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Water Quality as a Key Factor in the Success of Świdnica Beer During the Middle Ages and the Early Modern Period

Water and access to water have been key determinants of the location of human settlements since prehistoric times. This certainly holds true for the settlements surrounding today's Świdnica in the period preceding the city's municipal charter. The turbulent flow of the Bystrzyca river and its tributaries provided plenty of water. Because of the region's dense network of watercourses, numerous streams were used to power watermills, as attested in sources dating from the early Middle Ages onward. The abundant water resources of the Świdnica Plain initially made it unnecessary to draw water from underground. This situation changed in the early 1240s, when the chartered city of Świdnica was founded on a terminal moraine ridge and the terrace of the Bystrzyca River, with its highest point rising 26 metres above the river level. In the final decades of the 13th century, a ducal castle was constructed in this area, enclosed by defensive walls erected alongside the growing town. Due to the city's position on the slope of a post-glacial hill and its foundation on previously undeveloped land, inhabitants were compelled to obtain water from underground sources.¹

Located in historical Silesia and chartered under Magdeburg law (the so-called "German" law), Świdnica developed an economy strongly centred on brewing – a craft that soon expanded to an almost industrial scale. Not only did this lead to the growth of the necessary infrastructure but also the urban expansion of the city and a quick replacement of its initially wood and clay (wattle and daub) buildings with masonry structures. The policy granting higher beer production quotas to

¹ Sowina U. 2016, p. 167.

tavern-keepers who expanded their buildings vertically with additional brick or stone storeys proved a decisive factor in this remarkable architectural transformation. For every storey they built, they were able to brew an extra batch of beer.² This radical redevelopment was also made possible thanks to relatively easy access to granite stone extracted in the city's vicinity. Mediaeval Świdnica also had brick-yards, although bricks were less commonly used for local construction purposes. It is, therefore, quite conceivable that the use of deep-lying underground water resources in the city centre meant that wells made of durable split granite stone sealed with sand, clay and lime mortar rather than wooden structures popular in many commune municipalities of the North European Plain. This was most apparent in wells owned by beer-brewing townspeople – i.e. tavern-keepers – who ranked high on Świdnica's social ladder. When discussing its structure, one should take a brief look at the origins of the legal relations in 13th-century Polish municipalities chartered under Magdeburg law. Established *in cruda radice* (on undeveloped land), probably in the 1240s, Świdnica was one of such cities. Its municipal privileges were probably granted by Bolesław Rogatka or his brother Henry III; it is also likely that the city's foundation was initiated by their mother Anna, widow of Henry the Pious. In 1242, Anna also chartered nearby Strzegom.³ In 1243, Świdnica was mentioned in writing in the context of the establishment of the village of Pszenno, although the authenticity of the document is frequently questioned.⁴ The oldest fully credible document containing a reference to Świdnica's early years as a communal city is a papal bull issued by Innocent IV in 1249, in which the head of the Church granted a 40 days' indulgence to all who supported the construction of the local church and the Franciscan monastery; so far, it has not stirred any controversy among researchers.⁵

From the outset, the first settler-colonists focused on brewing as a foundation of the economic life of the newly built city, as evidenced in both written sources and archaeological studies within the borders of the settlement. Of significance to this process were regulations combining the early-mediaeval tavern right (*ius tabernae*) with new legislation enacted by cities chartered according to the so-called "German law."⁶ To date, the earliest documented example of this hybrid framework is the grant of city privileges to Płock by Konrad I of Masovia in 1237. The city charter

² Chorowska M., Karst D., Lasota C. 1998, p. 167.

³ The first of the brothers ruled the Duchy of Wrocław after the death of his father Henry the Pious in 1241, see: Jureczko A. 1986, p. 13; the other one did not obtain the Wrocław province until 1248, see: Jurek T. 1987, p. 81.

⁴ SUB, vol. 2, no. 257, pp. 154-155.

⁵ SUB, vol. 2, no. 373, p. 236.

⁶ Cieśla I. 1958, p. 187 et seq.; Karst D. 2024, p. 131.

issued by Piotr Bishop of Płock defines the rights and obligations of a municipal commune, referred to as *nova civitas*, established on the land of the local cathedral chapter. On that land, twelve plots were earmarked as “taverns” (*tabernae*). They were released to “guests” as hereditary leasehold, for which rent could be paid individually or collectively, by the entire commune.⁷ Shortly thereafter, in the city of Świdnica chartered presumably between 1242 and 1249, plots also referred to as “taverns” were given out to settlers. This proves that municipal settlements established in Poland according to the Western (mainly Polabian) model or translocated on the basis of the same, the brewing privilege was an intrinsic part of the *civitates established* in the region. Chronicle entries unconfirmed in documents claim that Świdnica was granted brewing privileges allegedly in 1244. Apparently, that year, Peter Block of Nuremberg opened the first brewery in the Market Square.⁸ In the light of the above circumstances, that statement seems very likely and may imply that the year corresponded to the foundation of the city.

