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The second left-bank castle in Wrocław in the light of the latest archaeological and architectural research

Abstract. The paper presents the results of archaeological and architectural research on the premises of the former Babiński Hospital at John Paul II Square (plac Jana Pawła II) in Wrocław (Poland), during which the relics of the unfinished second left-bank castle, dating back to the end of the 13th century, were uncovered.

Since the 17th century there has been a hypothesis about the existence of a second, never-completed left-bank castle, situated on the site of the later building of St. Nicholas' Arsenal. It was widely discussed in academic papers from the 1940s, as well as by Polish researchers after World War II. This castle was most often associated with the person of Prince Henry IV Probus. The first archaeological investigations which allowed for its preliminary confirmation were carried out in 1979, 1981 and 1992–1994 by a team led by Dr. Jerzy Romanow. Their results, however, did not allow a definitive solution to the problem.

Another opportunity to verify the existing findings was the research conducted in 2015–2020 by a team led by the Authors. Over the course of this research, numerous architectural relics were found which allow us to reconstruct with high probability both the planned outline of the foundation and the degree of advancement of construction works at the time of their abandonment. Among other things, a fragment of the stripped perimeter wall was discovered, originally brought to its full height (which refutes the theory that the castle never left any foundations), as well as a moat and perfectly preserved elements of a three-span bridge. Earlier hypotheses, that the square tower of the Arsenal was originally part of the castle complex, were proved and relics interpreted as the foundations of a second, similar tower in the north-eastern part of the complex have also been found. The result of the research was also verification of the reconstruction attempt made by Jerzy Romanow and a new interpretation of some of the results of his research. The results also shed new light on the chronology of the formation of elements of St. Nicholas' Arsenal and the development of Wrocław's medieval city fortifications.

Keywords: Wrocław, Henryk Probus, Middle Ages, archaeology, architecture, castle.

The castles of Wrocław have long been an important object of interest of researchers' interest. So far two of them have been well recognized in previous works. The first is the right-bank castle on Ostrów Tumski, existing most probably from the 10th or the turn of the 10th and 11th centuries (Buśko 2005, p. 180). There is, admittedly, still a field for research both in terms of the chronology of the complex (Małachowicz 1994, p. 33) and its layout (Chorowska 2003, p. 48); the general features of this foundation are well known and do not arouse much controversy. The last of the Silesian rulers to reside here was Henryk IV Probus, Duke of Wrocław between 1270 and 1290, who is particularly relevant from the point of view of this paper. Finally, before the mid-14th century, the castle was handed over to the Holy Cross Chapter (Chorowska 2017, p. 926).

The latter is the left-bank castle, whose foundation dates to the beginning of the 13th century and is linked to the person of Duke Henry I the Bearded (Małachowicz 1994, p. 8). Małgorzata Chorowska gives the beginnings of this investment more precisely, pointing to the 1330s (Chorowska 2017, s. 926). Located on princely grounds, roughly corresponding to the location of today's main building of the University of Wrocław, the manor house was most likely burnt down during the Tartar invasion in 1241. In the following centuries it was modified and rebuilt many times and eventually lost its importance (Małachowicz 1994, p. 10–11). In 1659 the castle grounds were handed over to the Jesuits, who began demolition shortly afterwards. The complex was studied from the mid 1950s by Marian Morelowski, Józef Kaźmierczyk, Edmund Małachowicz, Jerzy Rozpędowski and Czesław Lasota, and was quite well identified in the course of this work. A detailed description of the excavations carried out at this site is provided by Małgorzata Chorowska (2017, p. 927).

The hypothesis related to the existence, or at least planning, of a second left-bank castle (the third one in general) in the area of the present St. Nicholas' Arsenal appeared as early as in the 17th century. The first author to mention this was Mikołaj Pol, quoted by Mateusz Goliński (1997, p. 182), who looked for the seat of the Teutonic Knights in this place related to the nearby church of St. Barbara (Goliński 1997, p. 182). The location of the defensive structure in this place was also indicated by Kurt Bimler, Marian Morelowski, Marcin Bukowski and Jerzy Rozpędowski (Bimler 1940; Morelowski 1954; Bukowski 1958; Rozpędowski 1978, pp. 146–147). This hypothesis is also confirmed by Marta Młynarska-Kaletynowa on the basis of source texts, as well as by Rafał Eysmontt (Młynarska-Kaletynowa 1986, p. 119; Eysmontt 1995, p. 88; 2009, pp. 104, 573). The most significant discoveries connected with this object are connected with the research conducted at this site by J. Romanow, which began in 1979 and was continued intermittently in 1981 and 1992–1994 (Romanow 1979; Informator 1980; 1982; Romanow, Piwko 1992). They resulted in the discovery that the entire southern wall and part of the eastern wall of the southern wing of the Arsenal was founded on a much earlier wall with

