý (*Lupinus polyphyllus*),** kerblík lesní *(Anthriscus sylvestris)*, trojštět žlutavý *(Trisetum flavescens)*, rozrazil rezekvítek (*Veronica chamaedrys*), štírovník růžkatý (*Lotus corniculatus*), kontryhel obecný (*Alchemilla vulgaris*), kostřava luční (*Festuca pratensis*), mochna stříbrná (*Potentilla argentea*), svlačec rolní *(Convolvulus arvensis)*, **ječmen (*Hordeum sp.*);**
24	Former road, now overgrown; 4 m wide line, a low stone wall on each side Bývalá cesta, dnes zarostlá; 4 m široká linie – z obou stran kamenná zídka	X8			**E3, E2:** trnovník akát (*Robinia pseudoacacia*), líska obecná (*Corylus avellana*), jasan ztepilý (*Fraxinus excelsior*), bříza bělokorá (*Betula pendula*); **E1:** kakost smrdutý *(Geranium robertianum)*, netýkavka malokvětá (*Impatiens parviflora*), **ječmen (*Hordeum sp.*),** merlík všedobr (*Chenopodium bonus-henricus*), psárka luční (*Alopecurus pratensis*), lipnice hajní (*Poa nemoralis*), svízel přítula (*Galium aparine*), vlaštovičník větší (*Chelidonium majus*), česnáček lékařský (*Alliaria petiolata*), kopřiva dvoudomá (*Urtica dioica*);
25	Moist forest meadow Vlhká louka v lese	T1.5	B	B	metlice trsnatá (*Deschampsia cespitosa*), kohoutek luční (*Lychnis flos-cuculi*), psárka luční (*Alopecurus pratensis*), medyněk vlnatý (*Holcus lanatus*), pcháč bahenní (*Cirsium palustre*), **vlčí bob mnoholistý (*Lupinus polyphyllus*)**, kopretina bílá *(Leucanthemum vulgare)*, svízel bahenní (*Galium palustre*), sítina rozkladitá (*Juncus effusus*), mochna nátržník (*Potentilla erecta*), skřípina lesní (*Scirpus sylvaticus*), štírovník růžkatý (*Lotus corniculatus*), pryskyřník prudký (*Ranunculus acer*), konopice pýřitá (*Galeopsis pubescens*); na okraji nálet smrku (*Picea abies*), soliterní borovice lesní (*Pinus sylvestris*);
26	Woodland – young spruce growth Les – mladá smrčina	X9A			**E3, E2:** smrk ztepilý (*Picea abies*), borovice lesní (*Pinus sylvestris*), bříza bělokorá (*Betula pendula*), topol balzámový (*Populus x balsamifera*); **E1:** třeslice prostřední (*Briza media*), smolnička obecná (*Viscaria vulgaris*), metlička křivolaká (*Avenella flexuosa*), svízel přítula (*Galium aparine*), kakost smrdutý (*Geranium robertianum*), kopřiva dvoudomá (*Urtica dioica*), knotovka bílá (*Melandrium album*), česnáček lékařský (*Alliaria petiolata),* pomněnka rolní (*Myosotis arvensis*), lipnice roční (*Poa annua*), jestřábník zední (*Hieracium murorum*);
27	Woodland – pinewood on slope with large stones Les – bor na svahu s velkými kameny	L8.1	D	C	**E3, E2:** borovice lesní (*Pinus sylvestris*), smrk ztepilý (*Picea abies*), líska obecná (*Corylus avellana*), jeřáb ptačí (*Sorbus aucuparia*), růže šípková (*Rosa canina*), bez černý (*Sambucus nigra*), borůvka černá (*Vaccinium myrtillus*), brusinka obecná *(Vaccinium vitis-idaea)*, krušina olšová (*Frangula alnus*); **E1:** ovsík vyvýšený (*Arrhenatherum elatius*), kakost smrdutý (*Geranium robertianum*), lipnice hajní (*Poa nemoralis*), jestřábník zední (*Hieracium murorum*), metlička křivolaká (*Avenella flexuosa*), medyněk měkký (*Holcus mollis*), šťovík menší (*Rumex acetosella*), kostřava ovčí (*Festuca ovina*), vrbka úzkolistá (*Chamaeneiron angustifolium*), konopice pýřitá (*Galeopsis pubescens*), starček Fuchsův (*Senecio ovatus*), starček lepkavý (*Senecio viscosus*);

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28	Forest Les	X9A			**E3, E2:** borovice lesní *(Pinus sylvestris)*, smrk ztepilý *(Picea abies)*, bříza bělokorá (*Betula pendula*), jasan ztepilý (*Fraxinus excelsior*), javor klen (*Acer pseudoplatanus*), trnovník akát (*Robinia pseudoacacia*); **E1:** třeslice prostřední (*Briza media*), metlička křivolaká (*Avenella flexuosa*), medyněk měkký (*Holcus mollis*), kakost smrdutý (*Geranium robertianum*), kopřiva dvoudomá (*Urtica dioica*), knotovka bílá (*Melandrium album*), česnáček lékařský (*Alliaria petiolata),* pomněnka rolní (*Myosotis arvensis*), jestřábník zední (*Hieracium murorum*);
29	Woodland by the stream Les u potoka	X9A			**E3, E2:** smrk ztepilý (*Picea abies*), borovice lesní (*Pinus sylvestris*), bříza bělokorá (*Betula pendula*), topol osika (*Populus tremula*), topol balzámový (*Populus x balsamifera*); **E1:** třeslice prostřední (*Briza media*), smolnička obecná (*Viscaria vulgaris*), metlička křivolaká (*Avenella flexuosa*), svízel přítula (*Galium aparine*), kakost smrdutý (*Geranium robertianum*), kopřiva dvoudomá (*Urtica dioica*), knotovka bílá (*Melandrium album*), česnáček lékařský (*Alliaria petiolata),* pomněnka rolní (*Myosotis arvensis*);

LEGEND:

Bold text: species documenting likely prior occupation by humans (synanthropic); underlined text: dominant (preponderant) species at the given location.

List of biotopes present:
K3 – highly mesophilic and xerophilic scrub;
L4 – relict woodland;
L8.1 – Boreo-Continental pinewoods;
T1.1 – mesophilic oatgrass meadows;
T1.5 – wet thistle meadows;
X12 – invasion of pioneer woody plants;
X6 – anthropogenic areas with sporadic vegetation outside settlement;
X7 – ruderal herbaceous vegetation outside settlement;
X8 – shrubbery with ruderal and non-indigenous species;
X9A – forest culture with non-indigenous pine woods;
X9B – forest culture with non-indigenous deciduous trees.

Representativeness:
A – growth in the segment fully accords with the description in the biotope catalogue;
B – less representative, or the growth shows a slight tendency towards other mapping units;
C – as B, but to a greater extent;
D – growth in the segment in not representative, in particular due to pronounced degradation.

State of preservation:
A – excellent from the point of view of nature conservation – in particular in the sense of natural stations;
B – good to satisfactory;
C – unsatisfactory (considerable human influence).

Vegetation stage:
E1 – herbal layer;
E2 – shrub layer;
E3 – tree layer.

VYSVĚTLIVKY:

Tučný text – druh dokazující pravděpodobný bývalý pobyt člověka (synantropní); podtržený text – druh na dané lokalitě dominantní (převažující).

Seznam vyskytujících se biotopů:
K3 – vysoké mezofilní a xerofilní křoviny;
L4 – suťové lesy;
L8.1 – boreokontinentální bory;
T1.1 – mezofilní ovsíkové louky;
T1.5 – vlhké pcháčové louky;
X12 – nálety pionýrských dřevin;
X6 – antropogenní plochy se sporadickou vegetací mimo sídla;
X7 – ruderální bylinná vegetace mimo sídla;
X8 – křoviny s ruderálními a nepůvodními druhy;
X9A – lesní kultury s nepůvodními jehličnatými dřevinami;
X9B – lesní kultury s nepůvodními listnatými dřevinami.

Reprezentativnost:
A – porost v segmentu plně odpovídá popisu v Katalogu biotopů;
B – reprezentativnost snížena, nebo porost vykazuje mírnou tendenci k jiné mapovací jednotce;
C – stejné jako hodnota B, ale ve větší míře;
D – porost v segmentu není reprezentativní zejména z důvodu silné degradace.

Zachovalost:
A – výborný stav z hlediska ochrany přírody - především ve smyslu přírodních stanovišť;
B – stav je dobrý až uspokojivý;
C – přírodní stav je nepříznivý (velký vliv člověka).

Vegetační etáže:
E1 – bylinné patro;
E2 – keřové patro;
E3 – stromové patro.

Tab. 2a. List of herbs identified in the study area. – ***Tab. 2a***. Seznam bylinných druhů zjištěných na studovaném území.

Czech name / český název	Latin name / latinský název	Czech name / český název	Latin name / latinský název
bažanka vytrvalá	(*Mercurialis perennis*)	ostřice měchýřkatá	(*Carex vesicaria*)
bedrník větší	(*Pimpinella major*)	ostřice nízká	(*Carex humilis*)
blatouch bahenní	(*Caltha palustris*)	ostřice srstnatá	(*Carex hirta*)
bojínek luční	(*Phleum pratense*)	ostřice třeslicovitá	(*Carex brizoides*)
brčál menší	(*Vinca minor*)	ovsík vyvýšený	(*Arrhenatherum elatius*)
bršlice kozí noha	(*Aegopodium podagraria*)	pcháč bahenní	(*Cirsium palustre*)
černýš luční	*(Melampyrum pratense)*	pcháč obecný	(*Cirsium vulgare*)
česnáček lékařský	(*Alliaria petiolata*)	pomněnka rolní	(*Myosotis arvensis*)
čičorka pestrá	(*Coronilla varia*)	popenec břečťanolistý	(*Glechoma hederacea*)
denivka plavá	*(Hemerocallis fulva)*	protěž lesní	(*Gnaphalium sylvaticum*)
divizna velkokvětá	(*Verbascum densiflorum*)	pryskyřník plazivý	(*Ranunculus repens*)
hadinec obecný	(*Echium vulgare*)	pryskyřník prudký	(*Ranunculus acer*)
heřmánek terčovitý	(*Matricaria matricaroides*)	pryšec chvojka	(*Euphorbia cyparissias*)
hrachor lesní	(*Lathyrus sylvestris*)	přeslička bahenní	(*Equisetum palustre*)
chrastavec rolní	(*Knautia arvensis*)	psárka luční	(*Alopecurus pratensis*)
ahodník obecný	(*Fragaria vesca*)	pšeníčko rozkladité	(*Milium effusum*)
janovec metlatý	(*Sarothamnus scoparius*)	ptačinec trávovitý	(*Stellaria graminea*)
ječmen	(*Hordeum sp.*)	ptačinec žabinec	(*Stellaria media*)
jestřábník chlupáček	(*Hieracium pilosella*)	rdesno ptačí	(*Polygonum aviculare*)
jestřábník zední	(*Hieracium murorum*)	rozrazil lékařský	(*Veronica officinalis*)
jetel ladní	(*Trifolium campestre*)	rozrazil rezekvítek	(*Veronica chamaedrys*)
jetel plazivý	(*Trifolium repens*)	rožec rolní	(*Cerastium arvense*)
jílek vytrvalý	(*Lolium perenne*)	řebříček obecný	(*Achillea millefolium*)
jitrocel kopinatý	(*Plantago lanceolata*)	řeřišnice luční	(*Cardamine pratensis*)
jitrocel větší	(*Plantago major*)	sítina rozkladitá	(*Juncus effusus*)
kakost smrdutý	(*Geranium robertianum*)	skřípina lesní	(*Scirpus sylvaticus)*
kerblík lesní	*(Anthriscus sylvestris)*	smetanka	(*Taraxacum ruderalis*)
knotovka bílá	(*Melandrium album*)	smolnička obecná	(*Viscaria vulgaris*)
kohoutek luční	(*Lychnis flos-cuculi*)	srha laločnatá	(*Dactylis glomerata*)
kokoška pastuší tobolka	(*Capsella bursa-pastoris*)	srstka obecná	(*Ribes uva-crispa*)
konopice pýřitá	(*Galeopsis pubescens*)	starček Fuchsův	(*Senecio ovatus*)
kontryhel obecný	(*Alchemilla vulgaris*)	starček lepkavý	(*Senecio viscosus*)
konvalinka vonná	(*Convallaria majalis*)	starček obecný	(*Senecio vulgaris*)
kopretina bílá	*(Leucanthemum vulgare)*	sveřep měkký	(*Bromus mollis*)
kopřiva dvoudomá	(*Urtica dioica*)	svízel bahenní	(*Galium palustre*)
kostřava červená	(*Festuca rubra*)	svízel lesní	(*Galium silvaticum*)
kostřava luční	(*Festuca pratensis*)	svízel povázka	(*Galium mollugo*)
kostřava ovčí	(*Festuca ovina*)	svízel přítula	(*Galium aparine*)
kozí brada luční	(*Tragopogon pratensis*)	svlačec rolní	(*Convolvulus arvensis*)
kozinec sladkolistý	(*Astragallus glycyphyllos*)	štírovník růžkatý	(*Lotus corniculatus*)
kuklík městský	(*Geum urbanum*)	šťovík menší	(*Rumex acetosella*)
lilie cibulkonosná	(*Lilium bulbiferum*)	šťovík tupolistý	(*Rumex obtusifolius*)
lipnice hajní	(*Poa nemoralis*)	tomka vonná	(*Anthoxanthum odoratum*)
lipnice luční	(*Poa pratensis*)	trojštět žlutavý	*(Trisetum flavescens)*
lipnice roční	(*Poa annua*)	třeslice prostřední	(*Briza media*)
lipnice úzkolistá	(*Poa angustifolia*)	třezalka tečkovaná	(*Hypericum perforatum*)
lnice květel	(*Linaria vulgaris*)	válečka lesní	(*Brachypodium sylvaticum*)
lopuch menší	(*Arctium minus*)	věsenka nachová	(*Prenanthes purpurea*)
máta huňatá	(*Mentha* x *rotundifolia*)	vesnovka obecná	(*Cardaria draba*)
medyněk měkký	(*Holcus mollis*)	vikev chlupatá	(*Vicia hirsuta*)
medyněk vlnatý	(*Holcus lanatus*)	vikev plotní	(*Vicia sepium*)
merlík všedobr	(*Chenopodium bonus-henricus*)	vikev ptačí	(*Vicia cracca*)
metlice trsnatá	(*Deschampsia cespitosa*)	vikev úzkolistá	(*Vicia angustifolia*)
metlička křivolaká	(*Avenella flexuosa*)	vlaštovičník větší	(*Chelidonium majus*)
mochna nátržník	(*Potentilla erecta*)	vlčí bob mnoholistý	(*Lupinus polyphyllus*)
mochna stříbrná	(*Potentilla argentea*)	vrbina penízková	(*Lysimachia nummularia*)
náprstník červený	(*Digitalis purpurea*)	vrbka úzkolistá	(*Chamaeneiron angustifolium*)
netýkavka malokvětá	(*Impatiens parviflora*)	zvonek okrouhlolistý	(*Campanula rotundifolia*)
netýkavka nedůtklivá	(*Impatiens noli-tangere*)	zvonek rozkladitý	(*Campanula patula*)

Tab. 2b. List of trees and bushes identified in the study area. – ***Tab. 2b.*** Seznam stromů a keřů zjištěných na studovaném území.

Czech name / český název	Latin name / latinský název	Czech name / český název	Latin name / latinský název
bez černý	(*Sambucus nigra*)	lípa srdčitá	(*Tilia cordata*)
borovice lesní	(*Pinus sylvestris*)	líska obecná	(*Corylus avellana*)
borůvka černá	(*Vaccinium myrtillus*)	maliník obecný	(*Rubus idaeus*)
brusinka obecná	*(Vaccinium vitis-idaea)*	modřín opadavý	(*Larix decidua*)
bříza bělokorá	(*Betula pendula*)	ořešák královský	(*Juglans regia*)
buk lesní	(*Fagus sylvatica*)	ostružiník křovitý	(*Rubus fruticosus*)
dub letní	(*Quercus robur*)	růže šípková	(*Rosa canina*)
hloh jednosemenný	(*Crataegus monogyna*)	slivoň domácí	(*Prunus domestica*)
hrušeň	(*Pyrus sp.*)	smrk ztepilý	(*Picea abies*)
jabloň	(*Malus sp.*)	šeřík obecný	(*Syringa vulgaris*)
jasan ztepilý	*(Fraxinus excelsior*)	topol kanadský	(*Populus* x *canadensis*)
javor klen	(*Acer pseudoplatanus*)	topol osika	(*Populus tremula*)
javor mléč	(*Acer platanoides*)	trnka obecná	(*Prunus spinosa*)
jeřáb ptačí	(*Sorbus aucuparia*)	trnovník akát	(*Robinia pseudoacacia*)
jilm horský	(*Ulmus glabra*)	třešeň	(*Cerasus sp.*)
jilm vaz	(*Ulmus Laevis*)	višeň	(*Cerasus sp.*)
jírovec maďal	(*Aesculus hippocastanum*)	vrba bílá	(*Salix alba*)
krušina olšová	(*Frangula alnus*)	vrba jíva	(*Salix caprea*)

Renaissance cesspit from Malá Strana in Prague

Renesanční jímka z pražské Malé Strany

Eine Renaissance-zeitliche Grube auf der Prager Kleinseite

Štěpán Rückl – Jan Havrda – Michal Tryml

Im vorliegenden Beitrag werden die Funde (vor allem Glas und Keramik) aus der Grabung einer Abfallgrube eines Bürgerhauses im Südteil der Kleinseite (Prag 1) veröffentlicht. Die Einzigartigkeit des Befundes liegt in der relativ kurzen Funktionsdauer der Grube, nachweislich nämlich nur 1609 bis 1656.

1. Location and circumstances of the excavation

Late medieval and early modern cesspits belong to structures exposed relatively often during archaeological excavations in historical city centres. The discovery of the cesspit found during the extensive rescue excavations in 2003-2006 in the southern part of Prague's Malá Strana in a block of houses demarcated by Újezd, Karmelitská, Harantova, Nebovidská and Helichova Streets is a typical example (*fig. 1*). The excavation was carried out by the archaeological department of the National Institute of the Care of Monuments, the territorial specialized department in Prague (project no. 20/03), as the result of the rebuilding of a baroque Dominican monastery into a hotel.

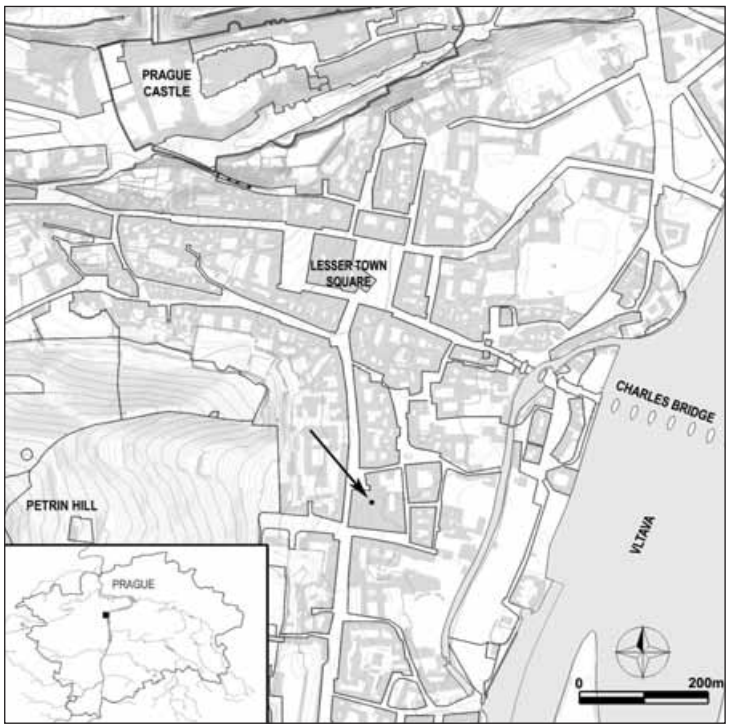

Fig. 1. Prague – Malá Strana, Karmelitská Street no. 387/III. The arrow marks the cesspit's location.
Drawing by J. Hlavatý.
Obr. 1. Praha – Malá Strana, Karmelitská čp. 387/III. Šipkou vyznačeno situování jímky.
Kresba J. Hlavatý.

2. Brief history of the location

The oldest significant human activity on the site was an early medieval fortification uncovered by the researchers. It comprised of a sizeable moat, and a wood and clay wall with a grate-like structure. The front wall was made of quarried arenaceous marl. Preliminary estimates place its construction in the 10th century and destruction in the 12th century (*Havrda – Tryml 2006*, 109). Settlement in the 12th and 13th centuries was revealed by a quantity of various objects, including wooden houses built on stone bedding. Later construction in the location is described by written sources. At the start of the 14th century, no later than 1329, a convent of the Sisters of the Magdalene Order was established here. Significant fragments of the end of the convent Church of Saint Mary Magdalene were uncovered in the construction of neighbouring house no. 387/III. The next stage can be called secular, and can be dated between the start of the Hussite revolution and the arrival of the Dominicans. Five or six

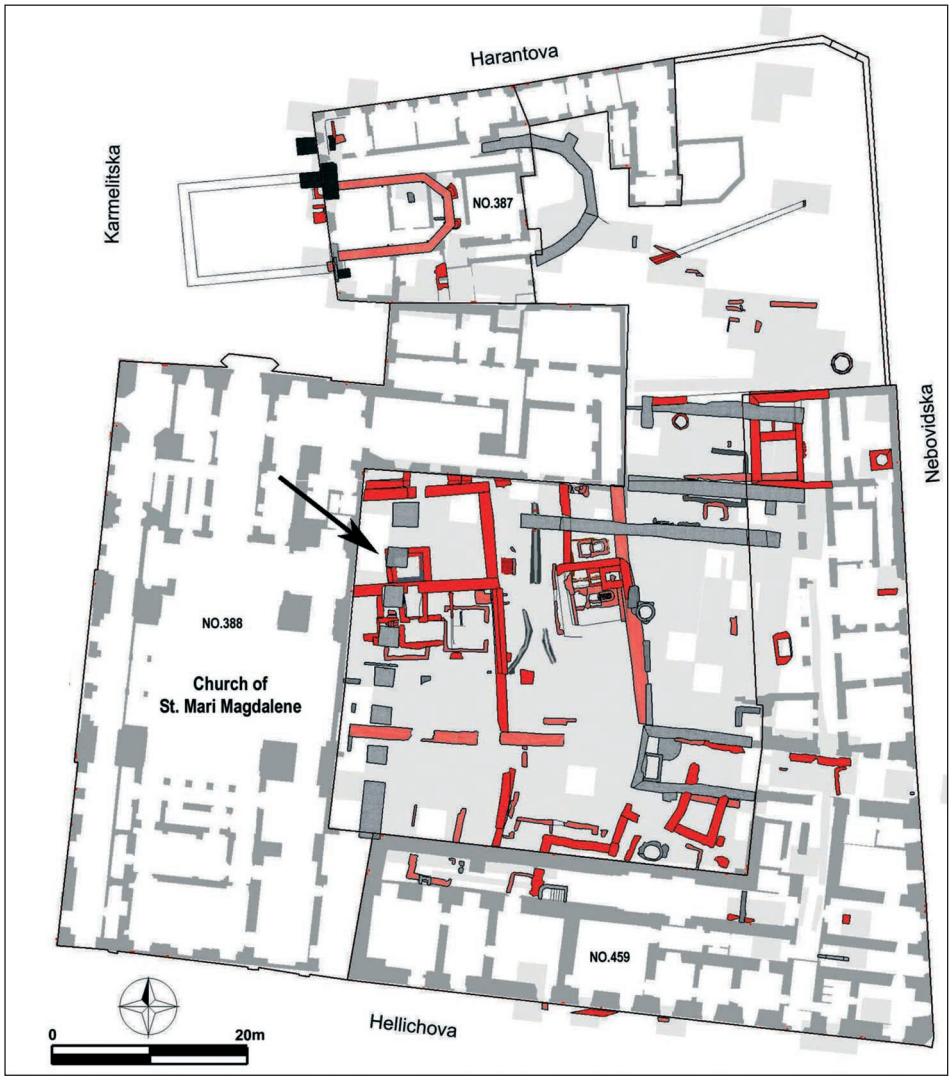

Fig. 2. Prague – Malá Strana. The grey-marked area is the site of the Baroque Dominican Monastery of Saint Mary Magdalene. The red-marked area is a pre-Baroque masonry revealed during the archaeological rescue excavation. The arrow marks the cesspit's location at the back of the lot.
Drawing by J. Hlavatý.
Obr. 2. Praha – Malá Strana. Šedě vyznačen areál barokního dominikánského kláštera sv. Máří Magdalény. Červeně vyznačeny předbarokní zděné konstrukce odkryté při záchranném archeologickém výzkumu. Šipka ukazuje na situování jímky v zadní části parcely.
Kresba J. Hlavatý.