In this robust and renowned brewing centre, from its beginnings as a communal town to as late as the 17th century, water was drawn exclusively from deep wells which were private property of townspeople, mainly tavern keepers.⁹ Deprived of their own water intake, other inhabitants had no other option but to use public wells or purchase shares in their neighbours’ wells. Hydrogeological studies conducted in the city and the neighbouring villages since the 1960s revealed the existence of “Świdnica’s fossil valley,” an underground body of water which, due to its capacity, is considered an exceptional resource in the whole Pre-Sudetic Block. The studies showed that the underground system comprised Tertiary and Quaternary aquifers. The former were formed mainly by sedimentary mudrocks up to 250 m thick, containing lenses of sand, gravel, and sand and gravel sediments, separates from newer layers by layers of impermeable clay. According to the aforementioned research, the latter, Quaternary aquifer was made of Pleistocene river sand and pebble gravel of thickness ranging from 6 to 8 metres, reaching down to 20 m and partly supplied by waters infiltrating from the Bystrzyca River which flows through the city.¹⁰

So far, archaeological and architectural studies in Świdnica’s Old Town allowed researchers to discover three deep wells with preserved water tables: two in the Market Square and one in westward-leading Kotlarska street. Artificial hydrological sources situated in the heart of the chartered city: one in the mid-market section

⁷ Dygo M. 1993, pp. 10-11; Trawkowski S. 1962, pp. 731-743.

⁸ Schubert H. 1911, p. 117.

⁹ Sowina U. 2012, p. 421.

¹⁰ Morasiewicz J. 1975, p. 282.

dating back to the 13th century and another in the northern frontage of the former market, in the annexe of the townhouse at Rynek 4 (Market Square), were supplied from an aquifer described as “Quarternary” in studies from the second half of the 20th century. The house is located on an elevation of ca. 225 m a.s.l. Given that the height of the surface of the centre, i.e. the Market Square, is 240-241 m a.s.l., the aforementioned layer is situated underneath, at the depth of 15-16 m.¹¹ The first hydrotechnical structure was located in the southwest corner of the market square block and was generally accessible, while the second one was private property. In the public well, the water table was at the depth of approx. 16 m from today’s ground level, whereas in the private one, water could be found at a depth of ca. 18 m. The third artificial water intake, excavated during the Middle Ages to the south of Kotlarska Street, was the deepest. Its vertical shaft – approximately 19 meters deep and lined with stone – reached an aquifer that can likely be identified as belonging to the “Quaternary” level beneath the area of Świdnica’s Market Square. The elevation of Kotlarska street, pointing westward from the Market Square in the direction of the former castle, is approximately 244 m a.s.l., which is 3 m higher from the surface of the Market Square. Hence, the groundwater flow supplying the well was situated roughly at the same depth as in the core area of the city centre.¹² Therefore, all three water intakes built in the Middle Ages are still operational and, according to research performed to date, contain water more or less at the Quarternary aquifer whose position in the Old Town area was determined in the course of hydrogeological boreholes drilled in the 1960s.¹³

The wells deserve closer attention due to their significance for the subject matter of this article. The public well discovered in the southwest corner of the block forming the central development area of the Market Square was originally contained in a separate building. Internal dimensions of the rectangular “well house” discovered during architectural research were 3.45 m by 2.7 m; the structure was covered with a brickwork shelter on top of which was a pointed helmet, which is confirmed by the iconography of the period.¹⁴ As proved shortly after by archaeological studies, the foundation of the structure housing the well was supported directly on its casing, which was made from split granite mixed with erratics and brick fragments. The inner diameter of the shaft was ca. 2.3 m, and its lining was 1.2 m thick. A water table was encountered at the depth of 16 m. Its construction technology and relations to adjacent masonry structures were analysed in architectural studies in

¹¹ Chorowska M., Lasota M. 2013, p. 291; Karst D. 1998; Sowina U. 2012, p. 182.

¹² Karst D. 2017.

¹³ Morasiewicz J. 1975, p. 282; Sowina U. 2012, p. 167.

¹⁴ Czerner R., C Lasota C. 1997, p. 119. Authors interpreted the function of the structure as the “Weighhouse” (Polish: “Dom Wagi”) but allowed for a different use of the building.