a slightly different course. According to the results of this research, the discovered walls could not have been designed as the foundations of the Arsenal, but were part of an earlier building. This was supported by several arguments. These were mainly: the considerable width varying between 2.25 and 2.95 m, and the fact that the uncovered wall runs beyond the contours of the eastern and western walls of the Arsenal (Informator 1980). The continuation of the research in 1981 led to the discovery of buttresses reminiscent of a bridge or culvert structure, situated in the line of the curtain wall, south of the south-west corner of the Arsenal. A comparison was also made between the foundation level of the newly discovered elements and the curtain wall on the inner side of the same corner. The newly discovered elements were founded much deeper. A trench was also established from the north-eastern corner of the Arsenal to the building of the so-called old pharmacy, where along the entire length of the curtain wall of the second circuit a brick wall was discovered, forming an offset 80 cm wide, with the total width of the joint approximately 2.30 m. Another 2.95 m-wide fragment was discovered against the southern wall of the pharmacy building (Informator 1982). In addition, in the south-eastern corner of the Arsenal two niches with toothing were discovered (one of them was exposed), and in the south-western corner – toothing directed to the interior of the element. Relics revealed during the works were interpreted as elements of an unfinished castle-type investment, broadly dated between 1275 and 1350 (Fig. 1) (Informator 1980). However, the results of the research conducted at that time

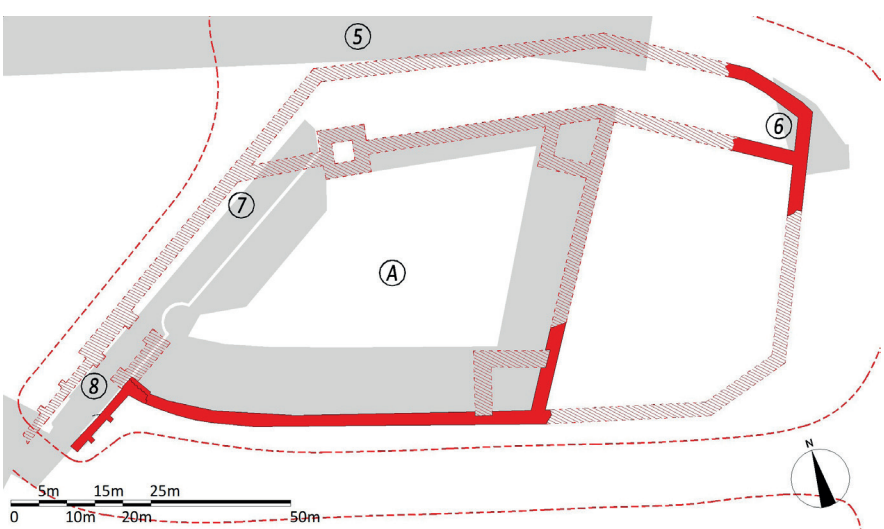

Fig. 1. Wrocław. Research findings (red) and hypotheses (dashed red) of J. Romanow against the background of contemporary buildings: 5–8 – buildings of the former hospital, A – St. Nicholas' Arsenal (after Małachowicz 1994; development by P. Kmiecik)

were insufficient to confirm the hypothesis definitively. On their basis, however, an attempt at reconstruction was made, later cited by Edmund Małachowicz (1994, p. 147). It is also mentioned by Mateusz Goliński, Jerzy Piekalski and Rafał Eysmontt (Goliński 1997, p. 182, Piekalski 1999, p. 207; Eysmontt 2009, p. 573). According to J. Romanow, the square tower of the Arsenal is also part of the earlier foundation. He interpreted niches with toothing in the south-west corner as part of a corner tower and assumed that a similar one could have been located in the north-east corner. In such a layout of the buildings, Roland Mruczek, Mariusz Caban and Tomasz Kastek see a similarity to the Wrocław castles of Henry IV Probus in Ostrów Tumski and the left-bank castle of Henry III, as well as references to the castles in Poznań and Opole (Mruczek, Caban, Kastek 2015, p. 71). A plan showing the location of all the above-mentioned facilities in the area of today's city was published in the 1990s by Edmund Małachowicz and detailed by Janusz Badura and Tomasz Kastek (Małachowicz 1994, p. 23; Badura, Kastek 2018, p. 154, Fig. 9). However, it is only the recent archaeological and architectural research that allows us to take a closer look at the last of these buildings and critically verify the earlier research and hypotheses.