Fig. 3. Prague – Malá Strana. The north-west part of the garth of the Dominican Monastery of Saint Mary Magdalene. Uncovered medieval to early modern structures at the back of the lot, including the cesspit (marked with an arrow) built on the site of a double-space oven. The older structures were altered in the second half of the 17th century by the construction of the western ambit of the monastery courtyard, of which the foundations of massive pillars survived.
Photo by J. Hlavatý.
Obr. 3. Praha – Malá Strana. Severozápadní část rajského dvora dominikánského kláštera sv. Máří Magdalény. Odkryté středověké až raně novověké konstrukce v zadní části parcely včetně jímky (vyznačena šipkou) vybudované na místě dvouprostorové pece. Starší konstrukce byly ve druhé polovině 17. století narušeny výstavbou západního ambitu klášterního dvora, z něhož se dochovaly základy mohutných pilířů.
Foto J. Hlavatý.

burghers' houses were built on the ruins of the convent, which were, after the order's arrival, purchased and progressively re-built or demolished. The site of developing Baroque monastery included both a medieval monastery church and town houses along Karmelitská Street. The foundation stone of the grand monastery Church of Saint Mary Magdalene was consecrated on 19 June 1656 (*Vlček et al. 1999*, 492). Unfortunately, the church's position along the road (north-south orientation) means that the main buildings belonging to the older phase of urban development were destroyed, or covered by its construction, and the researchers could only excavate the rear of the lots (*fig. 2*).

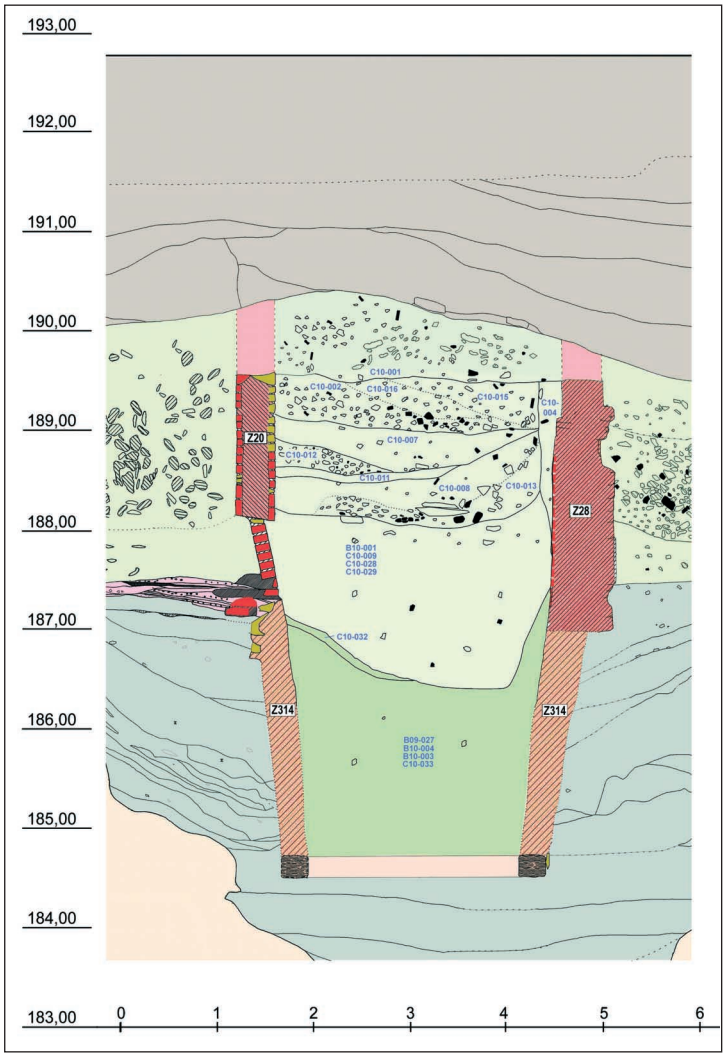

Fig. 4. Prague – Malá Strana. A lengthwise north-south section through the pit, view from the east. An early medieval ditch dug in the ground. A Renaissance cesspit was recessed into the infilling of the ditch.
Drawing by J. Hlavatý.
Obr. 4. Praha – Malá Strana. Podélný složený řez jímkou ve směru sever – jih, pohled od východu. Do podloží zahlouben raně středověký příkop. Do jeho výplně byla vložena renesanční jímka.
Kresba J. Hlavatý.

3. Field context

The Renaissance pit was discovered in the northwest part of the current courtyard. It was not built on a free space, but inside a late medieval oven (*fig. 3*). The almost square space of the oven's fire chamber was formed by walls (Z18, Z27 and Z28) made of quarried arenaceous marl with an inner brick face. They were set against the interior of the building's southern wall (Z20) on a joint. The oven included a forehearth semi-circular vaulted space (stokehold chamber) with several surviving floor levels. The fire chamber, which was sunk more than 2 metres into the then ground level, was deepened by a further 2.5 metres when it went out of service, and its peripheral walls were underpinned inside (including wall of building Z20) by a slanted retaining wall. This was made using masonry from quarried arenaceous marl placed on grey lime mortar (Z314). The crown of wall Z27 and part of walls Z18 and Z28 were re-done to suit the new needs of the building, and the vaulted stokehole was walled up with bricks at the same time. The body of the pit was extended to the infilling of the moat of the early medieval Malá Strana fortification. At the level of the foundation joint, oak beams with a cross-section of 28 x 35 cm were found under the retaining wall. The beam collar defined the square perimeter of the pit, 2 metres long on the inside (*fig. 4*).

The northwest corner of the pit was broken by a block of masonry (Z15H) with a ground plan of 200 x 185 cm. It was mostly made from quarried arenaceous marl of varying sizes, with a number of larger pieces joined together with a firm white lime mortar. Pieces of brick were only used in places. The masonry in question is part of the foundation walls of one of the pillars, from which the foundation strips bearing the perimeter masonry of the western part of the Baroque ambit run out (*fig. 5*).

The infilling of the pit could be divided into two basic levels. The upper was formed by strata of rubble backfill, mostly comprising fragments of marl (up to 40 %), bricks, tiles and blobs of mortar. This level arose more or less as a one-off,

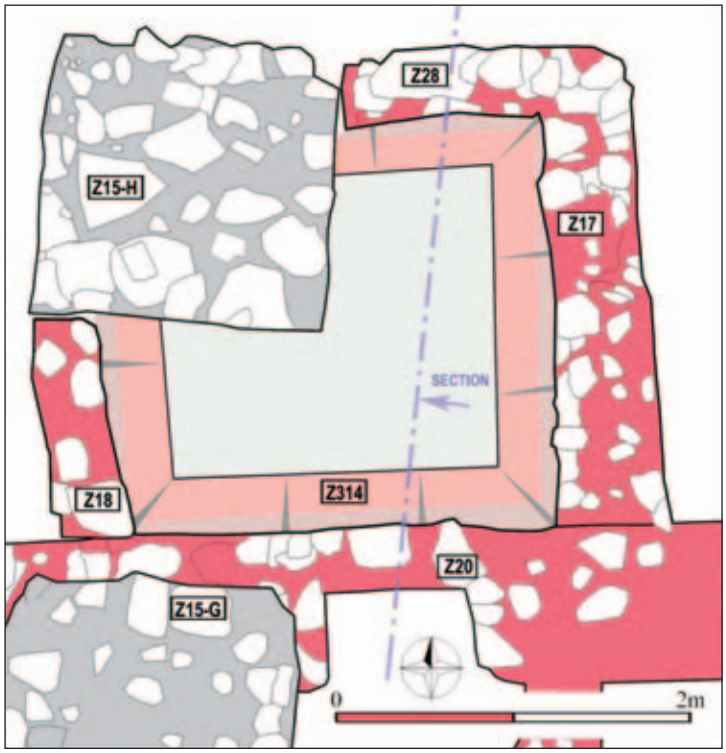

Fig. 5. Prague – Malá Strana. Ground plan of the cesspit. The construction of the older oven's fire chamber was used to build the pit, which was then supported by conically slanting walls. A collar made from oak beams was placed by the foundation joint. *Drawing by J. Hlavatý.*
Obr. 5. Praha – Malá Strana. Půdorys jímky. Pro výstavbu jímky byla využita dispozice konstrukce vytápěcí komory starší pece, která byla následně podezděna kónicky se svažujícími zdmi. Při základové spáře se nacházel věnec z dubových trámů. *Kresba J. Hlavatý.*

as a consequence of the demolition of the pre-monastery development. The lower part of the pit's infilling, almost 250 cm high, was represented by a typical faecal fill. It comprised strata of brown and dark brown soft clays with a very fertile mix of organic matter (*fig. 4*). As the level of underground water at the time of the excavation was relatively high, only the uppermost part of this infilling (down to a depth of less than one metre) could be archaeologically excavated. The lower part was extracted later when the site was excavated, and the wood of the foundation collar was revealed and raised.

4. Dating

Dendrochronological analysis showed that the oak beam came from a tree that was cut at the end of 1609, or the beginning of 1610 (*Kyncl 2005*). The cesspit was therefore very probably built a short time afterwards. It ceased to be used when the Dominicans, after buying the houses along Karmelitská Street, demolished them and started to build a new monastery church and then a monastery. It is hard to imagine there were houses in the street after 1656. Buildings at the rear of the lots could possibly still have stood, but evidently not for a long time. Written sources do not provide certainty about the year in which the western corridor of the ambit, whose foundation pillar broke the pit, was built along the long eastern side of the church.

With certain reservations, we can base further work on the assumption that the time interval in which the cesspit was used was between 1609 and 1656. The pit therefore served its purpose for a relatively short time, not more than half a century.

5. Finds[1)]

5.1 Glass

The collection of Renaissance glass from the pit's infilling comprises 234 fragments, of which 204 are hollow, and 29 are flat window glass. Due to their fragmented nature, it was not possible to determine whether 59 fragments were anything other than hollow or flat glass. As two types of infilling were distinguished when the pit was excavated (in the upper layers rubble backfill, in the lower layer a large amount of organic material), we will keep to this division in the following analysis of the collection. Given the general character of the rubble backfill, it can be expected that smaller artefacts will be in the lower parts, or may even fall into the lower organic layer. In our case, this process is clearly documented by one example of a cylindrical beaker on a bell-shaped foot, decorated with enamel, fragments of which were found in both infillings (see below). The collection of glass in the lower organic infilling, which arose

Note 1:
We would like to thank the following for their many comments and willingness to discuss the material presented here: Z. Černá, J. Podliska, H. Sedláčková, F. Suchomel, V. Štajnochr, P. Vařeka and J. Žegklitz. J. Hlavatý, J. Křepelová and L. Miková, without whose devoted help this article would never had been published, also deserve our thanks.

over a longer time period during the use of the cesspit, is evidently contaminated by later intrusive material. In contrast, the rubble backfill is very probably the result of a more or less one-off backfilling, and thus it represents the context the origin of which – according to written sources – ranges within the bounds of few years at most.

5.1.1 Finds of glass from rubble backfill

A total of 137 fragments of hollow and flat glass were recorded in the upper rubble backfill (*figs. 6, 7*).

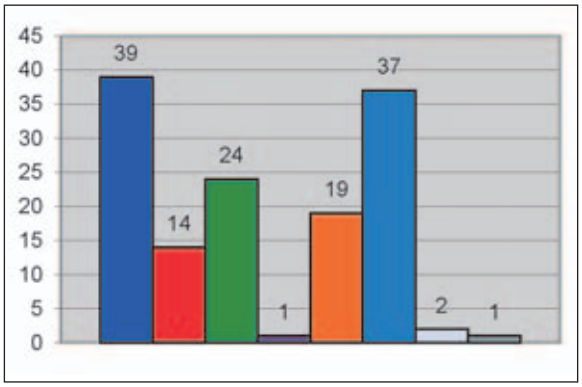

Fig. 6. Numbers of registered types of glass (upper rubble backfill). Dark blue - goblets; red – beakers; green – bottles; dark red – technical and laboratory glass; orange – window glass; blue – unidentified (hollow) glass; light blue – unidentified (flat) glass; grey – varia.
Obr. 6. Početní zastoupení registrovaných typů skla (svrchní suťový zásyp). Tmavě modrá – poháry; červená – číše; zelená – lahve; tmavě červená – technické a laboratorní sklo; oranžová – okenní sklo; modrá – neurčené (duté sklo); světle modrá – neurčené (ploché sklo); šedá – varia.

5.1.1.1 Hollow glass

The collection of hollow glass from the upper rubble backfill comprises 125 fragments. Table glassware is dominant. 37 fragments could not be morphologically identified due to their fragmentariness.

Goblets

Goblets are, statistically, the most significant group in the collection (39 fragments). There are both pieces with a higher degree of luxury, and more accesible products of a lesser quality.

A discoid foot made from clear colourless glass with small bubbles, with one depressed ringlet and part of a hollow baluster node, is a fragment of luxurious goblet in the "Venetian style" (*fig. 8: 1*), as is the lower part of a goblet bowl with relief decoration in the form of drops, also made from high quality colourless glass with small bubbles. The drops are in two rows, the lower with a vertically drawn thread which forms relief ribs at the very bottom (*fig. 8: 2*). We can find similar examples in Prague and Olomouc (*Podliska 2003*, 27; *Sedláčková 1998*, cat. no. 13.2-4, probably a home-made product). Based on the quality and similarities of the molten glass, it is possible to assert that they are fragments of the same goblet, of a type which was only used by the highest social class (*Drahotová et al. 2005*, 165). The possibility that it may come from a Dutch glassworks cannot be excluded (*Henkes 1994*, 209, figs. 46.17, 46.18).

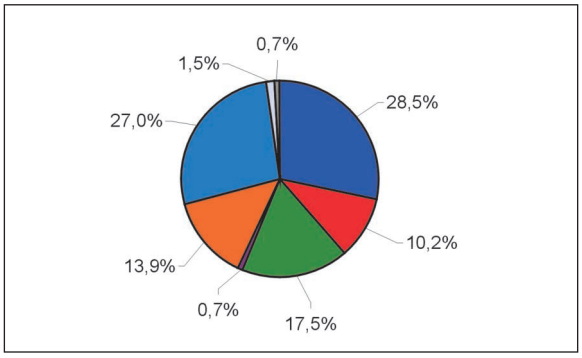

Fig. 7. Percentages of registered types of glass (upper rubble backfill). Dark blue - goblets; red – beakers; green – bottles; dark red – technical and laboratory glass; orange – window glass; blue – unidentified (hollow) glass; light blue – unidentified (flat) glass; grey – varia.
Obr. 7. Procentuální zastoupení registrovaných typů skla (svrchní suťový zásyp). Tmavě modrá – poháry; červená – číše; zelená – lahve; tmavě červená – technické a laboratorní sklo; oranžová – okenní sklo; modrá – neurčené (duté sklo); světle modrá – neurčené (ploché sklo); šedá – varia.

Of the lower quality types, we can mention two solid, bell-shaped feet with a part of stem formed by two ringlets made from clear, greenish and yellowish glass with bubbles and small grains of sand, of which one has part of a semi-ovoid bowl; also a thin-walled bell-shaped foot with two ringlets of stem made from greenish glass with small bubbles (*fig. 8: 3, 4, 5*); and, lastly, an example of a goblet with a conical bowl on a twisted stem, and with a foot from spirally-coiled fibre made from clear colourless glass with bubbles (*fig. 8: 7*). A similar foot with a twisted stem from greenish glass with bubbles also survived (*fig. 8: 6*).

Beakers

Fourteen fragments represent three types of beakers. The first type is a luxury cylindrical beaker (its lower part) on a hollow bell-shaped foot (so-called humpen), decorated with enamel painting (*fig. 9: 1*). The beaker was stuck

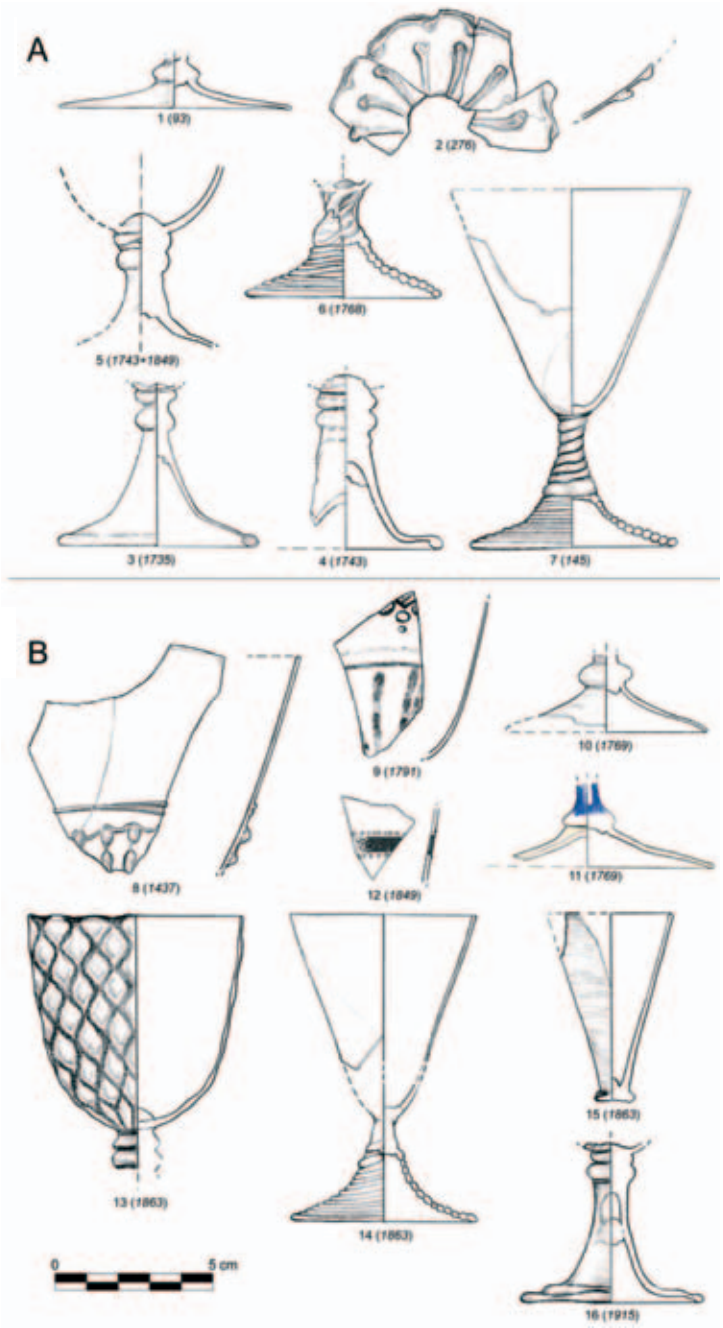

Fig. 8. Goblets: A – upper rubble backfill; B – lower faecal infilling.
Obr. 8. Poháry: A – svrchní suťový zásyp; B – spodní fekální výplň.

together from 5 fragments, of which the 3 smallest ones were found in the lower organic infilling, and therefore document its contamination by intrusive material. The enamel decoration represents a female figure (from the waist down) in Renaissance clothing (a long skirt gathered in at the waist, with an apron and narrow sleeves, extended at the top); a small angel approaches her from the left, and gives her a basket of flowers. The scene is supplemented by simple floral motifs and by a row of white points around the perimeter of the bottom. A precise parallel of the scene cannot be found, but we can speculate that this was a betrothal or wedding festive goblet, and assume that there was a male figure on the opposite side that has not survived. The rim with a gilded border supplemented with white enamel points belongs probably to the identical beaker (*fig. 9: 2*).

The second type, which is less luxurious and therefore more readily available, is represented by smaller, cylindrical or slightly conical beakers with optical decoration, and a slightly pricked bottom wound around with fibre. There are two examples present in our collection. The first, which survived in the whole profile, is a slightly conical beaker made from translucent, cobalt blue glass with small bubbles, with a slightly pricked bottom wound around with pinched fibre, and with optical decoration in the form of markedly embossed lentiles (*fig. 9: 3*). The second is a fragment from a beaker made from translucent greenish glass with bubbles, with a pricked bottom wound around with simple fibre (*fig. 9: 4*). The beaker bears lentile-shaped optical decoration. This type of beaker appears in the Czech lands from the end of the 16th century (*Drahotová et al. 2005*, 163).

One fragment of an outwards bent rim with part of a bowl (*fig. 9: 5*) is probably part of a slightly conical beaker wound around with fibre and then blown in a mould ("waffel" decoration). This shape appears in the Czech lands from the end of the 16th century. The models can probably be found among products from Dutch glassworks (*Drahotová et al. 2005*, 163; *Tait 1967*; *Henkes 1994*, 132-136).

Bottles

Bottles are represented by 24 fragments. Unfortunately, no whole shape has survived, so our knowledge of the bottles' forms is based mostly on fragments of the bottoms. We can state with certainty that these were tetrahedral bottles, with bottom dimensions from 46 x 46 mm to 76 x 76 mm, bottles with a circular bottom whose diameter ranges from 35 to 90 mm, and one hexahedral small bottle. The fragments are made from clear colourless, greyish and greenish glass (*fig. 10: 1, 2, 3*).

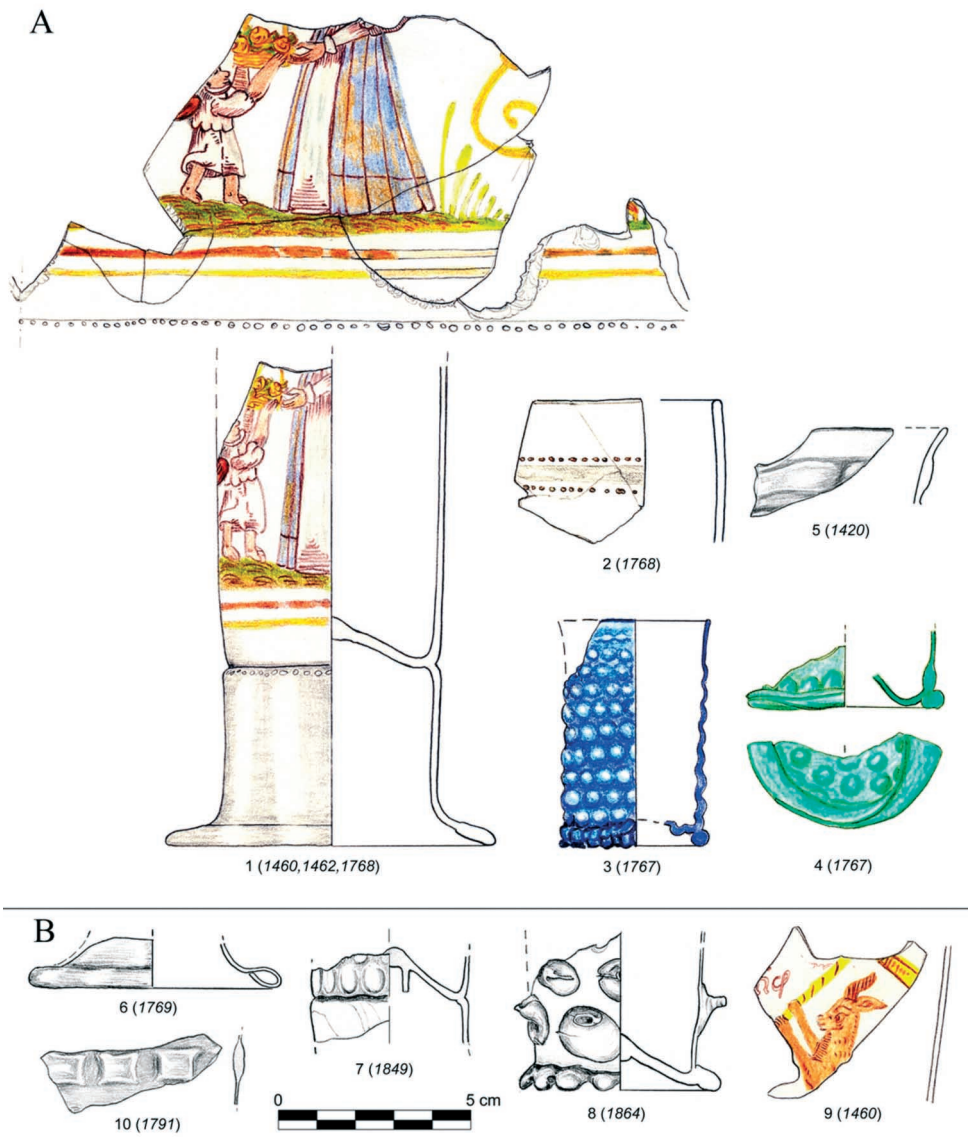

Fig. 9. Beakers: A – upper rubble backfill; B – lower faecal infilling.
Obr. 9. Číše: A – svrchní suťový zásyp; B – spodní fekální výplň.