the early 1990s, enabling researchers to date its origins to the second half of the 15th century.¹⁵ The second well situated in the city centre was discovered in the annexe of the townhouse at Rynek 4. The outhouse above the hydrotechnical intake was dated to a relatively recent period, i.e. the end of the 19th century; the front masonry townhouse was probably built after 1401, replacing the former wattle and daub structure. Originally, the well was located in an open courtyard, at the back of the townhouse. Its shaft was 18 m deep and the diameter of its casing was 2 m at the top, narrowing down to 1.25 m at the bottom.¹⁶ The third mediaeval well with a water table at the bottom was discovered at the back of the townhouse at Kotlarska 19, which in the first third of the 18th century became part of the Ursuline monastery compound. Currently, the monastery building and the adjacent church belong to the Sanctuary of St. Joseph Defender of Families, run by Pauline Fathers of the Jasna Góra Monastery. This artificial hydrotechnical structure, unearthed during archaeological research in what was originally a townhouse courtyard and, later, the central point of the monastic courtyard, was not only quite deep (with the water table at -19 m relative to today's ground level) but also stood out due to a wealth of recorded history. According to historical sources, behind the townhouse which today corresponds to property at Kotlarska 19, was a mediaeval malt house with a well supplying the establishment.¹⁷ At the end of the 14th century, the entire plot, together with the buildings and structures, was owned by Mertin Husdorf. His neighbours helped him to build the well in exchange for shared use of the water source. Hensil Crospe, whose property bordered the malt house and the deep well to the east, was a partner in the undertaking. As provided for in an agreement of 25 March 1380, the townsman owned $\frac{1}{4}$ share in the well.¹⁸ Archaeological studies in 2017 at the courtyard of the former Ursuline monastery, during which the well was discovered, supplemented relevant information, hitherto found only in written sources. Seen from above, the well casing, which extended above ground level, was oval, slightly egg-shaped, with its minimum and maximum inner diameter of 2.0-2.45 m. Its design was conceivably dictated by the ease of access also by the neighbour to the east, as its edge was close to the boundary between the two plots. The deep shaft, reaching the aquifer, was lined with slabs made from split granite, bonded with sand, clay and lime mortar. It was at least 20 m deep; the water table was 19 m below the surrounding ground level.¹⁹

¹⁵ Karst D. 1998, p. 2.

¹⁶ Chorowska M., Lasota C. 2013, p. 291.

¹⁷ APWr., *Akta m. Świdnicy* 235, sheet 72v; *Atlas Historyczny Miast Polskich* 2008; Goliński M. 2004, p. 76.

¹⁸ Goliński M. 2003, p. 76.

¹⁹ WUOZ/D. Wałbrzych, sp. 6

Within the historic urban core of Świdnica – encompassing the chartered city boundaries and listed as a heritage site – archaeologists have uncovered the remains of more than a dozen wells. Of these, only three, as previously described, were exceptionally well-preserved, with their lower sections reaching the groundwater table. Although Świdnica remains relatively understudied from a hydrotechnical perspective, the substantial number of artificial water intakes discovered in recent years suggests that as early as the first half of the 13th century – when the early communal centre was already developing around beer production – access to abundant, high-quality water was of crucial importance. Enclosed within defensive walls and situated on the high river terrace and the terminal moraine slope, the city was only able to source water from private and public wells, which, by contemporary standards, were very deep.²⁰ The most technologically advanced ones were dug out on the land of fully-fledged townspeople who were members of Świdnica’s tavern keepers’ guild. The structures were built with shafts partly dug out in rock, lined with granite stones, less often with erratics, with a small number of bricks. The high cost of building the well was compensated by its function in the brewing process, although water drawn from the well could also be used for other (food- or hygiene-related) purposes.²¹ City residents with tavern keeper’s privileges who came from the original settlers or their descendants had the exclusive right to make beer for commercial use. Still, even for them the financial and technological effort of building wells was so tremendous that they needed to establish partnerships with several neighbours.²² This state of affairs, often detailed in *acta municipalia*, is also confirmed in archaeological studies, as all private wells discovered in the course of research to date were located near property boundaries, enabling all partners to use them, primarily during the brewing season. Information contained in the documents we learn that the wells in Świdnica built with neighbourly assistance were afforded special legal protection. Shareholders in the undertaking usually enjoyed free access (“free passage” or “free gate”); *acta municipalia* sometimes contain the provision that while brewing beer, the gate

²⁰ Sowina U. 2012, p. 171.

²¹ According to a tax census commenced in 1401, there was a bath house (*domo balnei*) in the rear section of a large house next to the western frontage of Piotrowa St. (currently Bohaterów Getta St.), between the city gate and Pańska St.; therefore, the discovered water source must have supplied water to the facility, see: APWr., *Akta m. Świdnicy* 235, sheet 77v. The Jewish community, who built the synagogue in the western block of the development surrounding the Market Square, was able to use Hannos Lobecher’s well as long as they paid for their share, see: APWr., *Akta m. Świdnicy* 115, sheet 60.

²² According to the earliest *acta municipalia* records, dated to 1377, the shares of townspeople using their neighbours’ wells had three possible values: 1/2, 1/3 or 1/2 (Goliński M. 2004, p. 76.).

leading to the neighbour's courtyard was to remain open "day and night" so that water could be carried through the "court," i.e. the townsman's plot.²³ Moreover, a shareholder in the well had to bear the cost of its renovation, as well as of the purchase of ropes and buckets, proportionally to his or her share in the structure. A 1346 resolution of the City Council stipulated that if the co-owner of the well refused to participate in its renovation costs, the exclusive ownership of the said well could revert to the townsperson on whose ground it was located and who incurred the main burden of its upkeep.²⁴