Research area

The area of the former Babiński Hospital is one saturated with facilities important for the history and architecture of the city, especially in terms of defensive structures. Fortifications will be an extremely important element for the content of the paper, so it is worth taking a closer look at them. Around the middle of the 13th century the construction of the first Wrocław city walls began. They already existed for certain between 1261 and 1274 (Golinski 1987; Kastek 2019). The wall of the first circuit built of brick was characterised by a thickness of about 3 m and a height of 6 to 8 m. It was surrounded from the outside by a moat, the route of which roughly coincides with today's Kazimierza Wielkiego and Nowy Świat Streets. However, the area delimited by the ring of fortifications soon turned out to be insufficient and, at the turn of the 13th and 14th centuries, the construction of a new line of city walls began, significantly enlarging the city's area from the south and west (Goliński 1987). The construction works were completed around 1351. Compared to the walls of the first circuit, they were much narrower (about 1.8 m) and slightly higher (Przyłęcki 1970). A fragment of this line was the oldest element of the discussed research area identified until the beginning of the described research. In the northern part of the plot, it limited the area from the east and south, and in the southern part it ran through it. Originally, it was the entire section between one of the main city gates, St. Nicholas' Gate, and the fortifications of the water gate and the culvert of the first city moat to the Odra River. In

this area the investigated site directly adjoins the area originally covered by the previously mentioned city walls of the first circuit and the moat surrounding them. Only a fragment of fortifications of the second circuit with one shell tower and a corner square tower has survived to our times, and in the 15th century it was incorporated into the St. Nicholas' Arsenal complex (Bukowski 1974; Burak 2012). Both the Arsenal in general and this part, which is extremely important from the point of view of the conducted research, have already been analysed many times, the last time being between 2012 and 2013, when an attempt was made to identify and stratify the complex (Mruczek, Caban, Kastek 2015). In the second half of the 15th century, another line of city fortifications was also built – moved about 10 m outside the city wall. It is the roundel fortification system (Małachowicz 1975). Another element built in the area in question was All Saints' Hospital, which was built in the first third of the 16th century (Wójtowicz 2008). In 1544, the oldest bastion in Wrocław was built in this area, originally called the Great Bastion, and later the Tenaille Basstion (Fig. 2) (Małachowicz 1981, p. 72). The entire defence system was later rebuilt and modernized many times (Podruczny 2009; Kolouszek 2014). In the 18th century, the casemate of St. Barbara and the accompanying barracks (already located outside the discussed area) was also rebuilt (Podruczny 2009, pp. 45, 91). As a result of the Napoleonic Wars, by the decision of the French conquerors of the city in 1807, most of the above-mentioned military facilities were destroyed, and the resulting vast area of more than 2.5 ha was developed by other hospital facilities for the next two centuries (Wójtowicz 2008). After World War II, All Saints' Hospital changed its name to Babiński and functioned continuously until 2007. In 2015, archaeological and architectural research began there under the supervision of Piotr Kmiecik and Robert Szwed.

From the point of view of this paper, the attempt to recreate the historical geographical layout of the area in question, made by J. Badura and T. Kastek (2018), is also extremely important. Based on their own research and the analysis of archival plans, the authors established the course of the historical meander of the Odra River, the eastern part of which ran along the south-eastern border of the analysed area. This is also confirmed by R. Eysmontt who claims that the moat of the medieval city walls' second circuit ran along the line of the old river bed (Eysmontt 2009, p. 573). This means that, during the time of the functioning of the first line of the city's defensive walls, between the aforementioned meander and the moat of the first perimeter of fortifications, there was a headland about 100 to 150 m wide and close to 250 m long, shown in Figure 3. Most likely, the terrain at this site was also slightly elevated compared to the neighbouring areas (Badura, Kastek 2018, p. 139). Thus, it was a place naturally conducive to defence and relatively easy to fortify further. At the same time, the location of a defensive structure there could significantly increase the city's defensive capabilities, but also provide the ruler of this facility with perfect control over the city.