Laboratory and technical glass

Only one fragment can be classified as laboratory glass. It is a fragment of a cylindrical vessel with a collar-like rim and an optical decoration of ribs (*fig. 10: 4*). This type was probably used in pharmacy for storing ointments and other substances, and is usually called albarello (*Drahotová et al. 2005*, 169).

Other hollow glass fragments

Two hollow glass fragments that cannot be precisely classified are worth mentioning, due to their unusual nature. The first is a fragment of a thin-walled vessel (thickness of 0.6 mm) made from greenish glass with a small turned prunt, the second a hollow glass fragment made from opaque, milk-coloured, light blue glass with part of enamel decoration in yellow and brown (*fig. 11: 1, 2*).

5.1.1.2 Window glass

As illustrated by excavations performed in various parts of Prague over the last fifteen years, fragments of window glass of this period at the collections excavated in Prague are an entirely ordinary phenomenon (*Podliska 2003*, 29). There are 19 fragments of window glass from the rubble backfill, which represent represent 15 % of the whole collection. They can be typologically

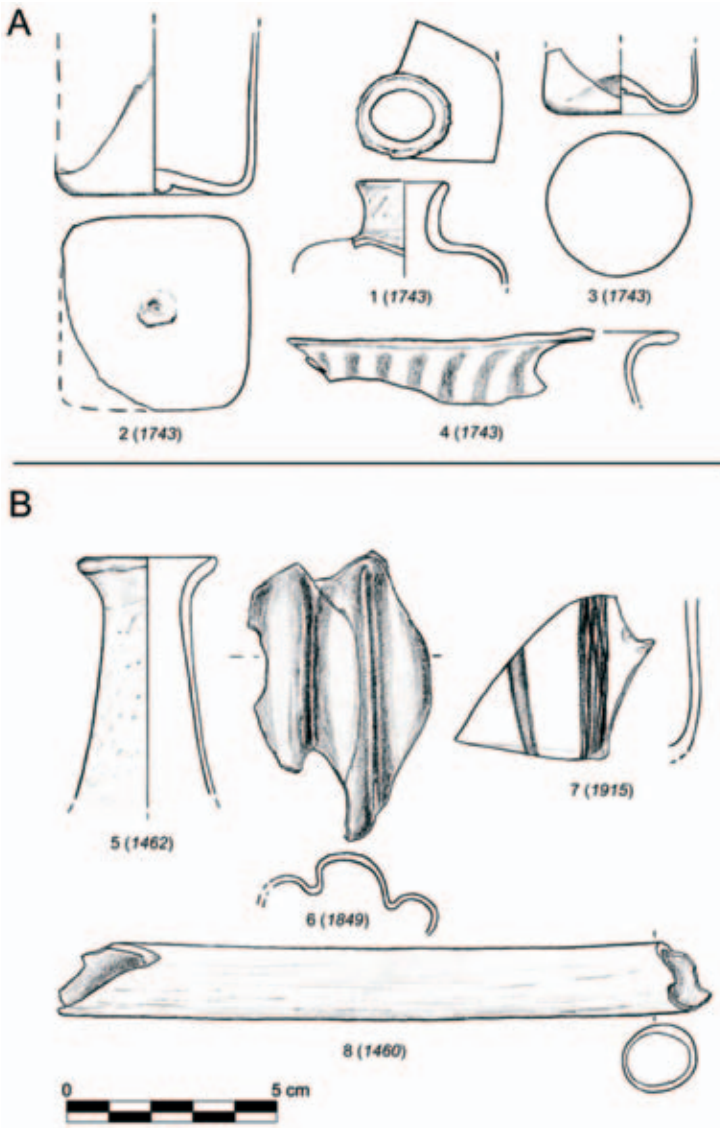

Fig. 10. Bottles, laboratory and technical glass.
Obr. 10. Lahve a laboratorní a technické sklo.

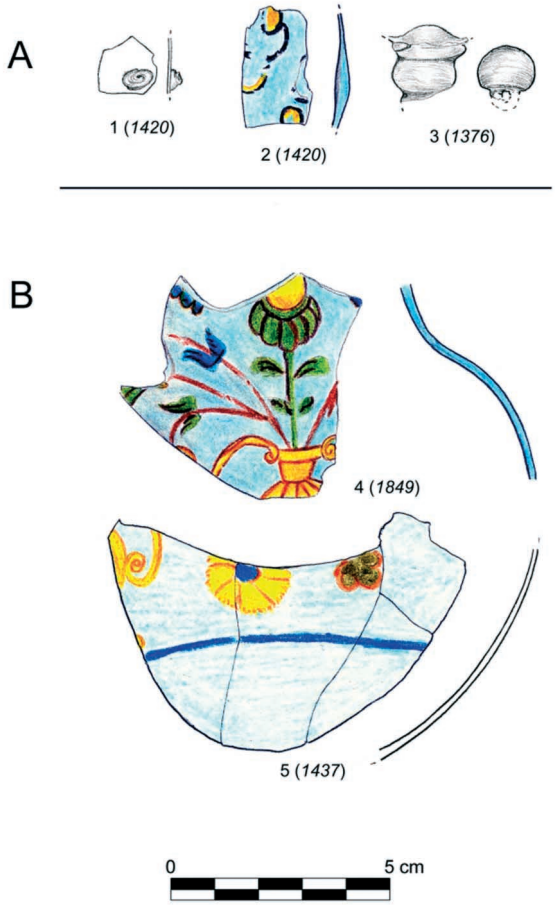

Fig. 11. A – Unclassifiable fragments from the upper rubble backfill; B – jugs and tankards from the lower cesspit contents.
Obr. 11. A – nezařaditelné fragmenty ze svrchního suťového zásypu; B – džbány a konvice ze spodní fekální výplně.

divided into 3 groups: window discs, panels from between window discs, and window panes of various shapes (most frequently oblong). All of them are markedly fragmented.

Statistically, the most important group are the round window discs (13 fragments) from colourless, greenish (lighter and darker shades) and greyish glass, with simple sealed or hollow folded rims (some sealed rims are slightly thickened – *fig. 12: 1-3*). The window discs are 1-3 mm thick, with the diameter of 80-130 mm. In one case a disc was of an oval shape (*fig. 12: 3*). The second group comprises two fragments of triangles from clear greenish and slightly yellowish to colourless glass, which served as infilling between a round window discs. The rims of the triangles are slightly concave, and in the case of the first fragment there are marked traces of pinching (*fig. 12: 4*). Unusually, the second fragment has a part of the lead frame (*fig. 12: 5*). The thickness of the fragments is 1.4 and 1.7 mm. The third group contains only one fragment. This is a corner of a right-angled window pane made from clear colourless glass. The pane is 2 mm thick (*fig. 12: 6*). The shape of three fragments of flat glass with one preserved rim with traces of pinching could not be determined in more detail (*fig. 12: 6*).

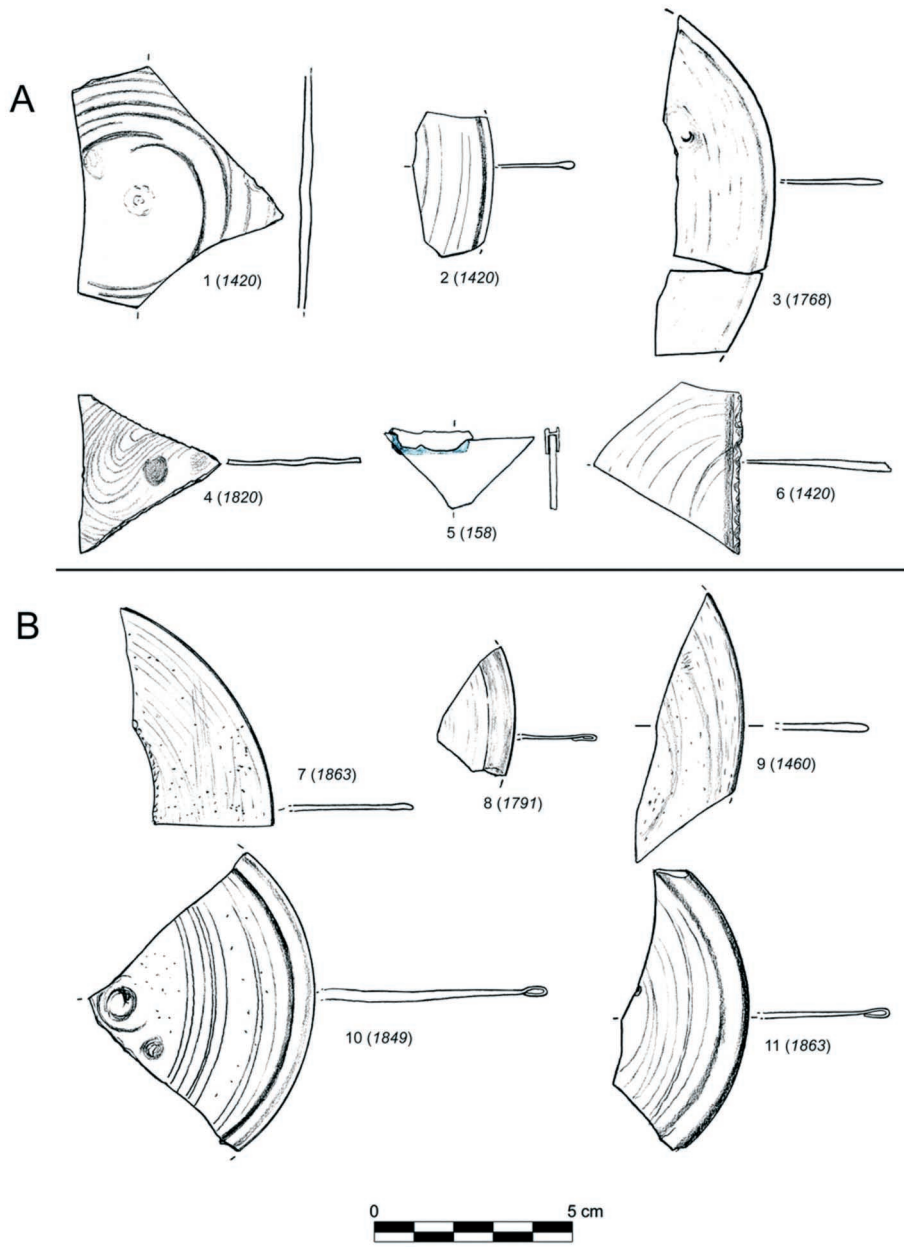

Fig. 12. Window glass:
A – upper rubble backfill;
B – lower faecal infilling.
Obr. 12. Okenní sklo:
A – svrchní suťový zásyp;
B – spodní fekální výplň.

5.1.1.3 Varia

The rubble backfill contained a button of a loaf-like shape and circular cut, made from opaque black glass. Fragments of a sealed iron tie have survived on the flat side (*fig. 11: 3*).

5.1.2 Finds of glass from the lower faecal fill

A total of 97 fragments of hollow and flat glass were found in the lower cesspit level (*fig. 13, 14*). Unfavourable influences at the time of the excavation (raised underground water level) meant it was only possible to excavate the upper parts of the organic contents. The collection comes therefore from the end of the cesspit's use, and it can be dated with high probability to the second quarter of the 17th century. As mentioned above, the cesspit contents were contaminated by intrusions from the upper rubble backfill.

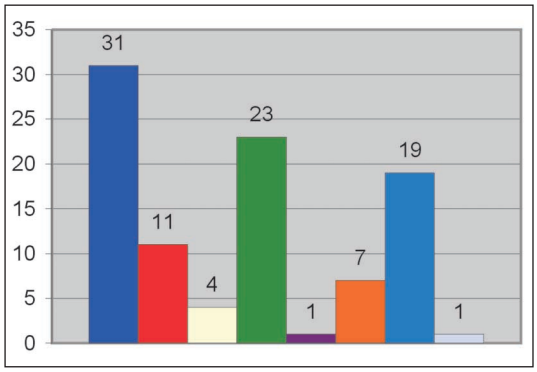

Fig. 13. Numbers of registered types of glass (lower faecal infilling). Dark blue – goblets; red – beakers; yellow – jugs, tankards; green – bottles; dark red – technical and laboratory glass; orange – window glass; blue – unidentified (hollow) glass; light blue – unidentified (flat) glass.
Obr. 13. Početní zastoupení registrovaných typů skla (spodní fekální výplň). Tmavě modrá – poháry; červená – číše; žlutá – džbány, konvice; zelená – lahve; tmavě červená – technické a laboratorní sklo; oranžová – okenní sklo; modrá – neurčené (duté sklo); světle modrá – neurčené (ploché sklo).

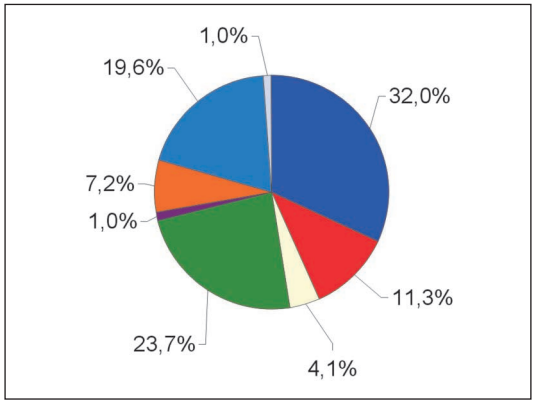

Fig. 14. Percentages of registered types of glass (lower cesspit contents). Dark blue – goblets; red – beakers; yellow – jugs, tankards; green – bottles; dark red – technical and laboratory glass; orange – window glass; blue – unidentified (hollow) glass; light blue – unidentified (flat) glass.
Obr. 14. Procentuální zastoupení registrovaných typů skla (spodní fekální výplň). Tmavě modrá – poháry; červená – číše; žlutá – džbány, konvice; zelená – lahve; tmavě červená – technické a laboratorní sklo; oranžová – okenní sklo; modrá – neurčené (duté sklo); světle modrá – neurčené (ploché sklo).

5.1.2.1 Hollow glass

The collection of hollow glass from the lower cesspit contents comprises 85 fragments. A dominant position is occupied by table glassware. 19 fragments could not be morphologically identified, owing to the extent of fragmentariness.

Goblets

Fragments of goblets are the most numerous group in the collection (31 fragments). As in the upper rubble backfill, there are both expensive, luxury examples, and a larger amount of more commonly available types of poorer quality.

The examples that are more luxurious and demanding in terms of craftsmanship are two discoid feet with a depressed ringlet and a partially preserved hollow baluster node (*fig. 8: 10, 11*), in one case from cobalt blue glass. Glass is clear, colourless and slightly yellowish. A find of a fragment of a conical bowl whose lower part is decorated with two rows of molten drops is quite unique (the lower row has a vertically drawn thread which thus forms three-dimensional ribs). The decoration is divided from the upper part by a horizontal fibre (*fig. 8: 8*). The high quality of the product is shown by the absence of any signs of corrosive activity, as well as the exceptionally clean, clear colourless glass with no bubbles. Sporadic parallels can be found in Prague and Olomouc (*Podliska 2003*, 27; *Sedláčková 1998*, cat. no. 13.2-4). Although it is impossible to rule out the possibility that these pieces were imported from Dutch production centres (cf. *Henkes 1994*, 209, fig. 46.18), without a chemical analysis its origin cannot be determined with certainty. The aforementioned examples are very high-quality products in the Venetian style. In our environment we encounter them primarily in the context of high society (*Drahotová et al. 2005*, 165).

The more expensive products include a fragment of a bowl with a gilded border and white enamel points (*fig. 8: 12*), as well as a fragment of the lower part of a conical bowl decorated with vertical lines separated from the upper part by two horizontal lines (*fig. 8: 9*). The decoration was executed with white enamel and represents an imitation of goblets with embossed ribs from molten fibres of white, milk-coloured glass (see *Henkes 1994*, 201-202, fig. 46.2, 46.3). The upper section contains part of a gilded rhombus, probably from a four-pointed star. The point of the rhombus is framed by four white enamel circles that could imitate a decoration of small glass beads (the combination of a gilded star and such beads appeared on a goblet from Brno, see *Jordánková – Sedláčková 2005*, 130-131, appendix no. III/4). We can find parallels, for example, in Olomouc, where these goblets are dated to the end of the 16th or beginning of the 17th century (*Sedláčková ed. 1998*, 86, cat. no. 16.1-4, 16.1-5).

Of the more ordinary types we can point to bell-shaped feet with two ringlets on a smooth stem, made from clear greenish glass (2 examples, one with a very asymmetrically-shaped rim of the foot – *fig. 8: 16*), fragments of a goblet with a twisted stem on a foot from spirally-wound fibre made of clear greyish glass (*fig. 8: 14*) and a semi-ovoid bowl with two ringlets of the stem made from clear

greyish glass, with optical decoration in the form of rhombuses (*fig. 8: 13*). In all cases there are bubbles in the glass.

Two examples of "liqueur" cups have unusual shapes (*fig. 8: 15*). They are fragments of a small conical bowl, made from clear greenish glass with a rim diameter of only 40 mm and a height of 58 mm. A similar, slightly smaller cup came from a Renaissance glassworks in Rejdice (*Hejdová 1981*, fig. 9: 15, called a beaker here). According to this parallel, the bowl would sit on a very low foot made from spirally-wound fibre.

Beakers

Beakers are represented by 11 fragments (including 3 intrusive fragments, see below) in the collection from the earlier pit contents. The shape of a beaker on a bell-shaped foot is represented by a foot fragment from clear greenish glass with bubbles (*fig. 9: 6*). A variant of this type is represented by a bottom with part of a bell-shaped foot, and with a body bearing lentile-shaped optical decoration, made from clear greenish glass with bubbles. There are very marked traces of a blowpipe and imprecise cutting off on the lower side of the bottom. Moreover, the bell-shaped foot is not symmetrical, and deviates on one side. It is therefore a curious case of faulty (and therefore cheaper) product amongst ordinary consumer goods (*fig. 9: 7*).

Three fragments of an enamel-painted beaker belong to the aforementioned wedding humpen from the upper rubble backfill and therefore document the contamination of the lower layer by intrusive material, due to the influence of post-deposit processes. The only other example of figural decoration on a beaker is a fragment with the figure of a rabbit (*fig. 9: 9*). The rabbit appears in an upright position on its back legs; in its forepaws it holds a pole to the upper end of which a ribbon is probably attached. Three letters of a word that has not survived are visible by the left edge of the fragment (...ich – mich? dich? sich?). The scene can be included in the group of fables that appeared on hollow glass in the Czech environment from the end of the 16th century (*Drahotová 1985*, 84; see also *Henkes 1994*, 181, fig. 43.1-2).

A fragment of a berkemeier- or römer-type beaker made from clear greenish glass with small bubbles is a significant find, documenting the relative wealth of its owner (*fig. 9: 8*). As only the cylindrical body, without the upper bowl-like part, was found, the goblet cannot be classified exactly. The body is decorated with large spiky prunts. The slightly pricked bottom is wound around with pinched fibre. We usually encounter this shape in the most important sets in our domestic environment (*Drahotová et al. 2005*, 164).

Four fragments document a beaker with "waffel" decoration (*fig. 9: 10*; for the production and origin of such beakers see *Tait 1967*).

Jugs and tankards

Five fragments of opaque, milky bluish glass, decorated by enamel paintwork with the motif of an amphora-type vase with flowers, probably belong to a jug or tankard (*fig. 11: 4, 5*).

Bottles

There are 23 fragments of bottle-like shapes. The preserved pieces are again very fragmentary, so shape analysis is markedly limited. Tetrahedral and cylindrical bottles of small and large dimensions are documented. A conical neck with a widening rim is probably part of a pear-shaped bottle (*fig. 10: 5*).

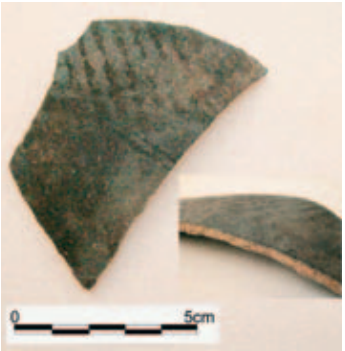

Fig. 15. Fragment of newly defined ceramic class P5013. *Photo by J. Hlavatý.*
Obr. 15. Fragment nově definované keramické třídy P5013. *Foto J. Hlavatý.*

Less usual are two fragments of a lobed bottle, and one fragment of a multi-sided bottle from filigree glass with white fibres (*vetro and fili e retorti – fig. 10: 6, 7*). The colour of the clear glass of the fragments ranges from colourless to various shades of green.

Laboratory and technical glass

The only representative of this group is a slightly narrowing distillation pipe made from clear, slightly greenish glass with a maximum diameter of 18 mm and a length of 153 mm (*fig. 10: 8*). More specific identification is not possible.

5.1.2.2 Window glass

Only 7 fragments of window glass were found in this pit's contents. In five cases they are pieces of round window discs made from clear greenish and colourless or yellowish glass, with simply sealed or a hollow folded rim (*fig. 12: 7-11*). The window discs are 1-2 mm thick, with diameters of 90 and 120 mm. One fragment of window glass bears traces of pinching on a preserved rim. In one case there is a flat pane with a simple sealed rim.

Fig. 16. Selection of ceramics finds. Class 5001: 1, 2, 3; class 5002: 4, 5, 6; class 5010: 7, 8, 9; class 5011: 10, 11, 12, 13, 14, 15, 16.
Obr. 16. Výběr z nálezů keramiky. Třída 5001: 1, 2, 3; třída 5002: 4, 5, 6; třída 5010: 7, 8, 9; třída 5011: 10, 11, 12, 13, 14, 15, 16.

5.2 Earthenware, stoneware, majolica, porcelain

The collection of ceramics was analysed using a descriptive system proposed by P. Vařeka (*Vařeka 1998*), based on the observation of macroscopically apprehensible properties of ceramic matter. According to this system, modern Prague ceramics have the code P500x. 12 classes of ceramics were previously defined (P5001-P5012 – see *Dohnal – Vařeka 2002*, 253-254) and we added one new one (P5013 – *fig. 15*). Neither the stoneware nor the porcelain from this collection has yet been analysed in this way. As the only published collection of modern Prague ceramics to which this system was applied is also, at least partially, contemporary with our set (see *Dohnal – Vařeka 2002*), the use of this method for the possibility of comparison is recommended.

Registered ceramics classes (fig. 16):

Properties described[2)]*:*

B – colour
M – material, technology (macroscopic description of ceramic matter, creation of vessels, surface finish)
V – firing (quality, character)
G – glaze (type, location, colour)

P5001

B – white to greyish-white

M – very high-quality compact potsherd, sparse macroscopic non-plastic components (max. 1 mm), indistinct minute mica, smooth surface of potsherd, traces of turning on a wheel

V – hard oxidation firing

G – transparent inner, outer and double-sided glaze; colour – clear, brown, light green, rich green, yellow, dark blue, and brown and violet.

P5002

B – brick red

M – high-quality compact potsherd, sparse macroscopic non-plastic components (max. 1 mm), indistinct minute mica, smooth surface of potsherd, traces of turning on a wheel

V - hard oxidation firing

G – transparent inner, outer and double-sided glaze; colour – clear, brown, green, yellow

P5003

B – ochre, light brown, greyish brown

M – very fine-grained potsherd, indistinct macroscopic non-plastic components (up to a size of 1 mm, larger grains only very occasionally), occasional minute mica, smooth surface, traces of turning on a wheel

V – hard oxidation firing

G – transparent inner, outer and double-sided glaze; colour – clear, brown, green, yellow

P5005

B – grey

M – Fine-grained potsherd, macroscopic non-plastic components mostly up to a size of 1 mm, numerous minute mica, smooth, fine surface, often marked traces of polishing, traces of turning on a wheel

V – hard reduction firing

Note 2:
See Dohnal - Vařeka 2002, 253-254. It should be mentioned that there have been several changes to the system of ceramic classification for modern Prague ceramics since the publication of the collection from náměstí Republiky (Republic Square): class P5010 has been separated from class P5001, class P5002 belongs to a finer variant of the original coarser brick-red ceramics, which is now called P50 (P. Vařeka, verbal communication).

P5006

B – grey

M – fine-grained potsherd, macroscopic non-plastic components up to a size of 1 mm, occasionally larger, numerous minute mica, grains protruding from the surface, smooth to rough surface of potsherd, traces of turning on a wheel

V – hard reduction firing

P5010

B – ochre, yellow and white, pinkish

M – very high-quality compact potsherd, macroscopic non-plastic components (up to max. 1 mm), indistinct minute mica, smooth surface of potsherd, sometimes grains protruding from the surface, traces of turning on a wheel

V – hard oxidation firing

G – transparent inner, outer and double-sided glaze; colour – brown, light green, yellow, orange

P5011

B – brick red

M – markedly grainy potsherd, densely non-plastic components up to a size of 1 mm (occasionally larger), indistinct minute mica, slightly grained surface (non-plastic components protruding from the surface), traces of turning on a wheel

V – hard oxidation firing

G – transparent inner, outer and double-sided glaze; colour – clear, brown, green

P5013

B – light grey core, dark grey near the surface

M – fine-grained potsherd, macroscopic non-plastic components up to 1 mm, numerous minute mica, polished surface, traces of turning on a wheel

V – hard reduction firing

5.2.1 Finds from the lower faecal fill

A total of 970 ceramic fragments weighing 18,644 g were found in the lower layer.