Aside from the three above-described wells, non-filled-in and still supplied by the aquifer system: two at the Market Square and one in Kotlarska St., the remaining dozen or so discoveries were made possible thanks to the presence of relics of their stone shaft linings. They were usually discovered during small-scale excavation work, whose scope was limited to sondage or the so-called archaeological supervision carried out in the course of various construction projects. For this reason, any in-depth exploration of those wells was for the most part impossible. Stone wells have been discovered in different parts of the area of the city originally enclosed within defensive walls, on plots delineated during the city charter period, i.e. belonging to tavern keepers – townspeople who enjoyed full privileges. Depending on the territorial range of archaeological studies, mostly limited to a small area or, less often, to entire spaces in the rear sections of old townhouses, archaeologists were able to discover single wells or groups of wells. So far, the largest group of adjacent wells has been unearthed in two blocks, with three wells found in the eastern part of the south block bordering on the Market Square, and another three in the block situated between Pańska St. and city walls, bounded on two sides by two gate streets: Franciszkańska and Piotrowa (currently Bohaterów Getta St.).²⁵

Stone well relics discovered during archaeological sondage in the second half of the 1990s behind the townhouses in the southern frontage of the Market Square and east of Zaulek Świętokrzyski, the passage connecting the Market Square with the site of the former Dominican monastery, were surrounded by the remains of masonry foundations of the rear structures erected on the burghers' plots. The archaeologists were able to uncover filled-in well shafts on the townhouse plots which modern-day numbers 19, 21 and 22. The granite well casings were situated near mediaeval foundation walls of outbuildings. In two cases they adjoined the utility buildings, which implies that they might have formed a single compound, which

²³ APWr., *Akta m. Świdnicy* 115, sheet 32, 57; Goliński M. 2004, p. 76; Sowina U. 2012, p. 193.

²⁴ APWr., *Akta m. Świdnicy* 180, sheet 64v; Goliński M. 2004, p. 78.

²⁵ The burghers' plots located behind townhouses forming the south frontage of the Market Square contained three mediaeval wells situated close to the neighbouring plots, see: Chorowska M., Karst D., Lasota C. 1998, p. 163, Fig. 2.

was probably involved in the broadly-defined brewing activities. The preparation of malt, a foundational ingredient in making beer, played a highly significant part in the process. By analogy with other European beer-producing centres, it is evident that malt-making facilities were the first to become established as separate enterprises.²⁶ In the case of the well in the northeastern part of the block located directly to the south of the Market Square, this assumption has been confirmed both in tax ledgers and *acta municipalia*.²⁷ The well discovered at the back of the townhouse at Rynek 19 in the late 1960s was undoubtedly involved in processing grains, which, in the case of early mediaeval Świdnica, mainly meant barley. Together with the remains of a mediaeval malt house at the back of the house, this water intake was found during architectural and archaeological sondage in the southern block of the development adjoining the Market Square in 1995.²⁸ The insights and the query of mediaeval sources dating to the years in which the said structures were built made it necessary to complete full-scale excavation studies at the site. Archaeological research was intended to determine the exact dimensions of what appeared as a malt house and, as far as possible, to verify the purpose of the facility.²⁹ Relevant work commenced in 1997 thanks to financial support from the General Heritage Conservation Officer and allowed researchers to achieve two main goals. The archaeologists uncovered fragments of the mediaeval establishment and managed to reconstruct its layout: an equilateral trapeze extending southward. The side walls of the malt house were 20.5 m long, whereas its northern and southern gable walls were respectively 5 m and 6 m long.³⁰ Today, only the eastern wall remains, with an approximate height of 5 m and length of 20 m, doubling as a boundary wall separating the area from the plot at Długa 2. It was built from split granite slabs and erratics (fieldstones) layered on mortar made of clay and half-slaked lime. The structure of the wall suggests that the malt house initially had at least two storeys of equal height (2.2 m) covered with beamed ceilings. This is confirmed by the presence of 16 beam pockets for the lower ceiling. As for the upper ceiling, three pockets filled in the early modern period were visible, with the remaining beam pockets covered

²⁶ The oldest mentions of urban malt houses come from: Liège (1281), Wrocław (1305-1307), Lwówek Śląski (1311), Świdnica (1338), Jawor (1369), see: Deckers J. 1970, p. 455, footnote 43; Wiggert F. 1930, p. 31; Tzschoppe G.A, Stenzel G.A. 1832, no. CXIV, p. 490; *Regesten zur Schlesischen Geschichte* 1925, p. 3; Jurek T. 2000, p. 67.

²⁷ APWr., *Akta m. Świdnicy* 235, sheet 71r.; APWr., *Akta m. Świdnicy* 115, sheet 78v.

²⁸ Chorowska M., Karst D., Lasota C. 1998, p. 162; Sowina U. 2012, p. 169, footnote 632.

²⁹ Świdnica's tax ledger of 1379, in the section kept from 1401, states that Jacob Seber, the owner of the plot, agreed to pay tax on a malt house, if and when it was actually built (APWr., *Akta m. Świdnicy* 235, sheet 71r.)