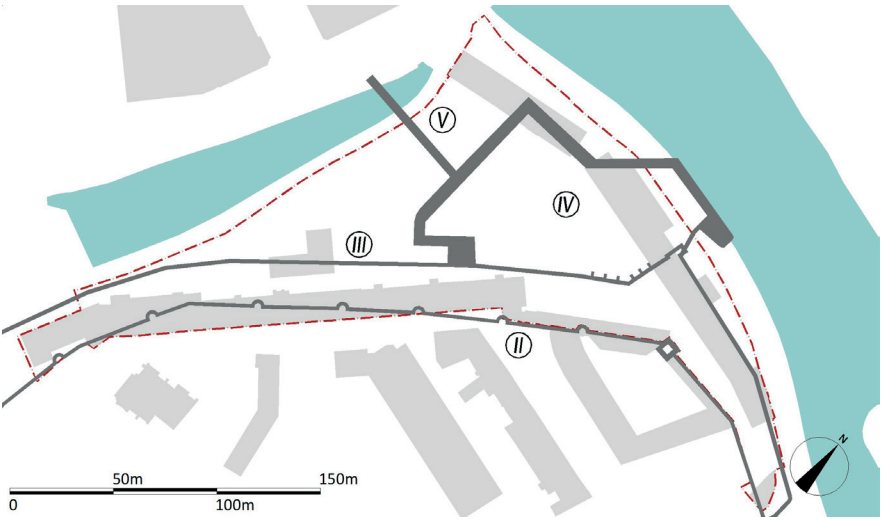

Fig. 2. Wrocław. Elements of fortification system in the analysed area discussed in the paper. II – second perimeter (outer) of city walls, III – roundel fortifications, IV – Tenaille Bastion, V – cofferdam. In the background, contemporary building arrangement (development by P. Kmiecik)

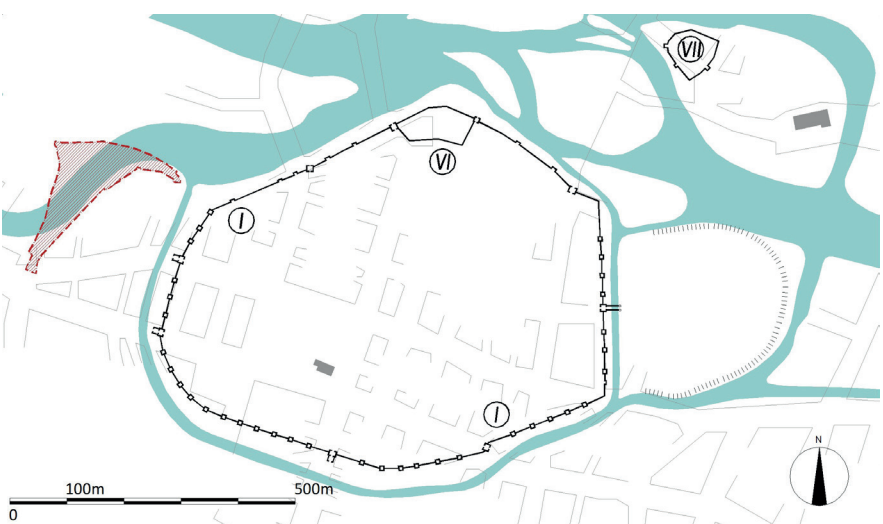

Fig. 3. Wrocław. Location of the analysed area in relation to the first line (inner) city walls (I), around the 2nd half of the 13th century. Other designations: VI – left-bank castl, VII – right-bank castle on Ostrów Tumski. In the background, contemporary building arrangement (development by P. Kmiecik)

The research

The possibility of continuing the research started by J. Romanow appeared in 2015, on the occasion of advance archaeological and architectural research carried out on the site of the former Babiński Hospital at John Paul II Square (Plac Jana Pawła II) in Wrocław. Several research tasks have been assigned throughout the area. The north-eastern part of the site in question adjoins the western wing of the Arsenal, directly touching the area previously explored by J. Romanow. The original goal in this fragment was to identify a section of the 14th-century city fortifications (the second line of the city's defensive walls), along with the corner square tower of the Arsenal and the shell tower incorporated into its area. The second important area was the research under the so-called 'Old Pharmacy', which is the later archive of Babinski Hospital (hereinafter referred to as building 6). In this case, the original goal was to identify the course of the curtain of the bastion fortifications, the second line of defensive walls and to find the relics of the water-gate tower. The most important document enabling the recognition of the studied area became the plan of the Barthel Weiner's dated 1562 (Weiner 1929). It depicts the area of interest to the present research, already occupied by St. Nicholas' Arsenal, showing the arched curve of its southern wing at the junction with the curtain of the city wal (Fig. 4). No passage or gate located in the southern wall of this wing is indicated on the plan. The north-western corner tower of the Arsenal is also clearly visible, situated in the line of the defensive walls at an unusual angle and very different in form from almost all the other towers of this fortification line. The entrance marked in its south-eastern wall is also clearly visible. Only the water-gate tower, located in the line of defensive walls as the next one towards the east, shows some similarity to it. From the analysis of the plan, it can be concluded that these are square-plan towers, covered with hipped roofs. The corner tower is not much higher than the coping and the water-gate tower is marked much higher. The section of the wall between those two towers, unlike the adjacent ones, was not provided with hoardings. The water-gate tower appears in a much later source, in a drawing by Friedrich B. Wehrner, showing the perspective of today's Cieszyński Street (Fig. 5) (Wehrner 1755, p. 378). One can get the impression that it is at least one storey lower than in B. Weiner's plan. The former All Saints Hospital was established in 1527 (construction started a year earlier) in the area of the old shooting range, just behind the second line of the city's defensive walls (Wójtowicz 2008, p. 5). Expanded in later years, it finally took over the area adjacent to the north and west wings of the Arsenal and a part of the defensive walls between the Arsenal and St. Nicholas' Gate, together with the St. Barbara casemate, dating from the late 18th century, and the area after the Tenaille Bastion, demolished in 1812 (Fig. 6). Three elements are particularly important for this study. The first is until recently dated after 1802, the building of the so-called Old Pharmacy (building no. 6). Research conducted