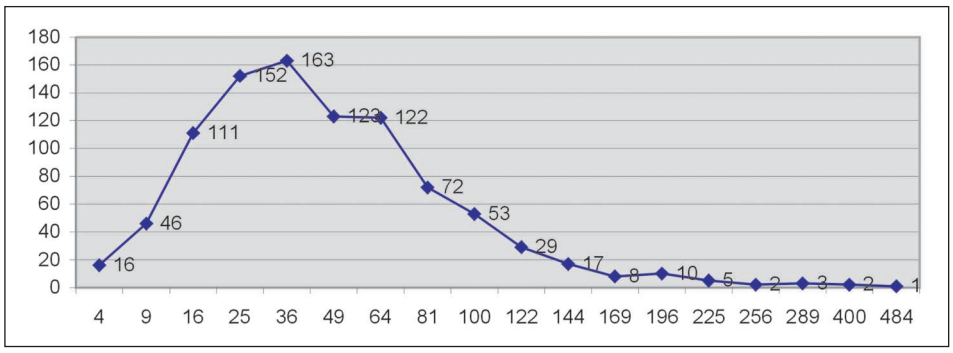

Fig. 17. Representation of size categories of fragments (lower faecal layer). Horizontal axis – size of fragments in cm^2; vertical axis – number of fragments.
Obr. 17. Zastoupení velikostních kategorií fragmentů (spodní fekální vrstva). Vodorovná osa – velikost fragmentů v cm^2; svislá osa – počet fragmentů.

5.2.1.1 Fragmentariness (*fig. 17*)

To determine the degree of fragmentariness, each fragment was allocated to one of 22 size categories (1 – 1 cm^2, 2 – 4 cm^2, 3 – 9 cm^2, 4 – 16 cm^2, 5 – 25 cm^2, 6 – 36 cm^2, 7 – 49 cm^2, 8 – 64 cm^2, 9 – 81 cm^2, 10 – 100 cm^2, 11 – 121 cm^2, 12 – 144 cm^2, 13 – 169 cm^2, 14 - 196 cm^2, 15 – 225 cm^2, 16 – 256 cm^2, 17 – 289 cm^2, 18 – 324 cm^2, 19 – 361 cm^2, 20 – 400 cm^2, 21 – 441 cm^2, 22 – 484 cm^2; see *Dohnal* –

Vařeka 2002, 257-258). The collection is dominated by medium-sized fragments (the most common categories are 4-9), which corresponds to our idea about the primary deposit of ceramic waste in the cesspit. Also the presence of pieces in categories 12-17, 20 and 22 shows the lesser degree of fragmentariness of the ceramics.

5.2.1.2 Registered ceramics classes, morphology, typology (*figs. 18, 19*)

The most numerous ceramics in the lower cesspit layer are oxidation fired pieces from class P5010 (amount: 70 %, weight: 63 %), followed by reduction fired ceramics from class P5005 (amount: 13 %, weight: 12 %) and ochre to grey-white oxidation fired ceramics from class P5003 (amount: 6 %, weight: 4 %). Oxidation fired brick-red ceramics from classes P5002 and P5011 amount to 6 % of the total amount (11 % of the weight). Other classes amount to less than 3 % of the total amount in the set (class P5001, only 2 % of the total amount and 3 % of the weight, class P5006 2 % of the total amount and 7 % of the weight; class P5013 is represented by a single fragment). Oxidation fired goods from classes P5001-P5003, P5010 and P5011 therefore amount to 84 % of the total amount and completely dominate the collection, although reduction fired goods from classes P5005 and P5006 play a non-negligible role (15 % of the total amount, 19 % of the weight).

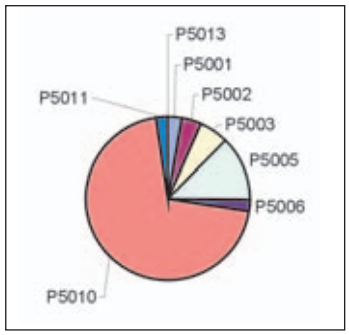

Fig. 18. Percentages of ceramic classes (lower faecal layer).
Obr. 18. Procentuální zastoupení keramických tříd (spodní fekální vrstva).

87 % of the oxidation fired ceramics in classes P5001-P5003, P5010 and P5011 are glazed. Inner glaze was noted on 66 % of fragments, double-sided on 20 %, and fragments with outer glaze amount to a mere 1 %. The ratio of fragments with inner glaze, outer glaze and double-sided glaze in the various classes is shown on the graph (*fig. 20*), which makes it clear that, with the exception of class P5011, where unglazed goods appear most frequently, all other oxidation fired classes are dominated by inner glaze. The most popular coloured glazes are yellow, brown and green. Rich green, brown and blue glazes were used on ceramics in class P5001 (cf. *Dohnal – Vařeka 2002*, 261-262).

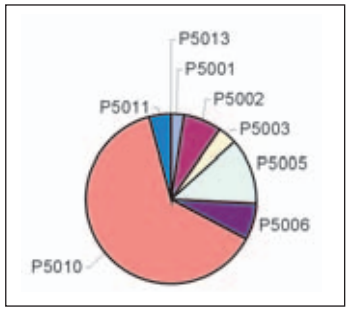

Fig. 19. Weight representation of ceramic classes (lower faecal layer).
Obr. 19. Hmotnostní zastoupení keramických tříd (spodní fekální vrstva).

Of a total of 257 morphologically identifiable fragments in the collection, the vast majority are from pots (73 %), followed by tripods/pans (12 %) and flanged bowls (8 %). There are a few examples of other shapes (lids 2 %, deep bowls 2 %, jugs 1.5 %, cups and dishes amount to less than 1 %). The collection is therefore markedly dominated by cooking utensils, and there is a minimum amount of table ceramics.

Of 16 determinable fragments in class P5001, the most frequently occurring were flanged bowls (12), pots (2) and jugs (2). The most numerous type in class P5002, where there were a total of 13 determinable fragments, were pots (7), followed by flanged bowls (3). There was one example each of a conical bowl with high vertical handles, a tripod and a lid. In class P5003, of 7 identifiable fragments the majority were pots (5); there was only one tripod and one lid. Classes P5005 and P5006 are dominated by pots (19 pieces from a total of 21 fragments), there were 2 jug fragments, and other shapes were only represented by one fragment (lid, deep bowl – *fig. 21: 5*). The statistically most important class, P5010, is again dominated by pots (159 pieces of 208 assessable fragments), followed by tripods (28), flanged bowls (12), jugs (5) and lids (3). Deeper bowl-like shapes are only represented by one

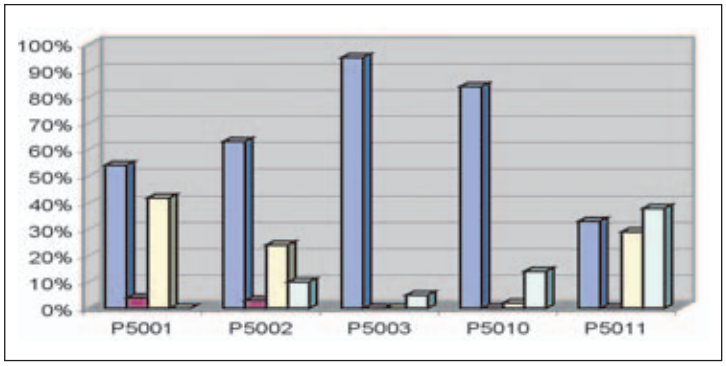

Fig. 20. Location of glaze (lower faecal layer). Blue – inner glaze; red – outer glaze; yellow – double-sided glaze; light green – unglazed.
Obr. 20. Umístění glazury (spodní fekální vrstva). Modrá – vnitřní glazura; červená – vnější glazura; žlutá – oboustranná glazura; světle zelená – režné.

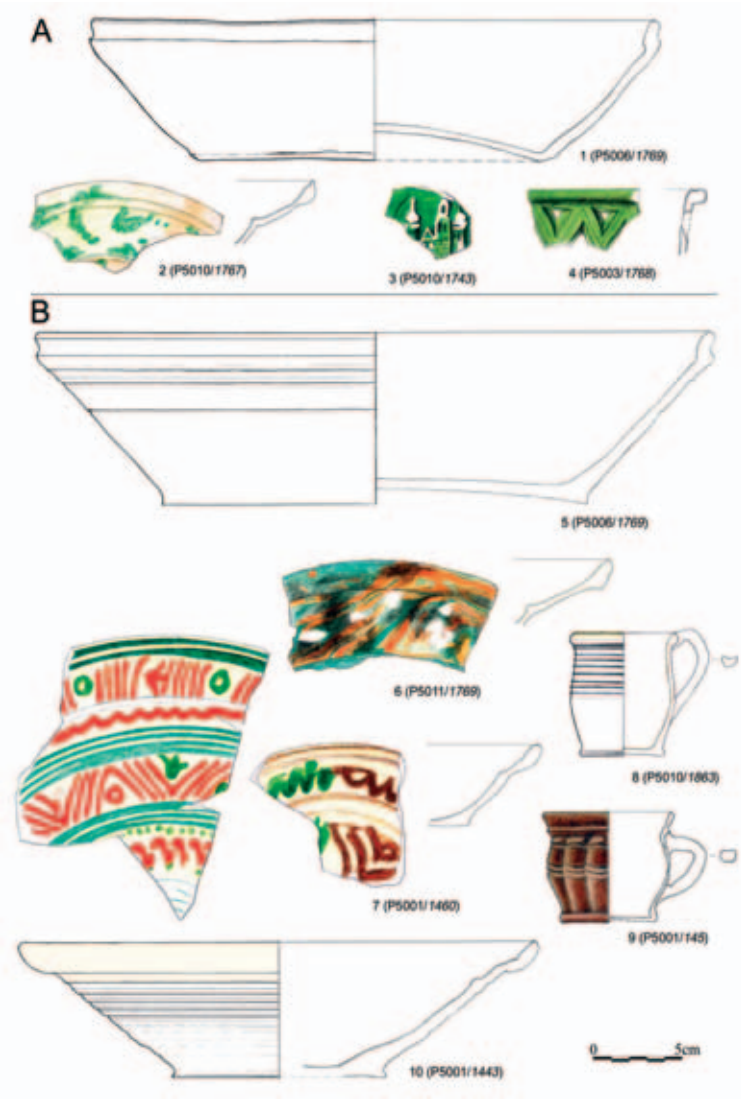

Fig. 21. Ceramics (A – upper rubble backfill; B – lower faecal infilling): bowls (1, 4, 5), flanged bowls (2, 6, 7, 10), cups (8, 9), fragment with embossed decoration from mould (3).
Obr. 21. Keramika (A – svrchní suťový zásyp; B – spodní fekální výplň): mísy (1, 4, 5), talířovité mísy (2, 6, 7, 10), hrnečky (8, 9), fragment s plastickou výzdobou z formičky (3).

fragment. Of a total of 4 assessable fragments in class P5011, the most frequent are bowl-like shapes (2 deep bowls, 1 bowl with high vertical handles).

A total of 173 measurable rims of pots were allocated to one of three size categories: small pots (diameter of up to 10 cm), medium-size pots (diameter of 10-20 cm) and large pots (diameter over 20 cm). We can place 15 pieces in the first category, 155 in the second, and only 3 in the large pots category. The medium-size category is dominated by rims with a diameter of 12-14 cm (total of 83 pieces).

Of the 26 measurable rims of tripods, 14 pieces have a diameter between 11 and 20 cm, 12 are in a size category with diameters between 22 and 26 cm. No large tripods (more than 30 cm) were noted.

Flanged bowls were found with diameters of 14 cm (4), 24 cm (1), 26 cm (1), 28 cm (1), 29 cm (1) and 31 cm (1).

Jugs were represented by rims with diameters of 8 cm (1), 9 cm (1), 10 cm (5), and 11 cm (2). Deep bowl-like shapes appear with diameters of 14, 15 and 36 cm (one example each). Lid diameters range between 10 and 16 cm (5).

5.2.1.3 Decoration

A total of 195 decorated fragments were noted in the collection (20 %). By far the most common method of decoration was by polishing (polishing the whole surface of a vessel or polished ornamental decoration), which is associated solely with reduction fired goods in classes P5005 and P5006 (approximately 42 % of decorated pieces). Painting with red clay on the unglazed outer side of a vessel (mostly a simple horizontal line) can be found on 38 pieces (19 %) and in most cases is associated with yellow inner glaze (34 pieces). Only in 4 cases were there pieces with inner brown glaze. This decoration appears only on pots in class P5010. There were also numerous examples of painting with clay, whether on a potsherd itself in combination with a clear transparent glaze (*fig. 21: 7, 10*), or on a white engobe in combination with a clear transparent glaze. Red, green, black and blue clays were documented. Dripped decoration into clear transparent glaze appears in 12 % of cases, in combination with white engobe in 11 % of cases. This type of decoration is dominated by dripped green glaze, but there are also blue, brown and orange glazes. Polychroming using brown, red and green pigment on white engobe only appears in 5 cases (about 3 % – *fig. 21: 6*). It is mostly decoration on the inside of open vessels (flanged bowls, deep bowls). No red engobe was noted.

Wheel-pressed decoration was noted in less than 1 % of cases (reduction fired goods in classes P5005 and P5006, and oxidation fired goods in classes P5002, P5003 and P5011). Of embossed decoration there is an embossed pressed moulding (only in 3 cases, only on brick-red oxidation fired goods in classes P5002 and P5011), and in one case the demanding technique of extruding a wall of a vessel from the inside into small moulds was documented (class P5001, in combination with outer deep green glaze).

5.2.1.4 Stoneware, majolica, porcelain

The only case where majolica can be considered is a fragment of a closed vessel (probably a jug) with stuck-on decoration from a mould. It is part of a lion's head inside a medallion framed by a plant wreath (coat-of-arms?). The motif is supplemented by a vertical band, showed off by engraving. Several such vertical lines presumably separated the various decorative areas of the jug. Brown and green transparent glazes were used on the fragment. The vertical band is most probably decorated with a yellow opaque tin-lead glaze[3)], so we believe it is majolica. Similar jugs come from Prague Castle, Jindřišská Street in Prague, and Orlí Street in Brno (see *Jordánková – Sedláčková 2005*, 136, colour supplement no. V/1-3, V/4, V/5).

Stoneware is represented by a single fragment of a jug or *Pinte* (mazer) with decoration in the form of stuck-on dark raspberry-like prunts (*fig. 22: 9*). The outer surface of the vessel oscillates between light grey, and orange and brown. This is probably a product of the Altenburg workshops (see *Horschik 1978*, 161-166).

A fragment of a porcelain bowl with cobalt blue vegetable decoration was a surprising find. This is very high-quality Chinese porcelain from imperial workshops dated to approximately 1575-1625[4)]. Chinese porcelain is very rare in the Czech lands in archaeological contexts. In addition to our find, we are only aware of another three cases where it has been unearthed: two in Prague Castle (*Frolík – Žegklitz – Boháčová 1988*; *Matiášek, in print*) and one, surprisingly, in Nymburk (*Sedláčková 1998*, 28).

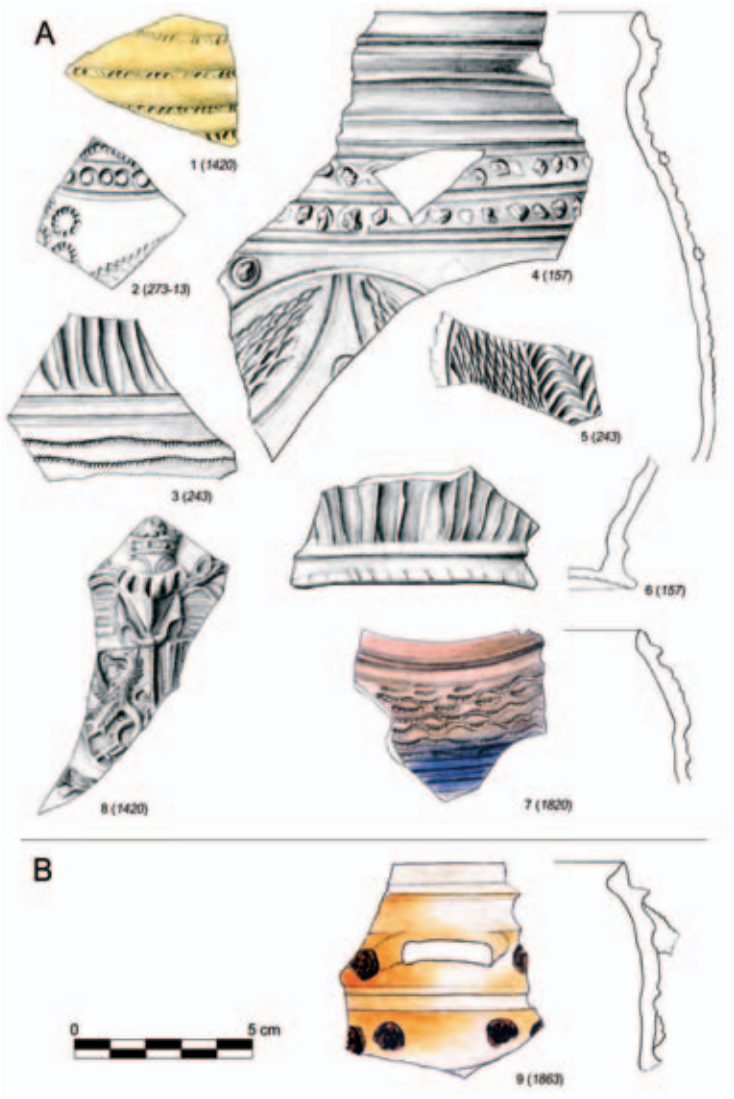

Fig. 22. Stoneware (A – upper rubble backfill; B – lower faecal infilling): Altenburg (1, 9), Muskau (2-6), Waldenburg (7), Cologne area (8).
Obr. 22. Kamenina (A – svrchní suťový zásyp; B – spodní fekální výplň): Altenburg (1, 9), Muskau (2-6), Waldenburg (7), oblast Kolína nad Rýnem (8).

5.2.2 Finds from the upper rubble backfill

A total of 1,880 ceramic fragments weighing 29,357 g were found in the rubble backfill.

5.2.2.1 Fragmentariness (*fig. 23*)

This layer is also dominated by larger fragments (the statistically most important categories are sizes 4-7), although, in comparison with the collection from lower faecal fill, we can say that there is a somewhat greater degree of fragmentariness in the ceramic material.

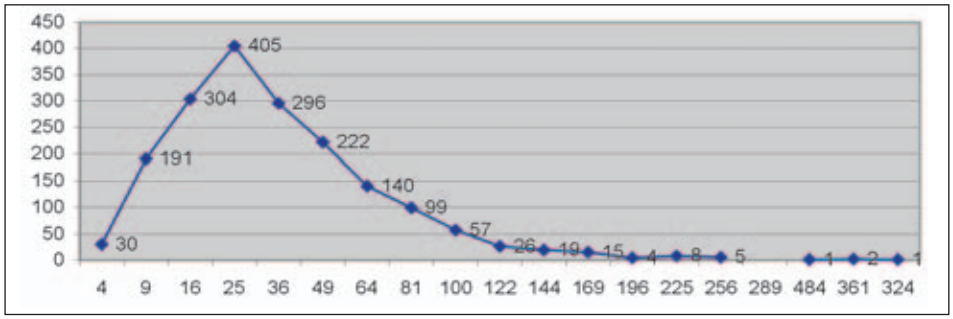

Fig. 23. Representation of size categories of fragments (upper rubble backfill). Horizontal axis – size of fragments in cm^2; vertical axis – number of fragments.
Obr. 23. Zastoupení velikostních kategorií fragmentů (svrchní suťový zásyp). Vodorovná osa – velikost fragmentů v cm^2; svislá osa – počet fragmentů.

Note 3:
V. Štajnochr, verbal communication.

Note 4:
Z. Černá and F. Suchomel, verbal communication.

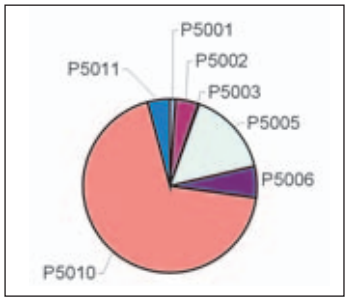

Fig. 24. Percentages of ceramic classes (upper rubble backfill).
Obr. 24. Procentuální zastoupení keramických tříd (svrchní suťový zásyp).

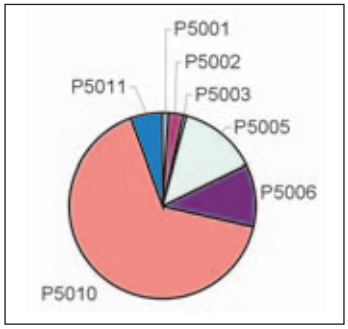

Fig. 25. Weight representation of ceramic classes (upper rubble backfill).
Obr. 25. Hmotnostní zastoupení keramických tříd (svrchní suťový zásyp).

5.2.2.2 Registered ceramic classes, morphology, typology (*figs. 24, 25*)

The ceramic classes P5001, P5002, P5003, P5005, P5006, P5010 and P5011 are represented in the collection. The most numerous class is that of oxidation fired goods, P5010 (68 % of the number and 66 % of the weight), followed by reduction fired goods from classes P5005 and P5006 (total of 21 % of the number and 14 % of the weight). Brick red oxidation fired goods from classes P5002 and P5011 is represented by 4 % of the number (3 % and 6 % of the weight). Class P5001, distinguishing itself by its fine white potsherd, amounts to only 1 % of the number and weight. Class P5003 is only slightly represented (less than 1 % of the number). Oxidation fired goods again dominate the collection (73 % of the number), but in comparison with the above mentioned collection there is a greater proportion of reduction fired ceramics.

92 % of oxidation fired goods are glazed fragments. Inner glaze was noted on 66 % of fragments, and double-sided glaze on 25 %, whereas only 1 % had outer glaze. The ratio between inner, outer and double-sided glaze in the various classes is shown in the graph (*fig. 26*), which makes it clear that, with the exception of class P5011, where unglazed goods are again the most frequent, inner glazes dominate all oxidation fired classes. The most frequent coloured glazes were yellow, brown and green.

Of a total of 311 morphologically identifiable fragments in the collection, the vast majority belongs to pots (76 %), followed by tripods/pans (9 %). Flanged bowls, and other bowl-like shapes, both amounted to 5 %. Other shapes are represented only slightly (fryer 2 %, jugs 2 %). There are very occasional finds of lids (2 pieces), a candlestick (1 piece), a vessel of an apparently basket-like shape and a "saltcellar". The collection is again markedly dominated by kitchen goods, and table ceramics is represented only by minority of finds.

Of a total of 15 morphologically determinable fragments in class P5001, nine of them are flanged bowls; there were also 3 jug and tripod pieces, and only 1 pot and 1 bowl. There were 18 identifiable fragments in class P5002, the most numerous being from pots (5 pieces), followed by tripods and jugs (4 pieces each) and flanged bowls (3 pieces). In class P5003 there were only 3 identifiable fragments: there were 2 pieces of pots and one fragment of a vessel with a basket-like shape (with cut-through walls, *fig. 21: 4*). Classes P5005 and P5006 are dominated by pots (37 pieces from a total of 55 fragments), there are 9 fryer fragments, and two fragments of a deep bowl with vertical handles. Other shapes are represented only by 1 fragment (conical bowl – *fig. 21: 1*, bowl, tripod, deep bowl). The most numerous class, P5010, is dominated by pots (267 pieces), followed by tripods (30 pieces), flanged bowls (6 pieces), deep bowls (4 pieces), lids (2 pieces) and a single fragment of a jug. There was a candlestick in this class (the sole representative in the whole set). Class P5011 contains bowls (9 pieces), pots (3 pieces), a flanged bowl (1 piece), a jug (1 piece), and a fryer (1 piece). There is a single fragment of a close-shaped vessel perforated at the top (a saltcellar?).

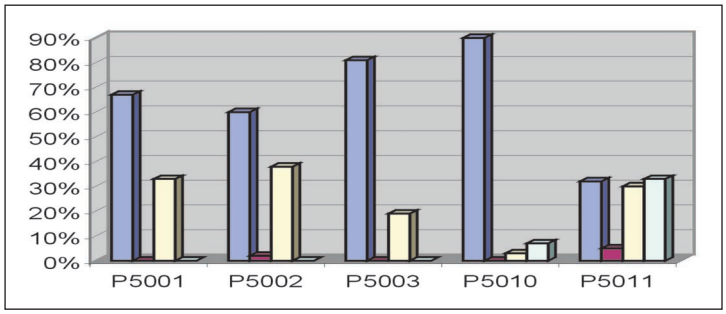

Fig. 26. Location of glaze (upper rubble backfill). Blue – inner glaze; red – outer glaze; yellow – double-sided glaze; light green – unglazed.
Obr. 26. Umístění glazury (svrchní suťový zásyp). Modrá – vnitřní glazura; červená – vnější glazura; žlutá – oboustranná glazura; světle zelená – režné.