³⁰ Karst D. 1997.

with a layer of plaster or extra masonry elements added in the course of structural modifications. On both levels, slit windows, splayed on the outside, allowed narrow beams of light to enter the malt house. Excavation works revealed a clay floor at the level about 80 cm lower than the surrounding ground (at the time when the establishment was in operation). Remains of an old drying kiln were found in the northern part of the alleged malt house, at the northern and narrower gable wall. The discovery, as well as the significant depression in the lower floor of the annexe, made of compacted soil, and the slit walls letting in light indicate that the building must have served as a malt house in the Middle Ages. The ground level contained a germination floor, where pre-steeped grains were left to sprout, to be later dried on the kiln grating (located in the northern part of the establishment). A Gothic well was found 80 cm from the remains of the foundation of the malt house's northern gable wall.³¹ Stone well casings were also unearthed in close proximity to (west of) the malt house, behind today's townhouses in the southern frontage of the Market Square, with numbers 21 and 22. As mentioned before, the wells were surrounded by mediaeval foundation walls of outhouses in the rear, and the well in the latter plot was directly connected to the walls. The well unearthed at the western boundary of the plot behind the townhouse at no. 22 adjoined the northwestern corner of a small, 4 x 5 m late-Gothic building, which was directly attached to an existing boundary wall. The foundations of the building were built from granite and erratics (fieldstones) bonded with a robust cream-coloured sand and lime mortar. The northwestern corner of the structure was partly based on an older Gothic well with a diameter of 1.1 m and casing thickness 40 to 50 cm, made from granite slabs.³² To the south of the late-Gothic building, extending from its western wall was the aforementioned boundary wall, formed by the walls of Gothic annexes on its both sides. It is likely that one of the walls was built behind the small late-mediaeval structure, possibly forming an integral part of it. The remains of its northwestern corner were discovered within less than 7 m from its rear (southern) wall. The four structures were probably part of a sequence of utility buildings involved in malt production. With the exception of the well situated in the north-western corner of the late Gothic building, this hypothesis is supported by strong evidence such as a 1393 entry in the oldest municipal records, which documents a dispute between Pecze Voyt and Martin Yrwin concerning water running down a chute along malt house walls.³³ Świdnica's *Liber exactionis*, in the section kept from 1401, states that the former probably lived in an tavern keeper's mansion behind today's

³¹ Ibidem.

³² Chorowska M., Karst D., Lasota C. 1998, p. 163, Fig. 2; Chorowska M., Lasota C. 2013, p. 229.

³³ APWr., *Akta m. Świdnicy* 180, sheet 157r.

townhouses at Rynek 21 and 22,³⁴ whereas the latter, a town clerk, inhabited the property located in the western part of the former Primary School No. 1 at Różana 6.³⁵ Both townsmen were neighbours, as their properties were partly adjacent due to a shared rear boundary. If the location of the property belonging to Petcze Voyt was correctly reconstructed and includes the land behind the townhouses at Rynek 21 and 22, this means that the townsman also owned the second Gothic well surrounded by utility buildings, discovered behind the first of the wells. At least one of the mediaeval workshops served as a malt house; it is also likely that two structures were involved in making malt, with two wells supplying water for this purpose. Given the present stage of archaeological research and interpretation of mediaeval written sources, it is difficult to determine the facts with certainty.

To date, the search for traces of artificial water intakes led archaeologists to the second largest well cluster in the block bounded by streets such as Pańska, Bohaterów Getta (formerly Piotrowa), Marii Konopnickiej (formerly “podwale,” a street running along the city walls) and Franciszkańska (formerly Kapturowa). As the three wells were situated in a compact, dense and archaeologically well-explored development over a narrow strip of land, they will be described in detail in a later section of the present discussion concerning hydrotechnical devices inside townhouses.

As for the wells situated in the yards on burgher plots and supplying water for consecutive stages of beer production, two pairs of each have been so far discovered in three clusters west of the Market Square in Świdnica. One was located at the back of the market’s western frontage, and two other in Kotlarska and Grodzka streets leading to the castle. Two wells near the Market Square were found at the rear of the townhouses at Rynek 32 and 34, with the former located in the southern part of a burgher plot, and the latter at its northern boundary. An artificial drawn water intake, originally situated in the yard of the house whose location corresponds to today’s plot no. 32, was later found in its cellar. The property initially belonged to Johannes Probischayn, many times councillor and lay juror, who ran a malt house in its rear section. Nyclas Walkman, Probischayn’s neighbour to the south, residing in the location of today’s townhouse at Rynek 31, must have owned the same type of establishment. Świdnica’s first *acta municipalis* dated to late 1378/early 1379 mentions a shared boundary wall from the Market Square to the malt house of the latter townsman and a clogged pipe discharging waste water to the sewer (*ayczucht*).³⁶ The well was located next to the wall separating the two

³⁴ APWr., *Akta m. Świdnicy* 235, sheet 71r.

³⁵ He or, rather, his son (with the same name) is mentioned in the tax ledger of “Year 1471,” see: APWr., *Akta m. Świdnicy* 179, p. 67; Goliński M., Maliniak J. 2007, p. 246.