Fig. 4.
Wrocław. A fragment of the plan of the B. Weiners showing the area in question (after Weiner 1929)

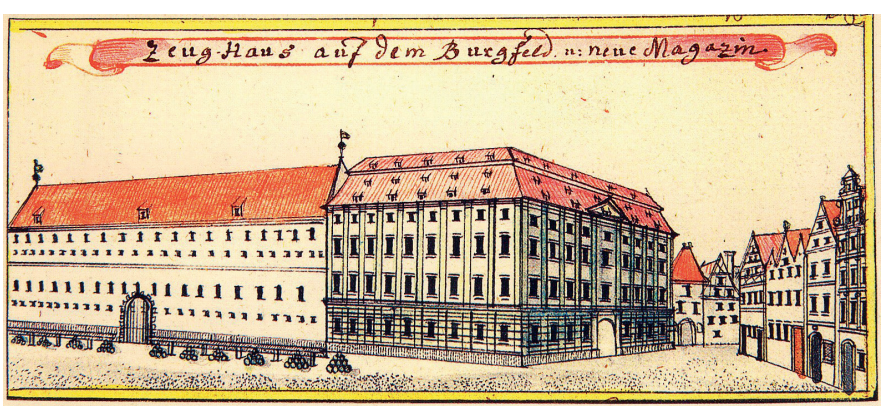

Fig. 5. Wrocław. South wing of the Arsenal according to a drawing by F. B. Wehrner. On the right, deep in today's Cieszynska Street, one can see the tower of the water gate (after Wehrner 1755)

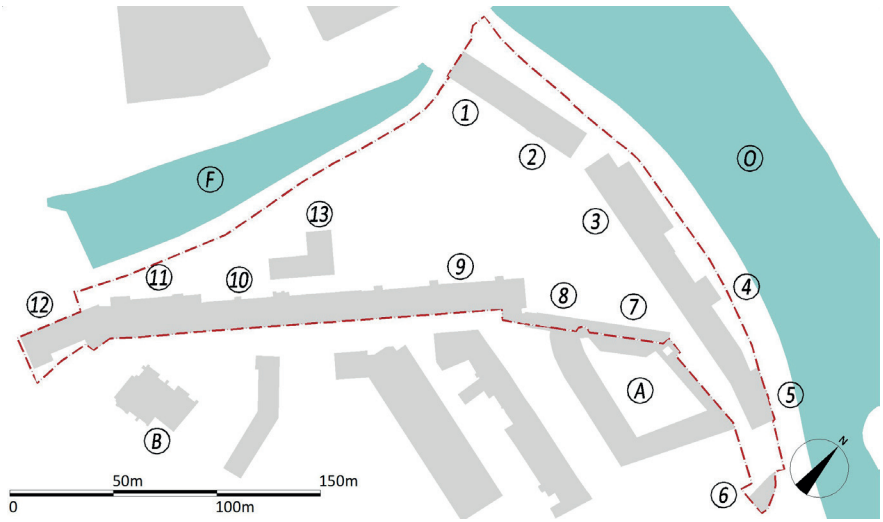

Fig. 6. Wrocław. The area of the former Babinski Hospital with its immediate surroundings. 1–13 – hospital buildings, A – St. Nicholas' Arsenal, B – former St. Barbara's church, O – Oder river, F – city moat (development by P. Kmiecik)

recently by a team led by P. Kmiecik and R. Szwed indicates a much earlier date of construction. Two others are the building of the Johann Christian Hickert Foundation (hereinafter building no. 7) from around 1800 and the neighbouring farm building dating back to the 18th century (hereinafter building 8) (Wójtowicz 2008, pp. 41–43). The first of them is located in the easternmost corner of the hospital site, the latter two adjoining from the west to the west wing of the Arsenal, from the corner-square tower to the preserved fragment of the curtain of the city walls south of the south-west corner of the building. The so-called 'building with a clock' (hereinafter referred to as building 9), dating from the years 1821–1823 (Wójtowicz 2008, p. 45). The archaeological and architectural research on that which forms the basis of the paper was carried out inside the first three buildings, to a small extent at the Old Pharmacy building, and also after the demolition of the 'building with a clock' (Kleszcz, Kmiecik 2018).