A total of 250 measurable rims were again divided into three size categories. The first category (diameter of up to 10 cm) contains 10 specimens,

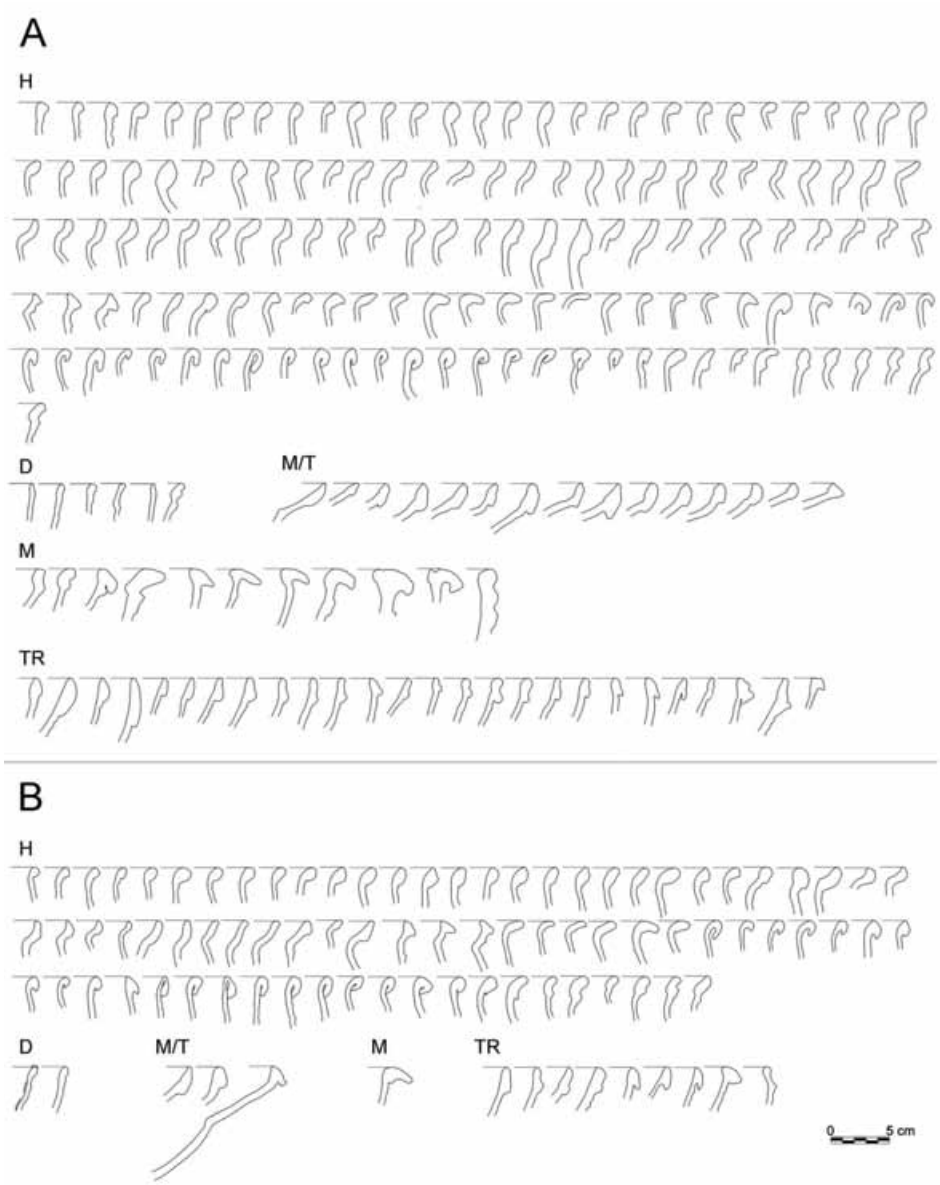

Fig. 27. Types of rims profiles of ceramic fragments (A – upper rubble backfill; B – lower faecal infilling): H – pots, D – jugs, M/T – flanged bowls, M – bowls, TR – tripods / pans.
Obr. 27. Typář okrajových profilací keramických fragmentů (A – svrchní suťový zásyp; B – spodní fekální výplň): H – hrnce, D – džbány, M/T – mísy s talířovitým podokrajím, M – mísy, TR – trojnožky / pánve.

the second (diameter of 10-20 cm) 228, and the third (diameter over 20 cm) 12 specimens. The second category (and the whole collection) was dominated by pots with rims ranging from 12 to 16 cm in diameter (163 pieces).

Of 35 measurable rims of tripods, one fragment had a diameter of only 9 cm, 19 fragments had diameters of 10-20 cm, and 7 fragments had diameters of 21-30 cm. Only one fragment did not even get into this category (diameter of 40 cm).

Flanged bowls were documented with diameters of 15 cm (1), 17 cm (1), 18 cm (1), 20 cm (1), 22 cm (2), 23 cm (1), 30 cm (4), 32 cm (2) and 34 cm (3). Other bowl-like shapes have diameters of 17 (1), 20 (1), 26 (4), 28 (5), 30 (2) and 32 cm (1).

Of six measurable rims of jugs, the most frequent were rims with a diameter of 9 cm (4 pieces); diameters of 10 cm and 12 cm was only found in the case of one exemplar each.

5.2.2.3 Decoration

The collection contains 416 decorated fragments (22 %). Quite the most frequent type of decoration was polishing (49 % of decorated fragments). This decoration was used solely on goods from classes P5005 and P5006. It is followed by painting with red clay under the neck of pots (one horizontal line, 16 %), again only on goods from class P5010. This decoration most frequently appears

in combination with yellow inner glaze (49 pieces of a total of 68), although there are examples of combinations with brown and green glazes and, in 6 cases, red clay appears on an unglazed potsherd. As in the previous collection, there is a relatively large group of pieces painted with clay, either on the potsherd itself or in combination with clear transparent glaze, or on white engobe in combination with clear transparent glaze (8 %). Red, green, black and blue clays were found. Dripped decoration into clear transparent glaze or into white engobe was only found in 2 % of cases. Dripped green glaze dominates in this type of decoration (*fig. 21: 2*), but blue, brown and orange glazes were also used. In contrast, polychroming with brown, red and green pigment on white engobe was relatively frequent (7 %), as was wheel-pressed decoration (also 7 %). An embossed moulding was noted in 7 cases, engraving on one fragment. More luxurious decoration in relief was found on 3 fragments (human head?, part of city architecture – *fig. 21: 3*).

5.2.2.4 Tiles

Only a few not-very-large fragments of chamber tiles with a simple smooth front side and profiled rims were found. A green transparent glaze had been applied.

5.2.2.5 Stoneware

The collection from the upper rubble backfill contained 22 fragments of stoneware. The production centres represented were Altenburg (wheel-pressed decoration – *fig. 22: 1*), Muskau (in one case decoration using chips of quartz – *fig. 22: 2-6*), Waldenburg (documented by the use of cobalt blue colouring – *fig. 22: 7*), and the Cologne area (jug with a partially preserved coat-of-arms – *fig. 22: 8*).

Fig. 28. Part of a woman's sheepskin shoe found in the lower cesspit contents. *Photo by J. Hlavatý.*
Obr. 28. Snímek části dámské boty ze skopovice nalezené ve spodní výplni jímky. *Foto J. Hlavatý.*

5.3 Leather products

Leather fragments were found in the lower pit infilling. Two of the fragments could be identified: the first from the instep part of a lady's sheepskin shoe (*Orlita 2005*, 1) decorated with a silver colour and a line relief in the form of a diamond (*fig. 28*), the second, similar, from finer leather used in a child's shoe. Another small triangle-shaped fragment with the remains of gold colour on one side may have been from a lady's handbag or purse.

6. Conclusion

With today's knowledge about the cesspit's contents it is possible – outside the scope of this article – to express doubts about the correctness of the method of fieldwork, when part of the cesspit's contents under the water level was excavated by a bulldozer and most of it was not analysed archaeologically. The necessity of increased costs and insufficient time for decision-making turned out to be the most important elements in considerations, and the lower section remained uninvestigated. All decisions should be viewed in the context of the time they were made, and at that time the priority was the detailed disassembling of the early medieval parts of the site. Nevertheless, this is an interesting contribution to the discussion about the strategy for performing archaeological excavations.

Assessing the totality of finds from the cesspit is not without problems. One of them is clear from the above description of the field situation. We are not yet able to reliably determine the location of the various lots of the burghers'

houses, as they were built on the ruins of the medieval convent in the first half of the 16th century. In the middle of this century the district of the former convent was first called a jurisdiction, which comprised 5 to 6 houses at various times. The location of their lots, however, cannot be determined with certainty without further detailed research (*Pavlík –Lancinger – Líbal – Rulc 1965*, 9 nn.). Even it is impossible to rule out the possibility that the cesspit site was built up with temporary houses erected by the Dominicans (who arrived in Malá Strana in 1604) that had to be demolished when work on the large church began (*Pavlík – Lancinger – Líbal – Rulc 1965*, 18).

Any assessment currently relies on just the finds themselves. Some of them, in particular fragments of luxury glassware, as well as Chinese porcelain and stoneware, give the impression that higher social classes were present at the location. Regardless of the fact that making such a direct connection can often by deceptive, the biggest problem is the lack of published comparative material. The main aim of the relatively detailed publication of well-dated finds from the cesspit dated to the first half of the 17th century is therefore to at least contribute to the partial alleviation of this problem.

Resumé:

Presentovaná odpadní jímka byla odkryta při záchranném archeologickém výzkumu (2003-2006) domovního bloku v jižní části pražské Malé Strany. Výzkum, který byl vyvolán přestavbou bývalého barokního dominikánského kláštera na hotel, provedlo archeologické oddělení Národního památkového ústavu v Praze.

Jímka byla objevena v severozápadní části dnešního dvora, v zadní (východní) partii městiště domu postaveného na troskách středověkého kláštera magdalenitek v pohusitské době. Na přední, západní části městiště byl od roku 1656 stavěn kostel dominikánského kláštera. Jímka nebyla vystavěna ve volném prostoru, její půdorys byl dodatečně vložen do vytápěcí komory středověké pece. Ta byla zahloubena více než 2 m do tehdejšího terénu, po změně funkce byla prostora prohloubena o dalších 2,5 m a její obvodové stěny byly podezděny. V úrovni základové spáry podezdění byly nalezeny dubové trámy, jejichž věnec vymezoval čtvercový obvod jímky o vnitřní straně dlouhé 2 m. Dendrochronologická analýza ukázala, že dub, ze kterého trám pocházel, byl poražen na přelomu let 1609 a 1610 (*Kyncl 2004*). Severozápadní roh jímky byl porušen blokem zdiva základové partie pilíře, z něhož vybíhal pas nesoucí obvodové zdivo západní části barokního ambitu. Funkce jímky skončila v době, kdy dominikáni po vykoupení jednotlivých domů při Karmelitské ulici přikročili k jejich demolici a začali stavět svůj nový klášterní kostel a následně klášter.

Výplň jímky bylo možné rozdělit do dvou základních horizontů. Svrchní byl tvořen souvrstvím suťových zásypů vzniklých víceméně jednorázově, spodní část výplně jímky byla zaplněna typickou fekální výplní. Tvořilo ji souvrství hnědých a tmavě hnědých měkkých hlín s velmi hojnou příměsí organiky.

Z jímky byly získány poměrně početné nálezy, především skla a keramiky, jejichž rozbor tvoří vlastní část článku. Nálezy z obou horizontů jsou zpracovány zvlášť, a i když podrobné srovnání zatím nebylo provedeno, zdá se, že mezi nini nebudou větší rozdíly. Mezi nálezy z dutého skla zaujímá naprosto dominantní postavení stolní sklo. Statisticky nejvýznamnější skupinu tvoří poháry. Mezi číšemi vyniká luxusní válcovitá číše zdobená emailovou malbou či fragment číše typu berkemeier.

Pro analýzu keramiky byl použit deskriptivní systém navržený pro pražskou novověkou keramiku P. Vařekou. Souboru výrazně dominuje kuchyňské zboží, stolní keramika je zastoupena minimálně. Mezi výjimečné nálezy patří fragment majoliky, úlomky kameniny či naprosto ojedinělý úlomek čínského porcelánu.

Při hodnocení nálezového celku jímky se setkáváme s řadou problémů. Mezi základní patří skutečnost, že zatím z písemných pramenů nejsme schopni určit majitele městiště, ze kterého nález pochází. Dalším problémem je fakt, že nemáme možnost srovnat charakteristické prvky našeho souboru s podobným materiálem z městského profánního prostředí.

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Environmental analyses of the content of a Renaissance cesspit from Malá Strana in Prague

Environmentální analýzy obsahu renesanční jímky z Malé Strany

Naturwissenschaftliche Analysen der Verfüllung einer Renaissance-Grube auf der Prager Kleinseite

Petr Kočár – Zdeňka Sůvová – Romana Kočárová – Tomáš Kyncl

Der vorliegende Text liefert Informationen über die durchgeführten naturwissenschaftliche Analysen der Verfüllung einer Abfallgrube auf der Prager Kleinseite. Durchgeführt wurden Untersuchungen der Tierknochen und pflanzlichen Makroreste, bestimmt wurden Hölzer und Holzkohle. Dendrochronologisch wurde die Entstehung der Grube in das Jahr 1609, ihr Ende ins Jahr 1654 datiert. Osteologisch bestimmt wurden sowohl gesammelte als auch geschlemmte Knochen. Es überwogen Knochen von Haussäugern (Rind und Schaf/Ziege), Hausschwein ist keines belegt, andererseits wurden Überreste von Jagdwild gefunden (Wildschwein und Hirsch). Daneben auch Geflügel (Gänse) und kleinwüchsige Hunde. Relativ reich waren die Funde in den geschlemmten Proben – wichtig sind Fischgreten (bis zu 8 Arten). Das archäobotanische Material zeichnet sich durch die Anwesenheit von importierten Nutzpflanzen aus: Reis (Oryza sativa), *Schwarzer Pfeffer* (Piper nigrum) *und der im Mittelalter übliche Feigenbaum* (Ficus carica). *Aus der Neuen Welt stammt z. B. der Speisekürbis* (Cucurbita maxima), *in diesem Fall dürfte es sich um den ältesten veröffentlichten Fund dieser Art in Europa handeln.*

Introduction

During extensive archaeological excavation taking place in the years 2003-2006, a walled cesspit was uncovered and partially excavated in the southern part of Malá Strana (Lesser Quarter) in Prague. The origin of this structure was dendrochronologically dated to 1609. From the settlement situation and written sources of this period, it can be taken that the cesspit stopped fulfilling its function in 1654. The structure evidently lay in a standard burgher plot. (The history, excavation results and settlement context are described in the contribution to this volume by Š. Rückl, J. Havrda and M. Tryml).

The cesspit fill comprised in its upper section rubble stemming from building demolition. The lower section comprised a thick (c. 250 cm) organic faecal / waste fill. Due to the high water level, only the upper part of this organic fill could be excavated archaeologically. The studied ecofacts can probably be dated to the second half of the 17th century.

Materials and methods

A single sample of the organic fill with a total volume of 40 litres was withdrawn from layer B10-003 for environmental analysis; osteological material was also obtained through standard excavation. The removed sediment was floated through a set of sieves (with smallest mesh diameter of 0.4 mm), and dried at room temperature.

Flotation yielded three heavy fraction sizes (>2 mm, 1-2 mm and 0.4-1 mm), as well as the light fraction. Plant macro-remains and microfauna bones were gained from all of these fractions, where fraction above 1 mm was sorted in its entirety. Ten percent of the smaller fraction (0.4-1 mm) and floating fraction was sorted. Plant and faunal remains were selected and classified using a stereoscopic microscope.

The carpological palaeobotanical material gained (seeds and plant fruits) were identified through the use of the comparative plant collection of ZIP o. p. s. in Plzeň. Basic literature for plant macro-remains determination was also employed (*Anderberg 1991*; *Beijerinck 1947*; *Berggren 1969*; *1981*; *Bertsch 1941*; *Katz et al. 1965*; *Schermann 1967*), along with literature relating to particular, critical plant groups (*Körber-Grohne 1964*; *Klán 1947*). Varieties of the *Prunus* family (which includes greengages, plums, cherries, blackthorn and sour cherries) were determined on the basis of the comparative collection and the work of *Kühn* (*1991*). Seeds of the *Cucumis* family (cucumbers, watermelons) were determined on the basis of the cross-section of the seedcase. The botanical nomenclature, with the exception of the *Prunus* family, followed the publication *Klíč k úplné květeně České republiky* (*Kubát 2002*).

Wood fragments were studied by sectioning with a razorblade (transverse, radial and tangential cuts), and were subsequently studied directly beneath an optical microscope set up for observation under incident light at 50x, 100x and 200x magnification. Pieces of charcoal were examined similarly on freshly broken surfaces. The wood and charcoal were determined with the aid of the comparative collections of wood and charcoal possessed by ZIP o. p. s. Plzeň. Further, literature on the determination of wood and carbon was employed (*Schweingruber 1978*), as well as an Internet key to the identification of the wood and carbon of Central European trees (*Schoch – Heller – Schweingruber – Kienast c. 2004*; *Schweingruber et al. c2005*).

Some of the material for osteological analysis was obtained through standard excavation (i. e. through the hand collecting from particular layers), while the rest was obtained by flotation (see above). The bones gained by the latter method were evaluated separately to those obtained through hand-collection. This was necessary because of the need to preserve comparability between different sites, as well as due to methodological reasons (fraction below 1 mm was not sorted in its entirety). In the text that follows, where numbers and ratios of bones are given, these data refer to the material gained through standard excavation. To establish the quantities of particular taxonomic units, both the number of fragments and minimum number of individuals (or MNI) were used (the quantification method is detailed in *Kyselý 2004*). The data obtained regarding species, age and anatomical position, as well as dimensions and other information, were entered into a database.

A cross cut was made for dendrochronological dating purposes from the oak foundation beam of the cesspit. The actual dendrochronological evaluation was undertaken using the standard methodology (*Kyncl 2005*). The sample surface was prepared with the aid of a razor blade, and the edges of the growth rings were highlighted by chalking. The width of the growth rings was measured on two measuring tracks on Timetable equipment; the growth ring curves obtained were subsequently analysed using PAST32 software (*Knibbe 2003*). Initially the curves from the two independent measurements were synchronised, to obtain a 259 year long relative series, which was then compared to the standard oak chronology for Bohemia[1)].

Note 1:
The standard cechges2004 chronology has been established for the period 974-1998 AD.

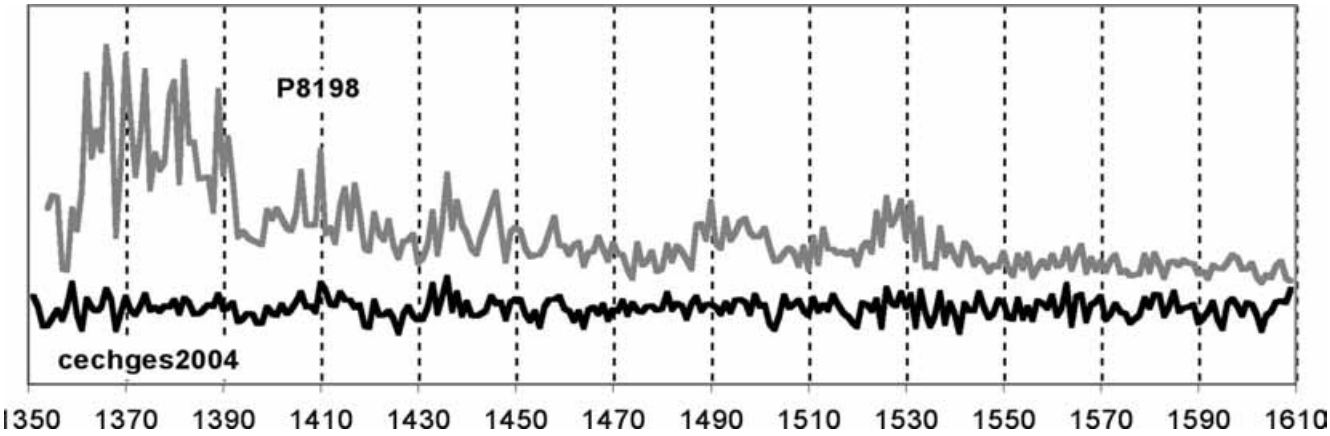
Results and discussion

Dendrochronological analysis

Dendrochronological analysis yielded a 259 year long relative tree ring series. A single statistically conclusive synchronous position was found (*graph 1*), dating the last growth ring to 1609.[2)] Given that the last surviving growth ring on the beam was also completed comprised of a sub-bark layer, it can be stated that this tree was felled in the period between the end of the growth season in 1609 (roughly October), and the beginning of the growth season in 1610 (around April).

The noticeably great age of the tree used (over 259 years) is noteworthy. Such old trees appear in constructions only exceptionally, and as a rule these are buildings of the earlier period. A comparable age (over 320 years) was for example found for an oak used in the ceiling structure of the palace at Bezděz Castle.

Note 2:
The degree of similarity was calculated in the standard manner through t-tests of the correlation coefficient after transformation with the aid of the five-year moving average (tBP – *Baillie – Pilcher 1973*), and after Hollstein transformation (tHO – *Hollstein 1980*). The resulting values (tBP = 13.17; tHO = 12.95) are demonstrable at a significance of p = 0.001.



Graph 1. Comparison of the summer growth ring curves for the foundation beam in the cesspit (P8198) and the standard oak chronology for Bohemia (cechges2004).
Graf 1. Porovnání letokruhové křivky základového trámu jímky (P8198) se standardní chronologií dubu pro Čechy (cechges2004).

Macro-remains analysis

The evaluated assemblage of plant macro-remains comprised around 3000 pieces representing about 80 plant taxa (*tab. 1*). The concentration of plant remains was 406 determinable fragments (mainly seeds and fruits) per litre of unflotated sediment. Layer B10-003 was found to be comparatively rich in species. The plant remains were well preserved, so in most instances they could be determined down to species; only in a small percentage was it possible to determine only to higher taxonomical units (genus, family). The botanic material is, therefore, well appraisable, and comparable to that from similar contexts.

Among the numerous taxa were cherry (*Cerasus avium*), sour cherry (*Cerasus vulgaris*), strawberry (*Fragaria vesca/viridis*), apple/pear (*Malus/Pyrus*), poppy (*Papaver somniferum*), blackthorn (*Prunus spinosa*), blackberry/raspberry (*Rubus ssp.*) and grapevine (*Vitis vinifera*). The group of most numerous species comprised in particular productive taxa with large numbers of small diaspores, which pass easily through the human digestive tract (an indication of the faecal nature of the well fill), as well as those taxa with fruit processed in households into better storable fruit conserves (marmalades, jams) or alcoholic drinks (fruit wines, distilled products). Among the wild species there is a predominance of common ruderal species (*Chenopodium album*, *Aegopodium podagraria*) in particular.

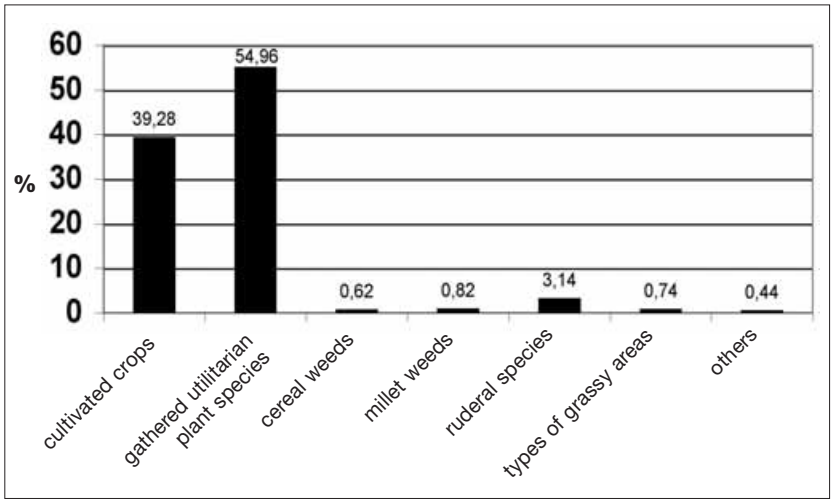
The taxa identified through the archaeobotanical investigation of the well represent a diverse plant community, and with this different habitats.

The classification of particular plant species determined through research into environmental groups is undertaken on the basis of recent parallels from the Czech Republic, with consideration given to the specific conditions governing the vegetation of Prague. Such a division into relatively broad ecological groups is not definitive and unchanging, as a whole series of species might grow under various environmental conditions, and therefore in different plant communities. Given all of the foregoing, the species were divided into six basic groups, which can be further divided into next several groups:

- utility plants (cultivated and collected),
- crop weeds (cereal weeds and true millet weeds),
- ruderal vegetation,
- meadow and pasture species,
- wetland species,
- others (e. g. woodland species and shrub formation), where these were primarily classified into groups according to their practical significance[3)].