³⁶ APWr., *Akta m. Świdnicy* 115, sheet 27v; Goliński M. 2003, p. 240 et al.

properties.³⁷ As the house was extended in the late 14th century as part of a mass construction campaign in Świdnica and wood and clay (wattle and daub) front houses were replaced by masonry, multi-storey developments, the water source was located in the rear wing of the new townhouse.³⁸ The second well discovered in the course of archaeological and architectural studies in the western block adjoining the Market Square was situated on the plot of building no. 34. The patrician Zachinkirche family became the first owners of the property in the second half of the 14th century. A stone well casing was exposed further down the plot on its northern side, whereas its southern side originally contained a stone annexe situated 12 m from the townhouse's rear façade.³⁹ The second cluster of two mediaeval wells was found in the rear of the southern frontage of Kotlarska St. In addition to the previously detailed well in the rear part of the former burgher house no. 19, currently still supplied from an aquifer, a stone casing of the underground source was unearthed in the courtyard of the house at Kotlarska 3. A filled-in mediaeval well was placed at the western boundary of the property and the masonry rim of the well shaft was approx. 2 m in diameter.⁴⁰ More recently, discoveries of artificial water intakes from the early ages of the chartered city of Świdnica were made during archaeological studies conducted in 2024 at the back of the townhouses forming the northern frontage of Grodzka St. The studies revealed stone casings of two mediaeval wells. One of them has a wealth of historical context related to the Franciscan Order,⁴¹ which was involved in the creation of urban space and which in the 1240s received a plot of land in the northern part of the city, "in the woods" (*im Waldis*). Hence, the area was originally not subdivided. In 1249, the friars received support for their construction undertakings from the Vatican, thanks to which we have the first credible confirmation of Świdnica's existence.⁴² The Franciscans made beer for their own purposes, conceivably due to the absence of their own malt house and brewery. In 1474, Friars Minor transferred the ownership of a part of their garden to Fabian Sachenkirch – owner of the property in the northern frontage of Grodzka St. – and obliged him to build a brewery so that they could use its services.⁴³ Apparently, the agreement was not executed, since a similar transaction was concluded by the friars 40 years later with Anthonius Kistener, who lived on the above-mentioned property. At that point, the Franciscans also included the conditions of the renovation and shared use of

³⁷ Chorowska M., Lasota C. 2000, p. 357, Fig. 10; Chorowska M., Lasota C. 2013, p. 77.

³⁸ Chorowska M., Lasota C. 2013, p. 261.

³⁹ *Ibidem*, p. 268.

⁴⁰ *Ibidem*, p. 338.

⁴¹ Karst D. 2001.

⁴² *SUB*, vol. 2, no. 373, p. 236.

⁴³ Schubert H. 1911, p. 165.

the brewing house. Both local patricians lived in a townhouse located at modern-day Grodzka 14.⁴⁴ Without doubt, the infrastructure of the brewery jointly used by the townsmen and the friars also included the well, recently uncovered during archaeological works in the courtyards of the townhouses forming the northern section of Grodzka St.⁴⁵ The cylindrical stone casing of the well was near the eastern boundary of the plot on which the townhouse at Grodzka 14 was built and which neighboured on the plot at Grodzka 12. The placement of historical wells near the neighbour's walls was typical of mediaeval Świdnica, since it enabled the owners of both properties to draw water on terms defined by many partners involved in the construction of the water intake. As already mentioned, access to water was usually unlimited in the brewing season. The well discovered next to the rear wall of the townhouse at Grodzka 14 was built with the use of technology typical of mediaeval Świdnica. Its shaft was lined with split granite slabs with a small addition of erratics, bound together with a sand, clay and lime mortar. An arcade stretched above this artificial water intake, extending from the eastern wall of the house at Grodzka 14 and its rear façade. This arch partly supported the first floor of a utility building. In the early modern period, there were wooden stairs leading to the building from stone slabs placed on an already defunct well. The annexe of the townhouse at Grodzka 14 is hugely interesting and should become subject of architectural research. Although it underwent a radical conversion in the Baroque period, together with the front house, its basic structure is probably mediaeval. The short distance between the well and the utility building implies that the latter served as a brewery, and one which was to be built on the plot belonging in the second half of the 15th century to Fabian Sachenkirch, a six-time mayor, councillor and lay juror, under the agreement he had concluded with the Franciscans. The brewing house must have come into being during the tenure of his successor Antoni Kistener since, as already mentioned, it was he who had undertaken to renovate the facility in the agreement with the friars. The annexe seems the most logical and plausible location of the brewery at the back of the building at Grodzka 14, positioned partly above the well, at the same time forming the east wing of the townhouse. An 1830 map of Świdnica's water supply network still shows the recently discovered mediaeval well behind today's townhouse at Grodzka 14, albeit with a different number of the front building (17). The property with the supposed brewery in its rear section bordered to the north with another estate where

⁴⁴ Wąs G. 2000, p. 57. Both owners, i.e. Fabianus Sachenkirch and Anthonius Kestener, are mentioned in a tax ledger of "1471"; they occupied the northern frontage of Grodzka St. and, as implied by urban planning analyses, most likely the house at the then number 14, see: APWr., *Akta m. Świdnicy*, 179, p. 7.