The most important works were carried out inside building 8. After cleaning the wall shared with the Arsenal of layers of plaster, three significantly interesting elements were exposed. The first of these was a trace of a scraped wall of considerable thickness, with a fault interpreted as a sidewalk and remnants of battlements (i.e. originally full height). It was originally perpendicular to the existing wall of the Arsenal (which was also the curtain of the second perimeter of the city walls). On the north side, the curtain adjoins the scraped wall, similarly to the upper parts on the south side. In the lower part, you can see a scraped masonry cornice in a roller

arrangement, below which there is a bonded wall with a scraped one, so it can be assumed that it comes from the same construction phase (Kąsinowski 1970, p. 59). In the southern part, another handcuffed element was discovered, visible on the wall surface as a rectangle measuring 90 x 130 cm. In view of these observations, it was decided to excavate a wide trench at this location, numbered 8.III. Due to the enormous scope of the excavations, it was decided that the trenches to be excavated in the open air would be marked with Roman numerals from I to XLI, while the trenches to be excavated inside the buildings would be marked using two parts, with the first part being the Arabic building number and the second part being the Roman trench number. Inside the buildings no. 7 and no. 8, to the north-east of the trench no. 8.III, five exploratory trenches were established, thanks to which the method and level of foundations of the 14th-century curtain of the city wall, as well as the shell tower (trench no. 8.II) were inspected.

Another wide trench, marked as 7.I, was established inside building no. 7, at the western junction of the city-wall curtain with the square tower of the Arsenal. In order to check the type of connection, an exposure in the wall was also made at a height of approx. 1.5 m from the building's floor level. Slightly higher, a similar exposure was also made at the opposite, eastern joint of the Arsenal wall with the tower.

Due to the lack of technical possibilities, no exploratory trenches were made along the wall of the northern wing of the Arsenal. The visible wall itself seems to be well recognized (Mruczek, Caban, Kastek 2015 p. 73), but conducting excavations along it still seems to be a necessary element to close the research at the discussed area and to clarify the doubts already raised in the aforementioned paper.

Subsequent trenches were set around building no. 6. These included a wide trench, no. XL, located near the north-west corner of the building, and a relatively small trench, no. XLI, in front of the building's southern wall due to the density of installation networks. The next three wide trenches, no. 6.I, 6.II and 6.III, were set inside building no. 6.

The last key element for this study was a very large excavation made after the demolition of building no. 9. There were trenches no. XXXII and XXXVII in it. Their main goal was to find the line of bastion fortifications and the southern shoulder of the Tenaille bastion. However, much older relics were also discovered in trench no. XXXVII.

The results

The largest accumulation of relics significant from the point of view of this text was discovered in the aforementioned trench no. 8.III. Below the last usable building level, relics of the original brick floor of the building have been unveiled. Below it, on the extension of the previously discussed trace of the scraped wall, a fragment

of a arched, brick wall with toothing, an inner face with a vertical bond, and an external (southern) face with vertical deviation of an angle of approximately 7 degrees, was found (Fig. 7). It was built as solid-finger, hand-made, brick masonry measuring approximately 29 x 14 x 9 cm in a Flemish bond. A lime-sand, sand-grey, strong mortar with a large amount of lime binder was used for the construction. It also contained a noticeable amount of the so-called lime lumps (micrite aggregates). This suggests lime burning in non-homogeneous conditions (Gąsior *et al.* 2015, p. 215). This is a characteristic feature of medieval construction. Some of the headers visible in the face of the wall are clearly darker than the rest of the material, but no geometric schema can be observed in their arrangement. The joint of the inner (north) face is smoothed, which suggests that this part was intended for backfilling. The vee joint was used in the inner face of the wall. From the inside, in the line of the later defensive wall, toothing was found, suggesting the planned construction of the inner wall of the element almost perpendicular to the described perimeter wall, running towards the north (Fig. 8). In the lower part, on the outer side (south), a cornice made of simple, ceramic, special bricks was found. The width of the wall at its base (level 114.6 at the ground level 117.8–118.0 m a.s.l.) is about 3.2 m, at the level of the preserved coping – 2.97 m, and at the height of the pavement about 2.50 m. The height of the preserved part from the foundation level to the preserved coping

Fig. 7.
Wrocław. Arched wall: view from the south-west. In the lower-left corner of the photo the foundation is visible (photo by P. Kmiecik)