Note 3:
Any taxon both gathered as productive and from a brush formation was classified into the 'productive plants' category.

The proportions of macro-remains of the taxa in these groups were then assessed in the samples obtained (*graph 2*). The diaspores of the collected, productive species were present most commonly (around 55 %), followed by those of the cultivated plants (around 40 % of the investigated diaspore assemblage). The remaining groups formed only a small part of the assemblage as a whole; the macro-remains of local ruderal vegetation made up just 3 % of the assemblage, while the cereal weeds, millet weeds and meadow species made up no more than 1 %.



Graph 2. Percentages of particular ecological plant groups in the studied assemblage of plant macro-remains (n = 3032).
Graf 2. Procentuální podíl jednotlivých ekologických skupin rostlin ve studovaném souboru rostlinných makrozbytků (n = 3032).

Productive plant species

Productive species were the dominant element in the plant macro-remain assemblage. A clear majority of the dominant species fall within this group. This is a result of the specific taphonomic conditions in the studied feature, and in particular its waste character.

Forty productive plant species were identified, and these could further be subdivided into cereals, cultivated and collected fruit species, imports, oleaginous and fibre-yielding plants, herbs/medicinal plants and vegetables. One significant group of productive plants that was not to be found was that of pulses/legumes.

Cereal macro-remains were generally represented only poorly. As in High Medieval cesspits, here also millet predominated among the cereal macro-remains. It is presumed that the reason behind this repeated phenomenon lies in the taphonomic conditions. The dominant position of this species in High Medieval and Early Modern waste pits is probably due to the fact that millet was processed in the household itself. Equally, unlike other cereal products, millet cannot be stored for a long period of time, as it easily turns sour (the fats within the grain become rancid). Its fluid movement to households was ensured not by the purchase of millet, but by its storage and pulping within the household. Husks, a waste product arising out of this process, then ended up in the midden.

The other cereals identified (oats, rye) were present only peripherally, in particular in a mineralised state. These species, unlike millet, are at a taphonomic disadvantage – they were usually prepared outside the urban household in mills, and their preservation is substantially less likely.

A fragment of buckwheat achene was also found.

The macro-remains of oleaginous and technical (fibre-yielding) species were also represented only weakly. Poppy seeds and hemp achenia were identified. Diaspore finds of these species are evidence for the consumption of these diaspores in foodstuffs of various kinds. While poppy is still commonly eaten in Central Europe today, hemp achenia (hemp-seed) is rarely found in the diet today. In the Early Modern period, however, it was fairly common in the form of a seed mash and soups.

The range of herbs present (coriander, cumin, juniper) indicates the abundant consumption of meat; dill achenia were also found. As in High Medieval pits, here hop achenia were also recovered.

Vegetable finds are represented in particular by cucumber seeds; the find of a single diaspore of xerophilic honeydew melon may be regarded as unusual. The find of winter squash (*Cucurbita maxima*), however, was extraordinary. This is probably the first published find of its type in Europe; hitherto, this species has been found in the framework of a secondary area of occurrence only at one location, at Bosra in Syria (*Willcox – Roitel 2003*). From this country, the only similar finds known to date are of summer squash (also known as field pumpkin; *Cucurbita pepo*) from Early Modern pits in Prague – at Chodov, Petrská Street and Republic Square, Ivančice and Český Krumlov (*Holý 1973*; *Opravil 1978*; *1985*; Kočár – unpublished data). A list of known European sites at which this related species was found is provided in *table 2*. Several of these Old World finds can be dated to the first half of the 16th century; squashes were thus among the first produce to spread from the New World to Europe.

The assortment of identified fruit matches the Early Medieval standard. The commonly cultivated species of common apple and common pear were found, as well as the relatively xerophilic species of peach, walnut, black mulberry, grapevine and medlar. Medlar had previously been known only from a small number of High Medieval sites in Most (*Čulíková 1985*) and Prague (Podolská, unpublished data). The range of cultivated stoned fruits was fairly broad, taking in several varieties of greengage, plum and cherry (hard cherry, heart cherry and sour cherry). The identified greengages matched the High Medieval types. By contrast, the find of true plum and very progressive cherry types marks the beginning of the Modern transformation of fruit growing.

The assortment of gathered fruit was also wide. Regularly recorded species were found – bird cherry, European hazel, strawberry, blackberry, bramble, raspberry, cowberry, bilberry, blackthorn and dogwood/cornel, typical of the warmer parts of this country.

The use of medicinal plants in the Early Modern period remains an interesting, and hitherto little discussed, question. This macro-remain assemblage included the identified diaspores of European elder, woody nightshade, Midland hawthorn, rose and guelder rose. The rose diaspores in particular were predominant; their quantities indicate that they may also have been used for flavouring some kind of marmalade or preserve. Midland hawthorn and guelder rose are species which do not commonly occur in local ruderal vegetation communities, and must therefore have entered the assemblage through some kind of human intervention. The quantities of woody nightshade diaspores and perhaps of European elder, when taken

together with the closed character of the investigated situation (into which local vegetation diaspores entered only in limited numbers), indicate their intentional use. Several other species remained uncertain in terms of their contemporary utilitarian significance (black nightshade, danewort/dwarf elder).

Most interesting, perhaps, is the group of identified imported fruits. In addition to fig, common in the High Middle Ages too, seeds of the black pepper plant and grains of rice were found.

Black pepper (*Piper nigrum*) is native to western India. Pepper is known from the Early Modern period at Uherský Brod (*Opravil 1974*) and Bratislava (*Hajnalová 1985*). In western Europe, medieval and especially Early Modern finds are disproportionately more abundant; in Germany, for instance, this species is known from Bremen (*Behre 1991*), Mölln (*Wiethold 1992*), Kiel (*Wiethold – Schulz 1991; Wiethold 1995*), Köln/Cologne (*Knörzer 1987*) and Konstanz (*Küster 1989*), and in Great Britain from Tauton (*Greig 1988*). Pepper appears on the market in two forms: black pepper comprises dried, immature baccate fruits, while white pepper is supplied in its fully mature form, with the fleshy pericarp removed from the fruit during the fermentation process. The seeds found here were missing the pericarp, and differed in this way from the Uherský Brod finds, where entire, monospermous fruits were found with the characteristic wrinkled surface (*Opravil 1974*). It is not of course possible to say with certainty that the soft parts of the fruit were not removed during the process of preparing the sample, or in the course of its archaeologisation.

Rice (*Oryza sativa*) was evidently not unknown in Bohemia during the High Middle Ages, and is for example mentioned in the Herbal of Křišťan of Prachatice, which originated around 1400 (oldest known copy: 1416 – *Čížek 1994*). Nevertheless, it became commonplace only in the Early Modern period. Rice grains have been identified in this country only in two cases: an Early Modern find from Opava – Jaktařská brána (*Opravil 1986*), dated to the 17th-18th century, and from Prague – Kanovnická Street no. 73 (*Čulíková 1995*), dated to the 16th-17th century. Although the origins of rice must be sought in South-East Asia, in the Early Middle Ages it was already being shipped from the Mediterranean, where its cultivation was becoming widespread. Interesting evidence for the origin of Mediterranean rice and its shipment to western Europe has been afforded by archaeological excavations in the Jewish Quarter of Amsterdam (*Paap 1983*), where the archaeobotanical assemblage contained rice along with ricefield bulrush (*Scirpus mucronatus*), a paddy weed characteristic of the Mediterranean milieu. A more detailed outline of the history of the spread of rice has been provided by *Opravil* (*1986*).

Wild plants and their environmental interpretation

Wild plants form a minority in the investigated feature; the character of the investigated situation does not enable a more detailed description of the local ruderal vegetation, and only characterises the wild vegetation in the hinterland of the site of interest peripherally. In all, some 57 wild species were identified.

Woodland species are represented only marginally in the assemblage, in particular by finds of needles from conifers used as building wood or in craftsmanship – specifically silver fir (*Abies alba*) and Norway spruce (*Picea abies*). Wild bird cherry was also found (*Cerasus avium* var. *avium*), which colonises light oak woods, and forest locations secondarily lightened by man.

The consumption of the fruit of bilberry (*Vaccinium myrtillus*) resulted in the relatively abundant presence of this species of acidic forest soils. Also conspicuous are species of the forest mantle, clearings and brush: hazel (*Corylus avellana*), hawthorn (*Crataegus laevigata*), blackthorn (*Prunus spinosa*) and wild rose (*Rosa* sp.). A markedly synanthropic character was exhibited by the brambles (*Rubus cesius,* less commonly *R. fruticosus* and *R. idaeus*) and elders (*Sambucus nigra*, *S. ebulus*). It is rather damp brush and lighter water meadows that are settled by guelder rose (cranberry; *Viburnum opulus*) and woody nightshade (*Solanum dulcamara*). Xerophilic oak woods and brush formations are settled by dogwood/cornel (*Cornus mas*).

Peripheral and nitrophilic communities from near water and shady locations influenced by human activity are settled by species such as ground elder/bishop's weed (*Aegopodium podagraria*), common hemp-nettle (*Galeopsis tetrahit*), cleavers/goosegrass (*Galium aparine*) and common hop (*Humulus lupulus*).

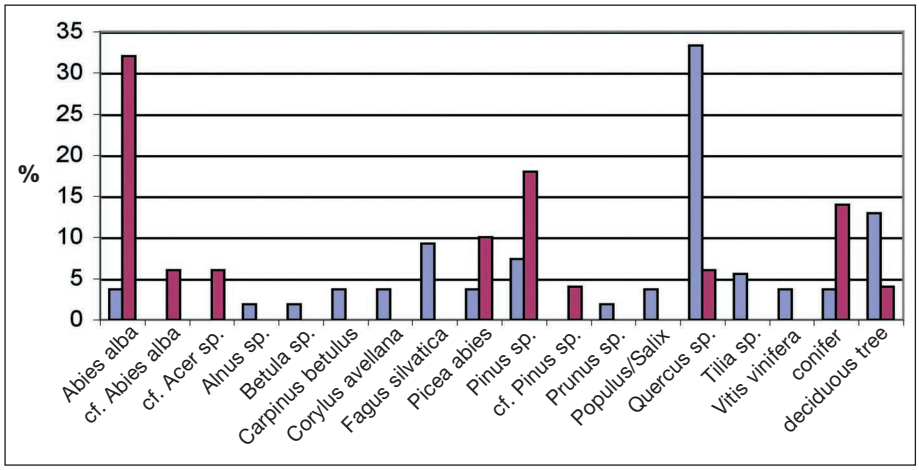
The list of field weed species is relatively long. An obvious group of these comprises those potential weeds of millet fields: barnyard grass (*Echinochloa crus*-gall)i, false cleavers (*Galium spurium*), ball mustard (*Neslia paniculata*), yellow foxtail (*Setaria pumila*) and green/hooked bristlegrass (*Setaria viridis/verticillata*). Small/carrot bur parsley (*Caucalis lappula*) is an obvious xerophilic species, which colonises basic soils, especially on loess. The typical cereal weeds present include in particular common corncockle (*Agrostemma githago*), cornflower (*Centaure cyanus*), and less clearly – as they extend into other communities – black-bindweed (*Fallopia convolvulus*), *Myosotis* sp., *Papaver* sp., wild radish (*Raphanus raphanistrum*) and charlock mustard (*Sinapis arvensis*).

Species of loosened soils in ruderal areas were also recorded. It is indeed from this group that the likely representatives of local vegetation, bearing scant information about the situation at the investigated site or in its immediate environs, come. Typical among these are slightly nitrophilic species of disturbed soils: *Brassica* sp., lambsquarters (*Chenopodium album*), pale smartweed/pale persicaria (*Persicaria lapathifolia*), black nightshade (*Solanum nigrum*) and field pennycress (*Thlaspi arvense*). Many species of this group, however, also have a tendency to colonise elsewhere, e. g. in segetal communities. Oval-leaf knotweed (*Polygonum arenastrum*) is a typical indicator of areas that are lines of communication.

Grassy communities were represented only by a small number of species. Only a single representative of wet meadowlands was found: *Carex* sp. Pastures and short-stalk meadows were represented by the seeds of carraway (*Carum carvi*), strawberry (*Fragaria vesca/viridis*), *Potentilla* sp. and juniper (*Juniperus communis*). Mesophilic, slightly ruderalised grassy communities are indicated by the species oxeye daisy (*Leucanthemum vulgare*), meadow buttercup (*Ranunculus acer*), bladder campion/maidenstears (*Silene vulgaris*), grasslike starwort (*Stellaria graminea*) and red clover/cowgrass (*Trifolium pratense*).

Wood and charcoal analyses

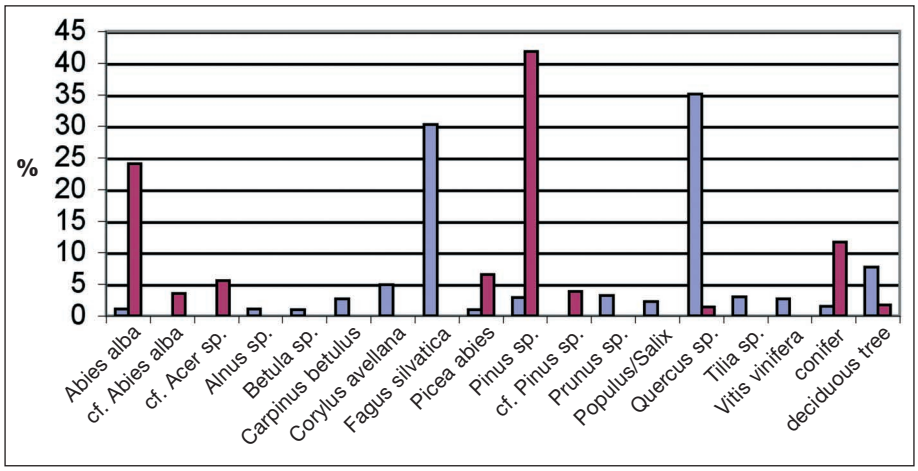
Xylotomic analysis determined a relatively wide range of 14 wood species. The main utility species found were fir (*Abies*), spruce (*Picea*), oak (*Quercus*) and pine (*Pinus*), all of which occurred both charred and as wood proper. Another economically useful wood appearing was beech (*Fagus*), present only as charcoal. Also present only in charcoal form were alder (*Alnus*), birch (*Betula*), hornbeam (*Carpinus*), hazel (*Corylus*), plum (*Prunus*), polar/willow (*Populus/Salix*), lime (*Tilia*) and grapevine (*Vitis vinifera*). Maple (cf. *Acer*) was found only as uncarbonised wood.



Graph 3. Percentages of wood and charcoal fragments in the studied fragment assemblage, in terms of number (n = 104). Blue – charcoal, purple – wood.
Graf 3. Procentuální zastoupení fragmentů dřev a uhlíků ve studovaném souboru zlomků, početní zastoupení (n = 104). Modrá – uhlíky, fialová – dřeva.

In non-carbonised form, there was a preponderance of needle-leaved trees (fir, spruce and pine), while in carbonised form there was a preponderance of deciduous trees (oak and beech). In the case of the coniferous trees this state is interpreted as being a consequence of their use in building work, the manufacture of shingles and chopping of planks, or in various crafts that could be practised at household. The hard deciduous trees were used to a greater extent as fuel. Their use in construction, however, is shown by the dendrochronological analysis of the oak foundation elements of the cesspit. This is an example of the use of oak wood being used in structural elements designed to resist the wet.

If the numbers and masses of the individual woody species represented are considered, it is apparent that the relationship in the appearance of the woods differs (see graphs 3, 4). In terms of numbers, oak and fir predominate (both accounting for over 30 % of the assemblage), while oak appears in particular in the form of charcoal, and fir in the form of uncarbonised wood. When considering the representation of the individual wood species by mass, a great growth is seen in the proportion of pine (around 40 %) and beech charcoal (around 30 %). The proportion of oak remains more or less unchanged, while that of fir declines somewhat. Beech and pine therefore appear in the form of carbon fragments in particular.



Graph 4. Percentages of wood and charcoal fragments in the studied fragment assemblage, in terms of mass (total = 17.17 g). Blue – charcoal, purple – wood.
Graf 4. Procentuální zastoupení fragmentů dřev a uhlíků ve studovaném souboru zlomků, hmotnostní zastoupení (celkem = 17,17 g). Modrá – uhlíky, fialová – dřeva.

It is the archaeologist's view that the representation by mass, given the fragility of the study material, better expresses the actual relationships between the various woods.

A separate commentary is required for the finds of two grapevine (*Vitis vinifera*) charcoals. This species is relatively commonly documented in the form of carbonised, uncarbonised or mineralised stones. Finds of these macro-remains cannot confirm the origins of the fruit consumed (the possibility of fresh fruit, raisins etc. being transported). By contrast, a wood find can be interpreted as an indicator of the local origin of cultivated vines.

Osteological analysis

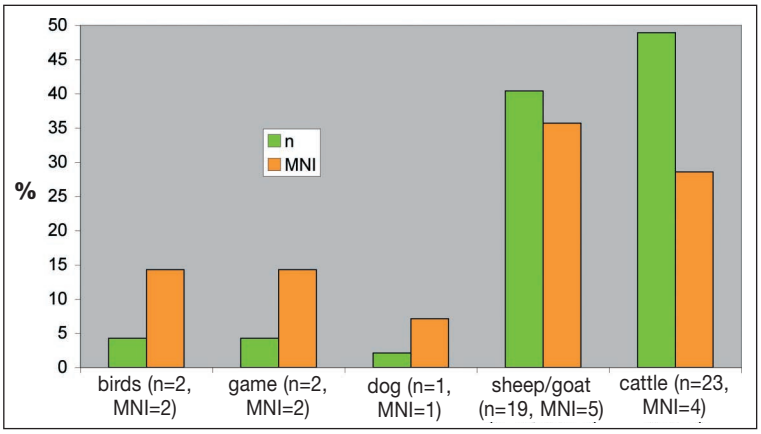
Osteological finds from the cesspit excavation comprised a relatively small sample in terms of numbers, but the assemblage nevertheless displays some interesting aspects. A total of 94 bones were analysed, of which half could be determined with confidence (see *tab. 3*). Among these, there was a dominance of cattle and the mixed sheep / goat taxon (see *graph 5*). The cattle bones, the most

numerous finds by number (49% of the identified fragments), represent at least 4 individuals, of which 2 were adult and 2 were non-adult (on the basis of the state of dentition ages were estimated at 5-6 months and 15-18 months). In terms of size, these cattle were middling to large (although of course no whole bones were recovered from which height at the shoulder could be calculated), this reflecting the period framework well.

The mixed sheep/goat taxon forms a relatively high proportion of the assemblage (38%); in addition, another bone could be classified as sheep (goat was not found). The sheep/goat bones come from a minimum of 5 individuals, of which 4 were adults and 1 was a sub-adult (less than 3 and a half years).

It is interesting that the assemblage lacks finds of domestic pig, which has been one of the most numerous finds at European archaeological sites from the Bronze Age (*Roblíčková 2003*) to the present day. To draw a more general conclusion would however require a more representative assemblage (something that is true not just in this case).

Given the absence of bones from domestic pig, it interesting that a single wild boar bone and single red deer bone were found. The boar was a non-adult individual (apparently around 2 years old); on the basis of the maximum metatarsal length, the deer is estimated to have stood 123 cm high at the shoulder (it was probably a buck). Finds of bones from wild animals are generally taken to be an indicator of the higher social status of the inhabitants of the investigated site.



Graph 5. Percentages of particular faunal taxa (hand-collecting – number of bones, MNI).
Graf 5. Relativní zastoupení jednotlivých živočišných taxonů (ruční výběr – počet kostí, MNI).

Other species determined from single bones were domestic dog, a gallid bird, and goose. The skull of an adult dog indicates a smaller breed (smaller dog sizes were in fact typical of the urban environment – *Kratochvíl 1985a*); the second premolar in the left half of the upper jaw is missing, although this had developed regularly on the right half. The furcula (wishbone) of a gallid bird comes from a juvenile individual, and probably represents domestic fowl. It was not possible to determine from the goose pelvis whether the bone came from a wild or a domesticated form of this species; given the context, however, it would appear to be domesticated.

In terms of taphonomic changes, the proportion of butchery marks is conspicuous. A total of 17 bones (18 %) bear such traces – in general chopping blows made during the portioning of carcasses, or during specific processes of such portioning, e. g. the separation of the ends of bones at the joint. Butchery traces of these kinds were found in particular on ribs and long limb bones, and in one case on a jaw; they were present on the bones of a large ungulate (7x), cattle (5x), a medium-sized mammal (4x) and sheep/goat (1x). By contrast, burning or gnawing of the bones was recorded only on a low percentage of the finds: a single undetermined burned mammal bone was found, as well as a bone with marks left by dog teeth. The bones are relatively well preserved, only in two cases displaying more pronounced erosional changes (apparently thanks to the material being left exposed to the weather).

Layer B10-003 also yielded material obtained through flotation; these fragments were not counted, but the presence of particular taxa were recorded. Other zoological material in addition to bones was also gained – eggshells and egg membrane from the eggs of domestic birds, mammalian hair including

hog bristles (evidently from wild boar), fish scales both cycloid and ctenoid, and fragments of crayfish (*Astacus* sp.) carapace. Further, very small fragments of mammals are present (2 of which were burned to whiteness), including for example the sesamoid bones of medium-sized mammals (sheep/goats?). Numerous bones of small rodents were present, several (including jaws) coming from sub-adult house mice (*Mus musculus*). Fragments were also found of birds, determined as domestic fowl (*Gallus gallus* f. *domestica*) and perching birds (*Passeriformes*). Also found was the shoulder blade of an unidentified frog (*Rana* sp.). A considerable part of the material comprised fish remains, which were not found at all in the hand-collected assemblage. It was possible to determine several fish taxa: pike (*Esox lucius*), cyprinid fish (*Cyprinidae*) – including carp (*Cyprinus carpio*), represented by at least two individuals of different sizes, dace (*Leuciscus leuciscus*), again with two individuals, barbel (*Barbus barbus*), minnow (*Phoxinus phoxinus*), gudgeon (*Gobio gobio*) and probably roach (cf. *Rutilus rutilus*), and furthermore percoids (*Percidae*) including ruff (*Gymnocephalus cernua*). With the exception of carp, these are fish that are hunted rather than bred, and evidently come from various sources.

This small assemblage, then, contains no record of significant introduced or synanthropic species, while the proportion of bones with butchery marks is of course relatively high, reflecting the Early Modern context. At other Early Modern sites, e. g. Prague – Republic Square (first half of the 17th century; *Kyselý 2002*) and Olomouc (16th-17th century; *Kratochvíl 1985a*; *1985b*) do include turkey as a typically Modern element, but in both cases the assemblages were far larger and thus more representative. In terms of the presence of the major economically important mammals (cattle, pig, sheep/goat), it is evident that on Republic Square the representation of bones from the taxon of cattle and sheep/goat are relatively high (both around 34 %), while pig is present only to a surprisingly low degree (7 %); this situation seems similar to that in the cesspit studied here. At another Prague cesspit (Malé Square, 15th-17th centuries; *Kovačiková – Šamata 2002*) pig bones are again present only in small numbers, and there is a preponderance of cattle, followed by the sheep/goat taxon. In Olomouc the situation is somewhat more complex: at several sites in the centre of the city the proportions of cattle and pig during the 16th-17th centuries are relatively similar, whilst at others the proportions of pig bones to those of cattle are relatively low, as is the case of Prague. *Půlpytel* (*1988*, Tábor, 15th-17th centuries) regards the phenomenon of low pig bone occurrence as resulting from their attractiveness for dogs. Given the results from Most (*Petříčková 2002*), where among the 15th century finds pig bones were predominant, while during the 16th century they were replaced by cattle bones, the hypothesis may of course be proposed that there was a change at this time in the preferences for the bred species, for whichever reason.

In connection with the question of the occurrence of fish findings in particular on Medieval and Early Modern sites, it seems that quantities are dependent rather on the potential for preservation and the precision of the method by which material is obtained, than on non-appearance in their original contexts. In some cases they do not survive because of unsuitable sediment quality (*Petříčková 2002*), whilst in other cases only large fish bones were gained during manual collection from layers (*Kovačiková – Šamata 2002*; *Kratochvíl 1985b*; *Kyselý 2002*). If, however, the aim is to create a more reliable picture of the fish species consumed, as is the case here, then the flotation of environmental samples is essential.

Conclusion

The archaeobotanical investigation of samples from the fill of the cesspit in Prague – Karmelitská Street is a typical example of research of Early Medieval faecal/waste pits. In contrast to the hitherto more commonly investigated High Medieval structures, here there was an opportunity to study one from the Early Modern period, which can, moreover, be dated to a very narrow interval (1609-1654).