⁴⁵ Karst D. 2001.

currently the townhouse at Grodzka 16 is located. According to 14th-century fiscal sources, the latter paid property tax together with another burgher plot situated to the north, so both properties must have been connected. At that time, the same fiscal documents evidenced the existence of a malt house in the rear part of both connected plots. It is likely that another well, discovered at the back of the Grodzka 18 townhouse, was linked to the malting establishment. The upper ring of the well case was uncovered in 2024. It was constructed from slabs of split granite, with a small addition of erratics, bonded by sand, clay and lime mortar. The unearthed vestiges of the well were found at the rear entrance to a ground-floor room of the building, and the outer rim of its casing was situated around 1.20 m from the building's rear façade. The inner diameter of the casing was approx. 2.1 m. Initially, the well shaft was equipped with other objects enabling water to be drawn and protecting the structure from weather conditions. The above-ground part of the well probably had a roofed masonry structure with a pulley or winch around which a bucket chain or rope was wound. This is confirmed by the fragments of two symmetrical pillars on the south side of the well casing displaying remnants of the brick arch, as well as the trace of the arch revealed in the northwestern part of the well. It is therefore possible that the well could be accessed from the four arcades stretching overhead. From the above, the structure might have been topped by some kind of roof. The well was probably built before 1379, which was the year of the tax census, as both estates at today's Grodzka 16 and 18 jointly paid property tax, including tax on the malt house. At that time, the two plots were owned by Hannos Czacheris.⁴⁶ However, the ownership changed in the 15th century, as thereafter taxes were collected separately for land under today's townhouses at numbers 16 and 18.⁴⁷ The well with the stone casing probably supplied water not only for the malt house but also the brewery, since the owner of the plot on which the modern day house at Grodzka 18 was built, like his successors, benefited from raising the establishment's output limit thanks to the upward extension of the building so as to receive the privilege to make "additional brews" from the city council. The practice became common after 1379, with tavern keepers, fully entitled citizens of Świdnica, eager to seize the opportunity. In the 18th century, both brick townhouses were reconnected in a Baroque-style conversion, during which a shared front façade and a gate opening were created. The well, like the one in the annexe of townhouse no. 14, can still be found on the map of Świdnica's water supply and intake network dated to ca. 1830, on which today's townhouse at no. 18 was marked with no. 15.

⁴⁶ APWr., *Akta m. Świdnicy* 179, p. 7; APWr. *Akta m. Świdnicy* 235, sheet 87r; Chorowska M., Lasota C. 2013, p. 363.

⁴⁷ Chorowska M., Lasota C. 2013, p. 361.

Archaeological research conducted in the yard on the northern side of today's Kazimierza Pułaskiego St. and the western side of the currently non-existent northern frontage of Siostrzana St. supplied individual examples of private wells from the mediaeval period.⁴⁸ Thanks to available research documentation, the first of these finds can be discussed in more detail. What is today's Kazimierza Pułaskiego St. was originally named Wysoka St. and constituted a part of the famous trade route *Via Regia*. The well was discovered north of the trail, at the boundary between the plots formerly belonging to non-surviving townhouses at no. 31 and 33. It had stone casing of maximum thickness 30 cm, an outer diameter of about 2.5 m and was built from small granite slabs bonded with clay. To the north, along the line dissecting the well's diameter, a Gothic wall was built, forming the boundary between the two plots. During the Baroque, the well served as a support for the annexe's foundations.⁴⁹ Meanwhile, in the early modern period behind the townhouse at no. 31, in the rear section of the plot, there was a brewery with a brick stove placed under the brew kettle. The foundation of the masonry insulation of the equipment, together with the remains of the firing chamber, were discovered in the course of the research mentioned above.⁵⁰ Whether the brewing house had existed in that location already in the Middle Ages is unknown; therefore, it is not possible to determine with certainty if the well was used exclusively for beer making purposes.

A different category of artificial water intakes built by tavern keepers includes wells integrated into their households. This was a consequence of a series of construction operations taking place in Świdnica at the turn of the 15th century, when multi-storey, masonry townhouses displaced wattle-and-daub front houses from the city's landscape. Constructed mainly from stone, burgher houses were extended not only vertically but also horizontally, further inward on the burgher plot. As a result, rear bays or wings by which the houses were extended were built over immovable objects (such as wells) previously erected on the plot. Recent archaeological studies on Świdnica's past have revealed a number of such wells, surrounded by foundations and walls of residential buildings. The largest cluster of these structures was recorded when analysing the development originally bounded by the streets today called Pańska, Bohaterów Getta (formerly Piotrowa), Marii Konopnickiej (formerly "podwale," a street running along the city walls) and Franciszkańska. A total of three wells were discovered within the high-density development in this

⁴⁸ *Atlas Historyczny Miast Polskich* 2008, Table 2: *Średniowieczne i nowożytnie stanowiska archeologiczne w Świdnicy*.

⁴⁹ Chorowska M., Czerner R., Karst D., Lasota C. 1996.