Fig. 8. Wrocław. The north end and the beginning of the middle span of the bridge seen together with the buttress. On the right side, the arched wall protected from mechanical damage (photo by P. Kmiecik)

was 2.1 m, and the total height read out from the trace of the scattered fragment was 5.2 m to the level of the pavement. The battlement height is not possible to be measured precisely due to the latterly made end bearing for ceiling beams that occur at this level, but with a certain approximation it can be assumed to be about 1.7 m, which gives the total height of the wall from the foundation level as about 7 m. On the inner (northern) side in profile there is a visible trench reaching the bottom of the masonry construction. The whole structure was founded on erratics supplemented with bricks on lime and sand mortar with visible fragments of lime (Kąsinowski 1970, p. 61). The foundation was made in a narrow trench, placed at a level of about 112.9 m a.s.l., with the coping at a level of 114.6 m a.s.l. The foundation line continues the curvature of the wall, but continues beyond the west wall of building no. 8. However, no traces of the continuation of this structure were found in the exploratory trenches established there. The coping of the preserved part of the wall coincides with the original floor level of the present building, so it can be assumed that at least the last demolition works on this part must have been related to the construction of a hospital facility. The width of the foundation at the wall's coping level is slightly wider than the base of the masonry wall and is about 3.5 m.

The analysis of the foundation level of the city-wall curtain north of the arch wall shows that, in the section of about 7 m from the second mentioned, the

area rose quite rapidly. The difference in levels in this part was over 1 m. This is confirmed by the findings of J. Badura and T. Kastek (2018, p. 139) regarding the original topography. It can be assumed that the original usable building level inside the site was between 116 and 117 m a.s.l. On the southern (outer) side of the wall, it was located between 114.5 and 115 m a.s.l., and at the level of the bottom of the moat about 113.4 m a.s.l.

South of the arch wall, below the found masonry cornice in a roller arrangement, in the line of the later city wall, a blinded two-centred arch span was found, originally interpreted as an element of a culvert or a bridge (Fig. 9). Below the second scraped element, a buttress was found, the size, shape and location of which corresponded to those found by J. Romanow on the eastern side of the same wall (Informator 1982, p. 277). It was made of solid brick with dimensions of approximately 29 x 14 x 9 cm on the mortar identical to the one found in the arched wall. In the external wall face, right next to the preserved coping, an offset profiled with ceramic special bricks was exposed. From the analysis of the preserved mortar fragments above, it can be assumed that its original slope length was at least two bricks (Fig. 10). In the lower part of the buttress, in all dimensions, there is an offset made of ceramic special bricks, similar to those found on the arched wall. Both the pillar and the buttress were set on a foundation made of granite blocks, with a plan identical to the lower part of the brick part (Fig. 11). To the south of

Fig. 9.
Wrocław. Arched wall: view from the north. Remains of concave toothing visible on the left (photo by P. Kmiecik)

Fig. 10.
Wrocław. The buttress: upper offset and arch connection are visible (photo by P. Kmiecik)

Fig. 11.
Wrocław. Lower part of the buttress. Visible foundation technology and profiled offset made of brick fittings (photo by P. Kmiecik)

the buttress, the arch of the second flying buttress begins, analogous to the first one. Due to the existing building further south, it was not fully exposed. After the demolition of building no. 9, a faceless part of a wall was found with the end of another flying buttress and the abut connection of the bridgehead with the curtain wall. There is a significant difference in the foundation level. While the bridgehead is located below the level of 112.9 m a.s.l., the adjoining curtain is founded more than 2.5 m higher, at the level of 115.6 m a.s.l., which corresponds to the foundation level of the preserved parts of the city walls' outer circuit. This means we are dealing with a three-span structure from the south, based on a partially preserved bridgehead, and from the north standing on an open arched wall. Intermediate supports are two pillars, reinforced on both sides with brick buttresses. All spans were later blinded with a brick wall less than 1 m thick. In the middle span, at 113.4 m a.s.l., a layer of bottom sediments was discovered (Fig. 12).