The assemblage of diaspores of wild species, and especially of field weeds, corresponds with the current soil and climatic conditions in the broader Prague area. Evidence for long-distance trade comes from the finds of Mediterranean products, such as fig, rice and black pepper.

The cesspit yielded some information regarding contemporary human diet as well. Although it is assumed that the basis of the vegetable diet of the time was flour, the proportions of cereal macro-remains were very low; those present included millet beards in particular.

Information regarding meat in the diet came from the archaeozoological analysis (see below). The presence of several herbs, however, is striking, these having been used – according to period cookbooks – to season meat (coriander, juniper, to a lesser extent cumin).

Fruit was an important complement to the diet. The range of primary stone fruits, kernel fruits and nuts was virtually indistinguishable from that of today. There is, however, a conspicuous difference in the pomological quality of the actual fruit consumed. Finds of sclerotic pear "flower bases" attest to the consumption of lower quality, rather small-fruited types with a characteristic ‚hard' (sclerotised) pulp around the remains of the bloom. The small size and rough sculpture of the surface of the pits of plums indicate a variety with small, lower quality fruit, the pulp of which is firmly attached to the stone. The presence of grape pips was conspicuous; these fruit were evidently consumed fresh, and perhaps dried (medieval grapes, unlike those of today, contained a larger number of pips, whether fully matured or stunted).

The finds of cucumber (*Cucumis sativus*) and in particular of sugar melon (*Cucumis melo*) attest to the relatively abundant consumption of vegetables. A true rarity was the discovery of a fragment of the seed of a pumpkin (winter squash: *Cucurbita maxima*) – a similar find from a comparable period is otherwise known only from Syria.

Information regarding the quality and diversity of drinks in the Early Modern period is more fragmentary. In this connection it is necessary once again to consider the mummified find of blackthorn from the lower levels of the cesspit. Such finds have now been made several times on sites within the Prague agglomeration, and their interpretation as leftovers from the preparation of fruit wines or distillation seems very likely to be correct. The recovery of hop achenes, representing the usual basis of beer, is also significant.

The wood and charcoal assemblage, too, served to refine prior knowledge of the running of the Early Modern household. Interpretation was aided by comparing differences in the compositions of the uncarbonised and carbonised wood assemblages. These differences were interpreted as a consequence of the differential use of coniferous trees and hard deciduous trees. Conifers (spruce, fir, pine) were probably used in particular as structural timber, in making shingles, and in craftsmanship. The wood of hard deciduous species (oak, beech) was probably used rather as fuel, and is thus more likely to survive

in the form of charcoal. It would seem that the demand for firewood was met not only from local or regional sources, but also by the import into the city (by floating down the river?) of wood from greater distances (beech). In the case of wood intended for construction and craftsmanship, there was clearly a preponderance of imports (down the river) over greater distances (fir, spruce), and perhaps to a lesser extent the use of resources in the region (pine). Further refinement of these botanic inferences would, however, require a study of period written sources.

The assemblage of bones from hand-collection, despite being so low in number, indicates an interesting fact: the cesspit contained a preponderance of bones from domesticated mammals, in particular cattle and sheep/goat, while finds of pig are absent; wild species also appear, represented by boar and red deer. The range of species if further complemented by birds (fowl and goose) and dog. The proportion of bones with butchery marks is relatively high (18 %); burning, gnawing of bones and erosional changes appear rarely, attesting to the fact that the bones were not stored in the open-air or destroyed by fire, but were simply thrown into the cesspit. Finds from flotation included a relatively broad range of fish (perhaps 8 species), while fowling was also indicated. The species composition of the assemblage may reflect the higher social status of the inhabitants.

Resumé:

Při rozsáhlém archeologickém výzkumu probíhajícím v letech 2003 – 2006 v jižní části pražské Malé Strany byla odkryta a částečně prozkoumána raně novověká zděná jímka. Vznik tohoto objektu byl dendrochronologicky datován k roku 1609. Jímka přestala plnit svou funkci v roce 1654. Vzhledem k vysoké hladině spodní vody byla archeologicky zkoumána pouze svrchní část organické výplně. Získané ekofakty je tak pravděpodobně možno datovat do 2. čtvrtiny 17. století.

Spektrum rostlinných zbytků dokládá klasickou uzavřenou fekálně-odpadní jímku. Svědčí o tom absolutní dominance užitkových druhů (cca 95 %) ve studovaném souboru a minimální podíl lokální rumištní vegetace (do 3 %). Sortiment užitkových druhů rostlin čítal cca 45 druhů, podruhů a variet. Oproti lépe poznaným archeobotanickým souborům datovaným do vrcholného středověku byly ve zkoumaném objektu identifikovány zejména některé importované plodiny: rýže (*Oryza sativa*), pepřovník černý (*Piper nigrum*) spolu s také ve středověku běžným fíkovníkem (*Ficus carica*). Plodiny pocházející z Nového světa reprezentuje nález tykve obrovské (*Cucurbita maxima*) – jde pravděpodobně o první publikovaný nález tohoto druhu v Evropě. K neobvyklým nálezům patří také doklad mišpule obecné (*Mespilus germanica*).

Hodnocený soubor dřev a uhlíků obsahoval 14 druhů dřevin. Nápadné byly rozdíly ve skladbě souboru nezuhelnatělého dřeva oproti uhlíkům. Tyto rozdíly jsme interpretovali jako důsledek rozdílného používání jehličnanů a tvrdých listnáčů. Jehličnany (smrk, borovice, jedle) byly pravděpodobně používány zejména jako stavební dřevo, při výrobě šindelů, v řemeslné výrobě. Dřevo tvrdých listnáčů (dub, buk) sloužilo spíše jako palivo a dochovalo se tak s větší pravděpodobností ve formě uhlíků.

Osteologický materiál obsahoval kosti ručně vybírané i plavené. V souboru převažovaly kosti domácích savců (tur a ovce/koza), prase domácí zaznamenáno nebylo – na druhé straně byly nalezeny pozůstatky lovné zvěře (prase divoké a jelen). Kromě toho byly objeveny kosti kura, husy a psa malého vzrůstu. Relativně vysoký byl podíl fragmentů s "kuchyňskými" zásahy (18 %). Poměrně bohaté byly nálezy v plavených vzorcích – druhové spektrum ryb (až 8 druhů) indikuje rybolov zejména v přirozených vodách; dále byla doložena čižba. Druhové složení zřejmě odráží vyšší sociální postavení tehdejších obyvatel.

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Tab. 1. Results of the archaeobotanical analysis. / ***Tab. 1.*** Výsledky archeobotanické analýzy.

dating		**1606-1654**				
sector		**B10**				
layer		**003**				
size [l]		**40**				
fraction [mm]		**stones**	**> 1 mm**	**0,4 - 1 mm**	**flot**	
analysed part [%]		**100**	**100**	**10**	**10**	
Abies alba	je		1			jedle bělokorá
Aegopodium podagraria	n			15		bršlice kozí noha
Agrostemma githago	s zl		3	2		koukol polní
Anethum graveolens	**dn**		**3**	**1**		**kopr vonný**
Avena sativa	**o pl min**		**3**			**oves setý**
Brassica sp.	s			1		brukev
Cannabis sativa	**n zl**		**5**	**9**		**konopě setá**
Carex sp.	n			1		ostřice
Carum carvi	**n**			**8**	**2**	**kmín obecný**
Caucalis lappula	n		2			dejvorec velkoplodý
Caucalis lappula	n zl		1			dejvorec velkoplodý
Centaurea cyanus	n			1		chrpa modrák
Cerasus avium var. avium	**pe**	**5**				**třešeň ptačí (ptáčnice)**
Cerasus avium var. juliana	**pe**	**83**				**třešeň ptačí (srdcovka)**
Cerasus avium var. durancia	**pe**	**110**				**třešeň ptačí (chrupka)**
Cerasus avium/vulgaris	pe	90	4			třešeň/višeň
Cerasus avium/vulgaris	pe zl	15				třešeň/višeň
Cerasus vulgaris	**pe**	**102**				**višeň obecná**
Cerealia	**st zl**		**2**			**obilniny**
Chenopodium album	n			13	4	merlík bílý
Chenopodium sp.	n			1		merlík
Coriandrum sativum	**n zl**		**6**	**2**	**1**	**koriandr obecný**
Cornus mas	**pe**	**58**				**dřín jarní**
Corylus avellana	**oř zl**	**3**	**1**			**líska obecná**
Crataegus laevigata	**s**		**1**			**hloh obecný**
Cucumis melo	**s**		**1**			**meloun cukrový**
Cucumis melo	s cf.		1			meloun cukrový
Cucumis sativus	**s**		**13**			**okurka obecná**
Cucumis sativus	s min		1			okurka obecná
Cucurbita maxima	**s zl**		**1**			**tykev obrovská**
Daucaceae ssp.	n			3		mrkvovité
Echinochloa crus-galli	o				1	ježatka kuří noha
cf. Fagopyrum esculentum	**n zl**		**1**			**pohanka setá**
Fallopia convolvulus	n		2		2	opletka plotní
Ficus carica	**n**			**25**	**5**	**fíkovník smokvoň**
Fragaria vesca/viridis	**n**		**1**	**454**	**228**	**jahodník**
Galeopsis tetrahit TYP	t			1		konopice polní TYP
Galium aparine	n		1	1		svízel přítula

dating		**1606-1654**				
sector		**B10**				
layer		**003**				
size [l]		**40**				
fraction [mm]		**stones**	**> 1 mm**	**0,4 - 1 mm**	**flot**	
analysed part [%]		**100**	**100**	**10**	**10**	
Galium spurium	n			6		svízel pochybný
Humulus lupulus	**n**			**4**	**2**	**chmel otáčivý**
Juglans regia	**oř zl**	**4**				**ořešák královský**
Juniperus communis	**s**		**5**	**5**	**1**	**jalovec obecný**
Juniperus communis	je			1		jalovec obecný
Juniperus communis	bš		2			jalovec obecný
Leucanthemum vulgare	n			1		kopretina bílá
Malus domestica	**s**		**7**			**jabloň obecná**
Malus domestica/Pyrus communis	s		111	18		jabloň/hrušeň
Malus domestica/Pyrus communis	s zl		36		8	jabloň/hrušeň
Malus domestica/Pyrus communis	já zl		142	7		jabloň/hrušeň
Mespilus germanica	**s**		**2**			**mišpule obecná**
Morus nigra	**s**		**16**	**1**		**morušovník černý**
Morus nigra	s min			1		morušovník černý
Myosotis sp.	t				1	pomněnka
Neslia paniculata	plo zl		1	2		řepinka latnatá
Oryza sativa	**pl**		**1**			**rýže setá**
Panicum miliaceum	**pl**		**6**	**18**	**5**	**proso seté**
Papaver somniferum	**s**			**40**	**53**	**mák setý**
Papaver sp.	s			3		mák
Persica vulgaris	**pe zl**	**4**				**broskvoň obecná**
Persicaria lapathifolia	n			5		rdesno blešník
Persicaria lapathifolia	n zl			2		rdesno blešník
Picea abies	je			1		smrk ztepilý
Piper nigrum	**bo**		**1**			**pepřovník černý**
Polygonum arenastrum	n				1	truskavec obecný
Potentilla sp.	n				1	mochna
Prunus domestica s.l.	pe zl	3	1			slivoň
P. d. insititia bisacuminata	**pe**	**2**				**slíva**
P. d. insititia juliana	**pe**	**10**				**slíva**
P. d. cf. insititia	pe	2				slíva
P. d. oeconomica pruneauliana	**pe**	**4**				**švestka**
Prunus spinosa	**pe**	**111**	**1**			**trnka obecná**
Prunus spinosa	pe zl	1				trnka obecná
Prunus spinosa	mum. plod	5				trnka obecná
Pyrus communis	**kv**		**7**			**hrušeň obecná**
Ranunculus acer	n			1		pryskyřník prudký
Raphanus raphanistrum	ds		1			ředkev ohnice
Raphanus raphanistrum	ds zl		2			ředkev ohnice

dating		**1606-1654**				
sector		**B10**				
layer		**003**				
size [l]		**40**				
fraction [mm]		**stones**	**> 1 mm**	**0,4 - 1 mm**	**flot**	
analysed part [%]		**100**	**100**	**10**	**10**	
Rosa sp.	**n**		**54**	**1**		**růže**
Rubus caesius	**pe**		**6**	**23**	**4**	**ostružiník ježiník**
Rubus caesius/fruticosus	pe				1	ostružiník ježiník/křovištní
Rubus fruticosus	**pe**			**38**		**ostružiník křovištní**
Rubus idaeus	**pe**		**9**	**287**	**1**	**maliník**
Sambucus nigra	**s**		**6**	**16**	**4**	**bez černý**
Sambucus ebulus	s				2	bez chebdí
Secale cereale	ob min		3			žito seté
Setaria pumila	ob		1	1		bér sivy
Setaria viridis/verticillata	ob			1	1	bér zelený/přeslenitý
Silene vulgaris	s			3	1	silenka nadmutá
Sinapis arvensis	s			3		hořčice rolní
Solanum dulcamara	**s**			**27**	**4**	**lilek potměchuť**
Solanum nigrum	s			4	1	lilek černý
Stellaria graminea	s				1	ptačinec trávovitý
Thlaspi arvense	s zl			1		penízek rolní
Trifolium pratense	s			1		jetel luční
Vaccinium myrtillus	**s**			**12**	**43**	**brusnice borůvka**
Viburnum opulus	**s**		**1**			**kalina obecná**
Vitis vinifera subsp. vinifera	**s**		**477**		**1**	**réva vinná (pěstovaná)**
Vitis vinifera subsp. vinifera	s zl			5		réva vinná (pěstovaná)
Vitis vinifera subsp. vinifera	s nezralá			5		réva vinná (pěstovaná)
Indeterminata	-			6		neurčitelné a neurčené diaspory
Suma		612	953	1088	379	**3032**

Legend:
bo – berry, bš – baccate strobile, dv – double achene, ds – loment segments, já – core, je – needle, kv – flower remains, n – achene, ob – caryopsis, oř – nut, pe – stone, pip, pl – lemma, plo – fruit, s – seed, t – carcerulus

min – mineralised dispersion
zl – dispersion fragments

Vysvětlivky:
bo – bobule, bš – bobulovitá šištice, dv – dvounažka, ds – dílky struku, já – jádřinec, je – jehlice, kv – zbytek květu, n – nažka, ob – obilka, oř – ořech, pe – pecka, pecička, pl – plucha, plo – plod, s – semeno, t – tvrdka

min - mineralizované diaspory
zl - zlomky diaspor

Tab. 2. Finds of squash (*Cucurbita* ssp.) from Europe. / ***Tab. 2.*** Dosavadní nálezy semen tykví (*Cucurbita* ssp.) v Evropě.

	Locality	**Identification**	**Dating**	
Hungary	Hollókö-Vár	Cucurbita sp.	16th-17th century	*Hartyányi - Nováki 1975*
Slovakia	Bratislava, Jiráskova Street	Cucurbita pepo	14th-15th century (??)	*Hajnalová 1985*
	Bratislava, Nálepkova Street	Cucurbita pepo	second half of the 15th century - first half of the 16th century	*Hajnalová 1985*
	Bratislava, Panenská Street	Cucurbita pepo	half of the 17th century	*Hajnalová 1985*
Germany	Arnstadt	Cucurbita pepo	17th century	*Lappe 1978*
	Bonn	Cucurbita pepo	18th century	*Knörzer 1991*
Netherlands	Amsterdam	Cucurbita pepo	17th-18th century	*Paap 1984*
Great Britain	Arundel	Cucurbita sp.	17th century	*Hinton, unpublished data*
	Worcester	Cucurbita sp.	18th century	*Moffett 1991*
	Dudley Castle	Cucurbita pepo	1642-47	*Moffett 1992*
	London	Cucurbita pepo	16th-17th century	*Giorgi, unpublished data*
Czech republic	Praha, nám. Republiky	Cucurbita sp.	undated	*Kočár, unpublished data*
	Praha - Chodov	Cucurbita pepo	13th-16th century (??)	*Holý 1973*
	Praha, Petrská Street	Cucurbita pepo	undated	*Opravil 1978, unpublished data*
	Ivančice	Cucurbita pepo	second half of the 16th century	*Opravil 1985*
	Český Krumlov	Cucurbita pepo	undated	*Kočár, unpublished data*

Tab. 3. Overview of the osteological finds (hand-collecting – number of bones, MNI). / ***Tab. 3.*** Přehled osteologických nálezů (ruční výběr – počet kostí, MNI).

species	**druh**	**n**	%	**MNI**	%
Anser anser f. ?	husa	1	2,13	1	7,14
Galliformes	kurovití	1	2,13	1	7,14
Canis lupus f. familiaris	pes domácí	1	2,13	1	7,14
Sus scrofa	prase divoké	1	2,13	1	7,14
Cervus elaphus	jelen evropský	1	2,13	1	7,14
Ovis/Capra	ovce/koza	18	38,30	4	28,57
+ Ovis ammon f. aries	+ ovce domácí	1	2,13	1	7,14
Bos primigenius f. taurus	tur domácí	23	48,94	4	28,57
Large ungulate	velký kopytník	13	x	x	x
Medium mammal	stř. velký savec	6	x	x	x
Mammalia indet.	neurčený savec	28	x	x	x
summa det.	urč. celkem	47	50,00	x	x
summa indet.	neurč. celkem	47	50,00	x	x
summa	**celkem**	**94**	**x**	**14**	**x**

Finds from a Late Medieval well at Rakovník

Nálezy z pozdně středověké studny v Rakovníku

Die Funde aus einem spätmittelalterlichen Brunnen in Rakovník

Kateřina Blažková – Jana Lomecká

Die letzte, 2005 im Zentrum von Rakovník verlaufene Grabung brachte nach einer langen Zeit der Absenz jeglicher Funde wertvolle Informationen über die materielle Kultur dieser Stadt an der Wende vom Spätmittelalter zur frühen Neuzeit, als die Stadt in ganz Böhmen für ihre Bierbrauerei berühmt war. Mit diesem Gewerbe könnte auch der gefundene Brunnens zusammenhängen, da für das Haus, zu dem der Brunnen gehörte, Bierbrauerei schriftlich belegt ist. Die Verfüllung des Objekts enthielt einzigartige Ofenkacheln mit Ziermotiven aus den Hussitenkriegen aus dem Ende des 15. Jahrhunderts, kleine Keramikkrüge und Fragmente eines Glaspokals des böhmischen Typs, die das hohe Niveau der Ausstattung des Hauses auf dem Stadtplatz belegen.

Introduction

During construction of a retail outlet at Vysoká Street 110 in Rakovník, some 30 m north of the north-western corner of the central Husovo nám. (Hus Square), archaeological oversight was provided in autumn 2004 on the basis of a commission from the property owner and investor, who in lowering the original level of the courtyard by some 2 m to facilitate the creation of a basement in the new building initially had not hitherto disturbed any significant archaeological contexts. Photographic documentation only of at least 3 modern levels destroyed by fire had been accomplished.

Fig. 1. Rakovník, Vysoká Street: the well crown after discovery. *Figs. 1, 4-9, 11 photographed by K. Blažková.*
Obr. 1. Rakovník, Vysoká ulice. Pohled na korunu studny po jejím odhalení. *Obr. 1, 4-9, 11 fotoK. Blažková.*

Earth moving continued into spring 2005, when the roughly 0.6 m deep foundation trenches were first excavated. During this stage of work, stray ceramic fragments and animal bones began to appear in the spoil, indicating the presence of Late Medieval to Early Modern cultural layers or features. While sinking the last stretch of the foundations in April 2005 along the north-east wall, parallel to Vysoká Street, at which location all of the excavated material had previously been dumped, the excavator bucket partially disturbed the crown of a well. In the well fill, which consisted of dry stone, several stove tiles and ceramic fragments were found. Construction work was halted, and a rescue excavation by the T. G. M. Museum in Rakovník began (*fig. 1*).

Findspot and site history

The small, almost square courtyard area (roughly 12.6 m x 12 m) of the plot, which slopes slightly from the north-east, was for a long time used as a yard for the storage of raw materials, with a panelled surface. For this reason, it had not

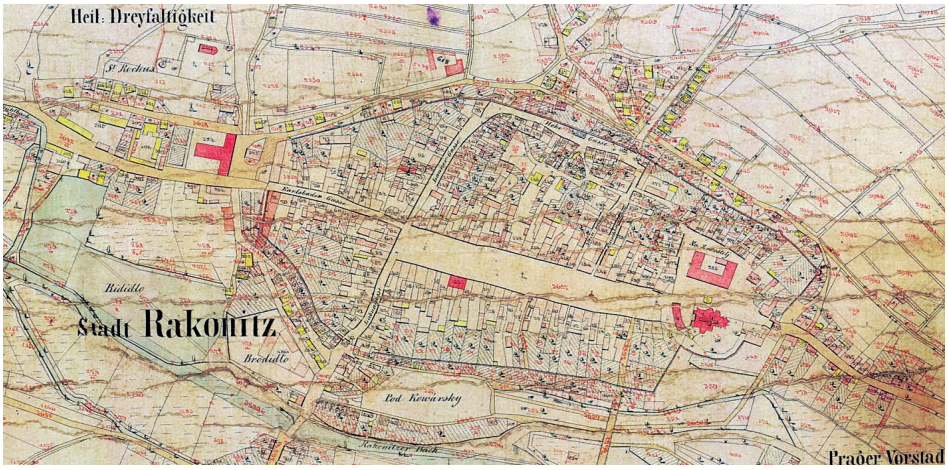

Fig. 2. Rakovník. The historic town centre on an 1841 map of the stable cadastre.
Obr. 2. Rakovník. Historické jádro města na mapě stabilního katastru z roku 1841.

in the past been subject to any deep interventions that might have disturbed the archaeological contexts beneath. The courtyard is somewhat set back from the building line on Vysoká Street, so that access is via a narrow, roughly 10 m long ramp at right angles to the street. It is the yard of the built-up plot of the house "U Číhů", the gable of which faces onto the northern side of the square. It is surrounded on all sides by other buildings, for which reason the lowering of the courtyard was complex both in terms of statics and technical approach, all the more so since the structure intended for the site was a two-storey building with basement.

In 2003 the T. G. M. Museum in Rakovník had conducted the rescue excavation of a pottery kiln with an oval base and clay dome, with an almost undisturbed, entire batch of pots, nearby in U hluboké studny Street, as a part of structural changes to the original garden seating area of the adjacent Česká chalupa (Czech Cottage) restaurant. The dating of this manufacturing feature and the character of the ceramic remains were roughly in accordance with the estimated age of the ceramic material from the well fill, albeit that the shapes and types present were somewhat different. The kiln feature lies just 100 m east of the well in a straight line; together, these are the only compact features from the historic centre of Rakovník investigated archaeologically to date.

The 1841 map of the stable cadastre indicates that the appearance of the land coverage of the plot immediately prior to excavation had remained more or less

Fig. 3. Willenberg's vista, capturing the appearance of Rakovník around 1600.
Obr. 3. Willenbergova veduta zachycující stav města Rakovník kolem roku 1600.

unchanged since the Middle Ages. The open space of the yard is clearly discernible (*fig. 2*). All that happened after 1861 was the shifting of the foundations of the corner house into both the square and Vysoká (then known as Lišanská, Lounská or Poděbradova) Street, which narrowed in consequence (*Herold 1938*, 13). In the 15th and 16th centuries this building was known as the Zkazibabovský house, one of many in Rakovník with the right to brew, and in addition to an actual brewery also incorporated a taproom. In 1567 the whole street was afflicted by a major fire, which may also have resulted in the demise of the original, probably wooden, house and the infilling of the well; on Willenberg's well-known vista of Rakovník from c. 1600, the building appears to be entirely of stone, with two gables facing onto the square (*fig. 3*).

Fig. 4. Rakovník, Vysoká Street: stove tiles with a Hussite theme. On the left, a tile with footsoldiers, on the right Žižka on horseback, and a standard bearer.
Obr. 4. Rakovník, Vysoká ulice. Kamnové kachle s husitskou tematikou. Vlevo kachel s pěšími bojovníky, vpravo se Žižkou na koni a korouhevníkem.

Circumstances and aims of the excavation

Once earth-moving work had been halted and rescue excavations made possible, the cultural fill of the well was removed first, initially using hand mattocks. During work it became apparent that the southern half of the well wall, impacted by the excavator while the foundation trench was being sunk, had not been damaged only thus – the destruction continued to a depth of several metres, and indeed almost as far as the subsequently ascertained water table, which lies at a depth of 4 m. The surviving level of the crown in the north-eastern wall of the area excavated by machine may have been the last, given the 20 cm thick fire layer that corresponded to it, and which indicated the reason for the abandonment of both the buildings and well in the area. With the agreement of a static engineer, the documentation of the north-eastern well wall was followed by removal of the subsequently identified panelling. After this, the destruction debris of the southern half of the structure was carefully removed and re-secured; only then was it possible to continue extracting the fill. The aim of the excavation was remove the cultural material down to the base, in order to ascertain the dates of origin and use of the well.