⁵⁰ Karst D. 2015, p. 36, Fig. 23.

refined enclave on the map of mediaeval Świdnica, inhabited by representatives of the local nobility and Silesian clergy. One of these wells was found in the rear bay of a large house facing Piotrowa St. (currently Bohaterów Getta St.), which led to the city gates. According to the fiscal census, conducted from 1401, the building served as a bath house (*domo balnei*), so the well must have provided it with water.⁵¹ Making beer was probably a side activity of the house extended in the late Gothic period and occupying the entire area of the property, as confirmed by large cellar chambers and a section of a ramp – traces of infrastructure required for lagering beer barrels. The other two wells were uncovered at the street running along the city walls (today's Marii Konopnickiej Street). Despite its density and compactness, this zone of the block described above preserved typical characteristics of the rear section of a burgher plot, as representative townhouses faced Pańska Street, and their annexes were positioned along a more peripheral Marii Konopnickiej Street, which ran parallel to Pańska. One of the annexes, situated to the west, was enclosed with a wall separating the plot from Podwale. A conclusion which can be drawn from the analysis of tax censuses and an attempt to match mediaeval owners to facts determined in the course of archaeological research is that the middle well bore can be linked to the malt house of knight Ulrich Schaff at Pańska 13.⁵² The last and the westmost of the well casings, with a unique, rectangular footprint, was located on property originally belonging the abbot of the Cistercian Monastery from Krzeszów.⁵³ Perhaps it was not employed in brewing operations, and its non-standard form and position halfway along the boundary wall, in the vicinity of the city walls, implies that the structure was converted into a latrine. However, no definite conclusions can be drawn on this subject due to the limited scope of archaeological research.

Last discovered wells identified to date in the archaeological studies in the area of chartered Świdnica and included within the footprint of mediaeval townhouses include water intakes discovered at Rynek 32 and Długa 48. A well next to the Market Square was discovered at the back of the townhouse at Rynek 32, near the neighbouring burgher plot belonging to the house at Rynek 31, which bordered the former property to the south.⁵⁴ The property initially belonged to Johannes Probischayn, many times councillor and lay juror, who ran a malt house at the back. The same type of establishment must have also belonged to his southern neighbour Niclas Walkman, since Świdnica's *acta municipalis* dated to 1378/1379

⁵¹ APWr., *Acta m. Świdnicy* 235, sheet 77v.

⁵² *Ibidem*, sheet 77r.

⁵³ *Ibidem*.

⁵⁴ Chorowska M., Lasota C. 2000, p. 357, Fig. 10; Chorowska M., Lasota C. 2013, p. 77.

mentions a shared boundary wall extending from the Market Square to the malt house of the latter townsman and a clogged pipe discharging waste water to the sewer (*ayczucht*).⁵⁵ An unearthed well, which during the 14th century extension of the house found itself in the cellar of the rear wing, might have also been jointly used by the two neighbours.⁵⁶ Initially, it was located in the yard, near the eastern wall on the plot boundary. Later, in the late-Gothic period (the first half of the 15th century), as wattle-and-daub houses gave way to multi-storey masonry buildings, the well was included in the long bay of what back then was a two-bay townhouse extended deeper into the parcel.⁵⁷ This location of the well is more proof that most breweries in mediaeval Świdnica were placed in front houses.

In comparison to other mediaeval European cities, the wells in Świdnica were very deep, which prevented water contamination from local outhouse infrastructure such as sewers, toilets, workshops, etc. Clean water, drawn from deep well shafts, dug out partly in granite foundation and enclosed inside stone casing, also made from split granite slabs, was significant, if not crucial, for the success of the local brewing craft.

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⁵⁵ APWr., *Akta m. Świdnicy* 115, sheet 27v; Goliński M. 2003, p. 240 et seq.

⁵⁶ Chorowska M., Lasota C. 2013, p. 261.

⁵⁷ Burnita J., Karst D., Lasota C. 1999, p. 1, Fig. 1, photograph 4.

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Abstract

For centuries, water and its quality played a decisive role in both settlement patterns and beer production. In the area of present-day Świdnica, favourable conditions were created by the Bystrzyca River and its numerous tributaries, along which watermills operated from the early Middle Ages. This situation changed after the foundation of the chartered city in the first half of the 13th century on a post-glacial elevation and the Bystrzyca River terrace. In the late 13th century, a ducal castle and defensive walls were erected there. The city's location required inhabitants to rely on deep groundwater sources, situated at depths of 15-16 m, as confirmed by 20th-century hydrogeological research. Founded under Magdeburg law, Świdnica developed from the outset as a centre of brewing, which rapidly assumed an almost industrial scale. This was enabled by legal privileges associated with the medieval tavern right (*ius tabernae*), commonly granted during the 13th-century colonisation process. Plots assigned to early settlers, known as "taverns," supported the growth of commercial brewing. Due to the granite bedrock, wells had to be partially cut into rock and lined with stone. Archaeological excavations have identified over a dozen such wells, usually located at plot boundaries to allow shared access. Some were associated with breweries and malt houses, which initially operated within residential buildings of medieval Świdnica.

Keywords: groundwater sources, wells, Świdnica, tavern keepers, mediaeval brewing, malt houses, breweries, archaeological research