Excavation method and description of the field situation

Given that the depth of the well was from the outset, after consultation with well-sinkers and dowsers, estimated to be at least 6 m – and after reaching agreement with both the investor and Rakovník town council – the removal of the fill was entrusted to a professional well-boring firm. All material was brought to the surface, where it was sorted, given a preliminary cleaning, and put into storage. For reasons of limited time and spatial constrictions, it was not possible to float the material. Given the homogeneity of the fill, which attests to its having been deposited on a single occasion, it was not necessary to follow the stratigraphic relationships within. The water level was found some 2.5 m above the base.

The base was identified by the professional well-boring firm at a depth of 7 m from the surviving crown, by a strong current flowing from the wall, predominantly from the west and south, bringing sand with it. (After the well had been emptied and the pumps switched off, the well was filled to its original 2.5 m depth of water within 15 minutes). The base was further identified from the small shingles used to clean the water, and the large flat stone that "closed" the well at its base. It was at this level, too, that the cultural material ceased

Fig. 5. Rakovník, Vysoká Street.: stove tile with a floral motif.
Obr. 5. Rakovník, Vysoká ulice. Kamnový kachel s rostlinným motivem.

to appear. In vertical section, the well narrowed towards the base: the diameter at the crown was 1.5 m, and at the base just 1 m.

Ceramic fragments were recovered in the immediate area of the well, but given pressures of time and operational restrictions, these were not subject to more detailed study; the excavators assume that they merely attested to the use of the yard space around the well.

Description of the archaeological finds

Stove tiles

On the very first day of excavation, the well fill beneath the uncovered crown yielded up a unique assemblage of several types of whole stove tiles and fragments thereof (chambered base and cornice tiles, shaped tiles). Among the most valuable of these are three whole chambered tiles – two bearing on the front, warming side figural decoration in relief with Hussite footsoldiers and a rider with banner, and one with a floral motif (*figs. 4, 5*). The former two are the "footsoldier and rider type reliefs with a Hussite theme" (*Krajíc 2005*, 142). The footsoldiers are facing left; two of the three Hussite warriors carry crossbows over their right shoulders, and have hunting knives and knapsacks. The rider behind them has a flail across his right shoulder, and a straight sword at his belt. This is the only figure lacking facial details, in contrast to his two fellows. On the right side part (around a quarter) of the figure of a fourth warrior can be made out, with an arquebus across his right shoulder, and with a pouch and sword on his belt. All the figures are shown wearing iron helms of the "*šišák*" ("skullcap") type, wearing period quilted costume with leather boots that have tuned-up tips. They are shown frontally, except for the legs and shoes, which are in profile. An almost identical model evidently served for the manufacture of tiles recovered during excavations in Prague, and which now form part of the National Museum collections (*Kouba 1966*, 27; more recently *Brych 2004*, 123); the latter are the same down to very fine details, as well as in their dimensions (194 x 188 mm). The mouth of the 80 mm deep chamber ends in a round sleeve some 150 mm in diameter, and of maximum height 30 mm, which is only damaged in one place, with part of the chamber (the missing section accounting for no more than a quarter of the entire periphery). On the right side and upper face, the chamber is pierced with irregular, square handling apertures.

The rider on the second relief sits on a horse, the lower half of the body in profile and *en face* from the belt upwards. He is armed with a straight sword at his belt, while in his right hand he carries a mace that rests on his right shoulder, the end of which is missing; this loss may have been caused by technical issues associated with the manufacture of the mould. On his head he wears a princely cap, while a square bandage covers his left eye; by analogy the figure has therefore been identified with Jan Žižka. In font of him walks a standard bearer, seen from the front, again with a sword on his belt (the bent tip indicating that this was a ‚malchus'); he carries a banner in bother hands, on which no emblem is visible (most of the banner area is, moreover, covered by the standard bearer's head). These latter details make the relief a hitherto unknown type, as the majority of the analogous tiles – e. g. those from Lipnice Castle near Havlíčkův Brod or from Prague – display a chalice on the banner (*Brych – Stehlíková – Žegklitz 1990*, 37), or a cross, or sometimes both. Neither the rider, who might therefore represent any other leader rather than just Žižka,

nor the standard bearer are wielding swords. An analogous fragment from Staré Město shows a rider with a sword at his belt, but lacks the eye patch (*Hazlbauer 1998*, 206; *Richterová 1982*, 17; *Brych 2004*, 125). The details of the rider's horse (and especially of the legs) are also somewhat different, but in all of the reliefs the horse's gender is pronounced, making it clear that this is a stallion. The wheel spurs and bridle are shown in great detail. On this relief the horse is not whole, again probably for reasons relating to the technology in use. The front, warming wall measures 192 x 185 mm. The mouth of the 80 mm deep chamber ends in a round sleeve 170 mm in diameter, and with a maximum height of 20 mm, which is only damaged in one place, with part of the chamber (the missing section accounting for no more than a quarter of the entire periphery). On the left side of the chamber is a round, handling aperture.

Another of the stove tiles to survive intact has a warming face decorated with a floral relief. It displays stylised, fiver-pointed roses or rosettes with leaves and hop cones around (*fig. 5*). A fragment of an analogous tile is known from earlier finds made in Rakovník (*Hazlbauer 1993*, 21), while the only complete example comes from Týřov Castle (*Pavlík – Vitanovský 2004*, 432, cat. no. 1228). The various pieces differ slightly in their details. As with the preceding two tile types, this tile with this motif too is dated to the period around the middle of the 15th century. The warming face measures 197 x 188 mm. The mouth of the 90 mm deep chamber is, as in the previous examples, finished by a round sleeve, 160 mm in diameter and with a maximum height of 20 mm, with a third of the periphery missing. On the right wall of the chamber a round manipulation aperture has been cut through. All three of the tiles described above are of the same, light ochre colour; the inside of the chamber is smoke-blacked and full of soot. After laboratory processing, it was possible to identify still another motif.

Fig. 6. Rakovník, Vysoká Street: fragment of the warming face of a stove tile, with part of a relief bearing the heraldic motif of a Bohemian lion.
Obr. 6. Rakovník, Vysoká ulice. Zlomek čelní vyhřívací stěny kamnového kachle s částí reliéfu s heraldickým motivem českého lva.

The incomplete, approximate one third of a warming face to survive from a dark ruddy brown, chambered tile, bears the motif of the evangelist St. Matthew in the form of an angel, with an inscription band in his left hand (the inscription is illegible). For this piece too there is an analogous find – albeit one that differs slightly in its details (e. g. the treatment of the wings) – this time from excavations at Křivoklát Castle, and dated to the second half of the 15th century (*Pavlík – Vitanovský 2004*, 335, cat. no. 194). In contrast to the preceding tiles, the 80 mm deep chamber with round sleeve 140 mm in diameter and a maximum 15 mm in height survives almost intact, and bears only minor traces of smoke. No manipulation apertures are cut through.

It is notable that the latter two relief-decorated tiles have their analogues in castle *milieux*.

In addition to yielding up whole, or at least large, pieces, the fill was also found to contain smaller fragments of the warming walls of chambered, relief-decorated stove tiles, displaying a motif of a five-pointed rose and hop cones in several cases. Also present were four, dark ruddy brown pieces with a sculpted border, where the missing relief makes more precise identification impossible. Lastly, one piece of a light ochre-coloured warming wall bears a relief depicting the heraldic motif of the Bohemian lion (head with protruding tongue, and parts of the mane – *fig. 6*).

Also found during the excavation were three whole, dish-like tiles with varying mouth dimensions (180 x 100 mm, 187 x 142 mm, 205 x 145 mm), and of varying depths and colours (from pinkish through grey to yellow); another five almost complete pieces with mouth dimensions of 190 x 162 mm, 180 x 142 mm, 190 x 152 mm, 182 x 142 mm and 188 x 152 mm) were re-assembled from smaller fragments. On most, the inner, silvery colour of a micaceous slip could be seen,

Fig. 7. Rakovník, Vysoká Street: araucarite (fossil wood) from the well fill.
Obr. 7. Rakovník, Vysoká ulice. Araukarit ze zásypu studny.

Fig. 8. Rakovník, Vysoká Street: architectural element – a massive sandstone block.
Obr. 8. Rakovník, Vysoká ulice. Architektonický prvek – mohutný pískovcový kámen.

Fig. 9. Rakovník, Vysoká Street: a quadrangular sandstone paving stone with mortar fragments.
Obr. 9. Rakovník, Vysoká ulice. Pískovcová čtyřhranná dlaždice se zbytkem malty.

which however quickly disappeared during washing. On the outer face of one piece was an apparently chance band of black, lead glaze, and a 3 cm long protuberance as if a handle had been broken off. This single exemplar, of which roughly half survives, shows no obvious soot blacking, or the remains of the daub that on all the other pieces indicates their use. It is not impossible, therefore, that this was an unsuccessful piece from the pottery workshop.

With only one exception the cornice tiles are not complete, and the number of fragments thereof is considerably lower than is the case for the preceding two types. Most of the fragments have a deep red slip, and their fronts have a convex rolled section and concave flute, but without crenellations or any other decorative element. Inside they are heavily blackened, and the only piece to survive entire has the mouth of the 150 mm chamber terminating in a sleeve.

Among the fragments there were also a small number (under 30) of smoke-blacked and locally daubed parts of what had evidently been a ceramic, cylindrical smoke pipe for the removal of incinerated material; this has been reconstructed as having had a diameter of 125 mm.

As regards the assemblage of stove tiles, it is impossible to simply say whether they come from one or from several stoves. The outer characteristics of the tiles allow only the inference that one or more stoves was functional, and for a certain period used for heating purposes.

Stones

Beneath the fill of tiles and above the water level, the finds were mainly ceramic sherds, bones (primarily from poultry and pigs) and stones. In the fill containing parts of the ruined well structure, comprising mainly shale and quartzites (the so-called "sun stones") a large number of araucarites (fossilised woods) of various sizes (the longest some 40 cm in length), shapes (depending on truck shape) and colours (*fig. 7*). The closest site at which these occur in large numbers is Hlavačov, 4 km away.

Some of the quartzites were of larger dimensions and irregular in shape (the largest measuring 50 x 40 cm), and these were certainly not part of the well structure. These stones originate from Jesenice, some 20 km distant, and given their sculpted appearance and sometimes deep ochre colour they are highly esteemed even today, and are used primarily for decoration and as structural elements in gardens.

The well fill also yielded sandstone architectural elements. A large sandstone block, rectangular in shape, bears on one side a quadrangular incision, which may indicate that it was the transom beneath a wooden truss; the damage to this section, however, means that unfortunately it is not possible to establish the actual size of the aperture (*fig. 8*). On two other sides small incisions into the edges are apparent, which might perhaps have been a detail linking this structural element into the architecture. An undecorated, smooth, quadrangular paving stone with a round mortar fragment on its underside shows clear indications of wear on its upper (*fig. 9*). Both of these sandstone elements are ochre in colour, and while the structural element is from friable sandstone, the paving stone is smooth and hard.

All the types of stone were evidently caught in the fire that destroyed the buildings here, as it seems highly unlikely that such large and unusually heavy pieces of quartzite and araucarite were brought to the site over such long distances just to fill a well. What exactly they were used for is a subject for speculation. In addition to the sandstone structural elements and the paving stone,

the samples retained were approximately the 10 largest pieces of araucarite and 5 pieces of quartzite.

Kitchen- and tableware

The largest ceramic assemblage was extracted from beneath the water level, this comprising in particular several whole vessels (5 pieces), mostly painted jugs of very small dimensions, the smallest – with an inner green glaze – being just 9 cm high (*fig. 10: 1*, *2*). It was also possible to reconstruct several other jugs and pots (5 pieces; *fig. 10: 3*). Among the numerous sherds (around 2000) were a small number of lids with handling knobs, mostly jug fragments again but also including a small number of pots (*fig. 10: 4*). There were also occasional fragments of painted dishes, both with and without perforated handles. One sherd was evidently part of a small ceramic funnel (*fig. 10: 5*).

The majority of the fine-walled ceramic ware with a smooth surface was made from finely washed, light ochre, grey and red earths, with a small quantity of microscopic mica and fine stone admixture, and which are fired medium hard to hard.

The painted, decorative wavy lines, lines and screws beneath the necks and on the bulges of the vessels are predominantly red or brown in colour. Among the most interesting pieces is a deep, reconstructed bowl painted on the inside with irregularly spaced red lines and on the outside decorated with complex spirals (*fig. 10: 6a*, *6b*). The body of a small jug with red painted decoration of some kind of tree or wavy line and a vertical line across the whole bulge to the base originated in the same fashion (*fig. 10: 7*). The decoration on these two pieces shows the means by which they were made. Their makers in both cases used a tool similar to a veining brush (several brushes bound together) so that lines always appeared the same distance apart.

A very small percentage of the ceramic sherds have green and orange glazes on their insides (no more than 10 pieces), including one piece of a hollow tripod stand with a light brown glaze within that places the latest possible date for the fill to the beginning of the 16th century. Exceptionally (only a few dozen sherds) there were also examples of reduction fired vessels with a simple, horizontal groove beneath the neck. Some of the sherds also bear decoration made by tracing wheel. In some pieces poor firing is evidence, while others became fused in the house fire; smudges on several fragments may have been caused by their long-term deposition in the well fill.

The rim profiling is similar to that on the ceramics recovered from the potter's kiln during rescue excavations in nearby U Hluboké Studny St. in 2003, albeit that typologically the wares are somewhat different. In most of the pots there is a flared, obliquely curtailed rim, in smaller numbers grooved from the inside for a lid and bordered on the outside for the better pouring out of their contents (*fig. 10: 8*). The jugs have rims that are assorted variations on the ruff. Their bases are in general double, and several of the larger vessels (e. g. bowls) and jugs bear traces of cutting.

In general, the assemblage of ceramic vessels and fragments thereof recovered in the main from the lower section of well can be said, in comparison with the stove tiles that clearly date to the period after the middle of the 15th century, to consist of material that is somewhat later in date, i. e. from the end of the 15th to early 16th centuries.

This confirms the excavators' assumption as to the longer-term use of stove tiles, and the filling in of the well as a single event at the beginning of the 16th

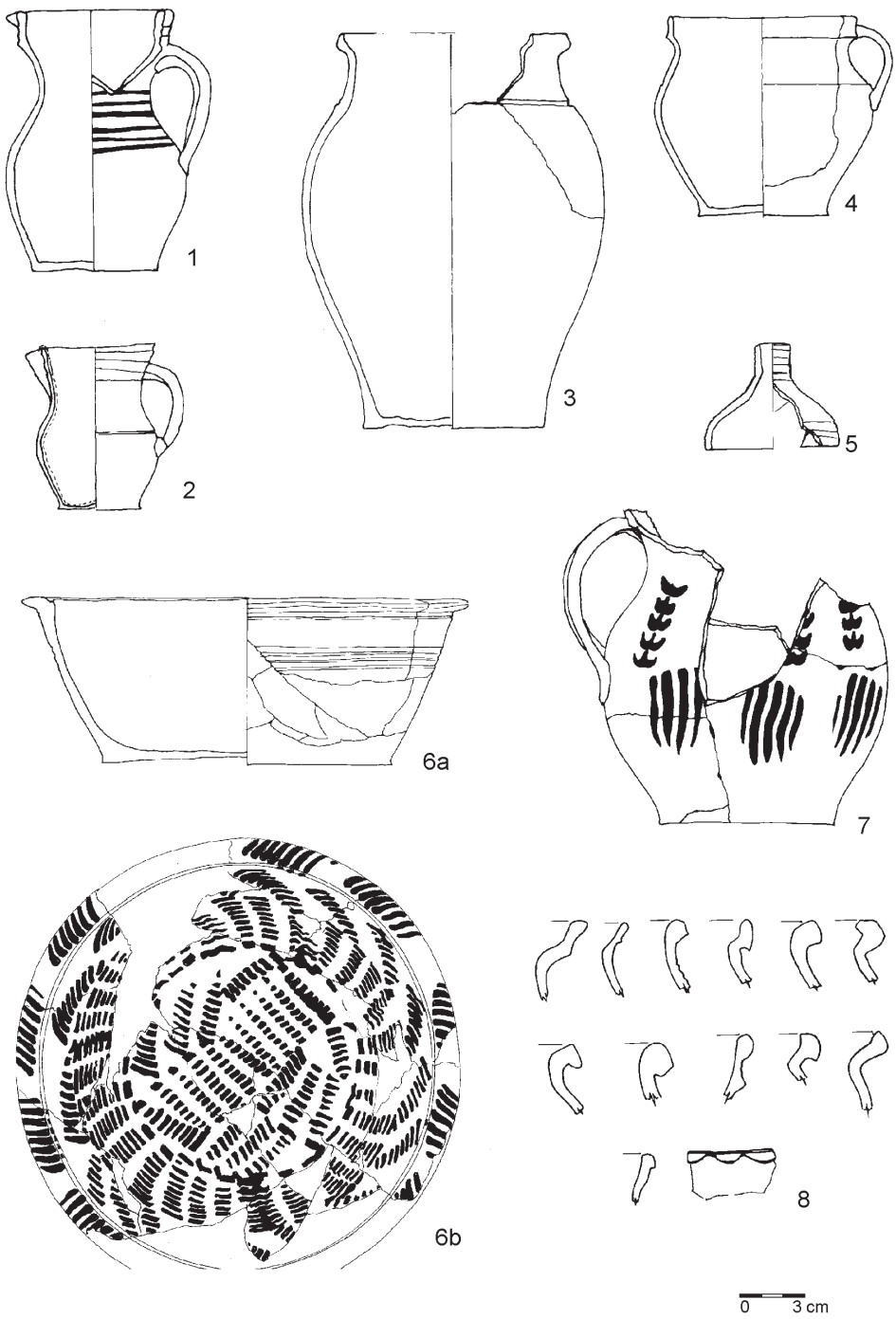

Fig. 10. Rakovník, Vysoká Street: selection of whole and reconstructed ceramic vessels (1-4), a small ceramic funnel (5), painted bowl and jug (6, 7) and an example of a profiled rim (8). *Drawn by D. Blažek.*
Obr. 10. Rakovník, Vysoká ulice. Výběr celých a rekonstruovaných keramických nádob (1-4), keramický trychtýřek (5), malovaná výzdoba mísy a džbánku (6, 7) a ukázka profilace okrajů (8). *Kresby D. Blažek.*

century. The ceramic assemblage contains both the highest quality, unglazed, light oxidation wares with a smaller percentage of glazed pieces, and a negligible quantity of reduction wares that have thus far escaped assessments of Rakovník ceramic production. On the basis of 1996 rescue excavations it had been assumed that this period was represented not only by light glazed but also rather by reduction fired ceramics, while the light oxidised wares with red painted decoration dates to the first half of the 15th century (*Vařeka 1998*, 131).

Wood and metal

In addition to the ceramic material, an assemblage of metal items (spikes, fittings, an awl) was also recovered from beneath the water level, outstanding among which were a bucket hoop with minor wooden fragments and a hook for

its withdrawal. All of the heavily corroded fragments and items were packed in hard earth with ceramic sherds. Attempts to remove them led to the complete disintegration of the artefact mass, which considerably complicated cleaning and identification. For this reason, the metal objects (12 pieces) were conserved in the form in which they were recovered.

Glass

Among the most valuable finds are a fragment of a thin-walled glass vessel measuring roughly 5 x 2 cm, with sculpted decoration. It was made from white, translucent glass, which after removal immediately corroded to white in the air. After consultation and expert conservation at the West Bohemian Museum in Plzeň it was determined that this was a piece of a goblet of the so-called Bohemian type, with pearl appliqué (one piece of which is evident, and at least one piece more has broken off). In Bohemia such goblets are dated to the second half of the 15th century (*Frýda 1992*). Given the small dimensions of the fragment it is impossible to say exactly which variant is represented here, but its drop may suggest that it was in the shape of a flute (*fig. 11*).

Other finds

Among the ceramics and stones above the water level, a very small quantity (no more than 10 pieces) of very small pieces (< 5mm) of eggshell and shell were identified and recovered. These occurred at one position only, some 0.70 m above the water level.

The animal bones, which appeared fairly regularly throughout the fill, reflect the medieval dietary norm – poultry and pig bones appear most often.

Fig. 11. Rakovník, Vysoká Street: fragment of a glass goblet of the Bohemian type, with pearl appliqué.
Obr. 11. Rakovník, Vysoká ulice. Zlomek skleněné číše českého typu s perlovými nálepy.

Conclusions

The reasons for the filling in of the well at the beginning of the 16th century are not yet clear, but given the discover of the partial destruction of the well wall, constructed out of layered dry stone only, may permit us to speculate that it was due to this partial collapse that it was subsequently filled in and thereby closed. It was filled using, logically, stone and other material from a house that had obviously been destroyed by fire.

Given that this is one of the first features of this type to be investigated in Rakovník it is a very valuable find, of great value to the archaeological understanding of everyday life in the town during the Middle Ages.

Because the site is the yard of a house that faces onto the square, this material evidence is an important indicator of the social level of a Rakovník burger in the post-Hussite period in a town that throughout its history had always remained more or less loyal to the sovereign.

The well feature itself, with sufficient water, will perhaps be preserved by the investor and presented as part of the interior of the building to stand on the site – a welcome means of conserving a historical feature. The welcome co-operation of the Rakovník town council, which contributed financially to the excavations, must also be described in this sense as exceptional. Together with the pottery kiln feature, the results of the well excavation were presented to the public in the form of an exhibition and lectures.

Resumé:

Poslední záchranný archeologický výzkum z roku 2005 v centru města Rakovník přinesl po dlouhé době absence jakýchkoli nálezů z důvodu nepřítomnosti archeologa (s výjimkou výzkumu hrnčířské pece v roce 2003) cenné informace o hmotné kultuře města na přelomu pozdního středověku a raného novověku, kdy se město proslavilo po celých Čechách svým pivovarnictvím. S ním také mohl souviset archeologický výzkum zkoumaného objektu studny. V domě, k němuž patrně patřila zmíněná studna, je vaření piva doloženo písemnými prameny. Zásyp studny obsahoval především keramický střepový materiál, ale i celé nádoby (převážně džbánky), dále kosti, zbytky skořápek a škeblí, železné obruče ztraceného vědra i s jeho dřevěnými zbytky, zlomek skleněné nádoby, pískovcové architektonické prvky a zkamenělá dřeva (araukarity). Tyto hmotné doklady jsou významným ukazatelem sociální úrovně rakovnického měšťana v pohusitské době v katolicky smýšlejícím městě, které bylo v průběhu dějin vždy víceméně loajální k panovníkovi.

K nejcennějším nálezům patří soubor několika typů kamnových kachlů (komorové základní a římsové, nádobkové), z nichž k nejzajímavějším patří dva celé komorové kachle s reliéfem husitských bojovníků a Žižkou na koni. Jedná se o tzv. pěší a jezdecký typ kachle s husitskou tematikou. 2 ze 3 bojovníků na pěším typu nesou kuše přes pravé rameno a u pasu mají zahnuté tesáky a tornu. První bojovník zleva má přes pravé rameno položený cep a u pasu rovný meč. Ten jediný nemá – na rozdíl od svých dvou spolubojovníků – patrné detaily obličeje. Na pravé straně je vidět část těla čtvrtého bojovníka s hákovnicí přes pravé rameno a s váčkem u pasu. Všichni mají na hlavách železné klobouky, tzv. šišáky, a jsou dobově oblečeni a obuti do kožených bot se zahnutými špicemi. Žižka na jezdeckém typu kachle sedí na koni a je ozbrojen rovným mečem u pasu a palcátem opřeným přes pravé rameno. Na hlavě má vévodskou čapku a přes levé oko čtvercovou pásku. Před ním jde korouhevník rovněž s mečem u pasu (zahnutá špice napovídá, že jde o tzv. malchus) a s korouhví, na níž není patrný žádný znak. Tyto poslední dva detaily činí z tohoto reliéfu nový, dosud neznámý typ, neboť na většině analogických kachlů např. z hradu Lipnice nebo z Prahy je na korouhvi kalich nebo kříž, případně oboje, a ani Žižka ani korouhevník nejsou ozbrojeni.

Další druh komorového kachle nese rostlinný reliéf, a sice stylizovanou pětilistou růži s chmelovými šišticemi. Analogický kachel pochází již z dřívějších nálezů z Rakovníka, ale také z hradu Týřova, a stejně jako předchozí dva komorové kachle je datován do období kolem roku 1500.

Důvod jednorázového zasypání studny počátkem 16. století naznačuje 20 cm mocná požárová vrstva, která korespondovala s korunou studny a svědčí o mohutném požáru na této parcele.

Vzhledem k tomu, že se jedná (vedle výzkumu hrnčířské pece z roku 2003) o jeden z prvních zkoumaných objektů tohoto druhu v Rakovníku, jde o cenný nález pro archeologické poznání každodenního života města na přelomu středověku a novověku.

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