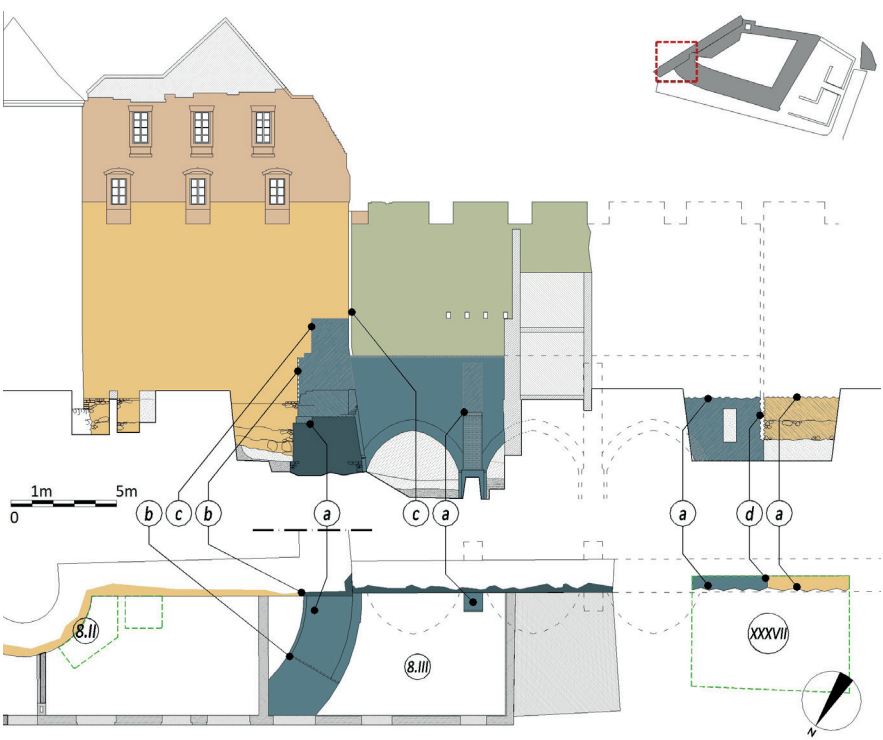

Fig. 12. Wrocław. Plan and view (view to the south-east) of the Arsenal's wall and the relict of the city-wall curtain in trench no. 8.III. Four building phases have been distinguished and are colour-coded: blue – phase I, sand – phase II, green – phase III, brown – phase IV, a – scraped wall, b – toothing, c – wall abut, d – concave toothing. An orientation scheme in the upper-right corner. The numbering of trenches marked on the plan. The same phase designations were used for all drawings in the paper. The dashed line marks the attempt of reconstruction (development by P. Kmiecik)

A small exploratory trench was also established at the southern junction of the shell tower with the curtain of the city wall. Its effect was to confirm the constant level and technology of the foundation between both elements. The foundation-footing depth is about 2 m below the current ground level, at a height of about +115.8 m a.s.l. The foundation was made in a narrow trench of eratics covered with lime mortar. At least two technology levels are visible. The only difference is a slight change in the level of the foundation coping. In the case of the tower, the stone structure is finished about 30 cm lower, at a level of about +117.1 m a.s.l. There is also no visible adjoint at this level. This may indicate that both tower and curtain belong to the same building phase.

In the opposite, north-eastern corner of the former hospital area, research was carried out, among other places, inside building no. 6. The site works were made especially difficult due to devastation of the face of internal walls on the basement floor by later users. Despite this, relics of the curtain of roundel fortifications were found, most likely parts of the curtain of the 14th-century city walls, but also (most importantly for this study) fragments of the foundations of the earliest phase, built in a narrow trench of eratics, supplemented with finger hand-made brick. The element runs almost exactly north-south, on the south side passing under the wall of building no. 6 (a fragment of the profile has been preserved here) (Fig. 13). The width of aforementioned wall at the base was over 3 m. The profile shows sloping of the outer (eastern) face at an angle of approximately 7 degrees, foundation level 112.76 m a.s.l. (Fig. 14). All these data are therefore almost identical to the previously described trench under building no. B8. In addition, there is an element directly adjacent to the found relict, most probably remains of the city walls' curtain of the second circuit (phase II), scraped on both sides. This is indicated by the difference in technology and the foundation level, similar to that in case of the arched wall and the square tower. In addition, on both sides of the wall interpreted as belonging to phase II, traces of long-lasting rainwater run-off were found in the sandy ground, forming characteristic lines in places of the face of the original wall. The date of its erection may therefore be the upper turning point in dating of the relics in question. In trench no. 6.II, a corner of a wall of the phase I was found turning at an angle close to 90° to the west. Approximately 2 m to the west of the corner, a relic of a relatively thin wall (about 80 cm) departs to the north, the continuation of which, and a fragment of the profile, were also found in the last northern section of building no. 6 (trench no. 6.I) (Fig. 15). From the north, the building was cut off by a curtain of roundel fortifications (phase V).

The continuation of the wall found in the southern span of the building (trench no. 6.III) was searched for in trench no. XLI, located at its south-west corner. Unfortunately, the concentration of active installation networks made it impossible to carry out extensive research, but a part of a wall about 1 m long was found, made in a technology corresponding to the other walls included in the 1st building phase,

Fig. 13. Wrocław. View of the south wall of trench no. 6.III. A scraped wall with a sloping face is visible on the right (photo by P. Kmiecik)

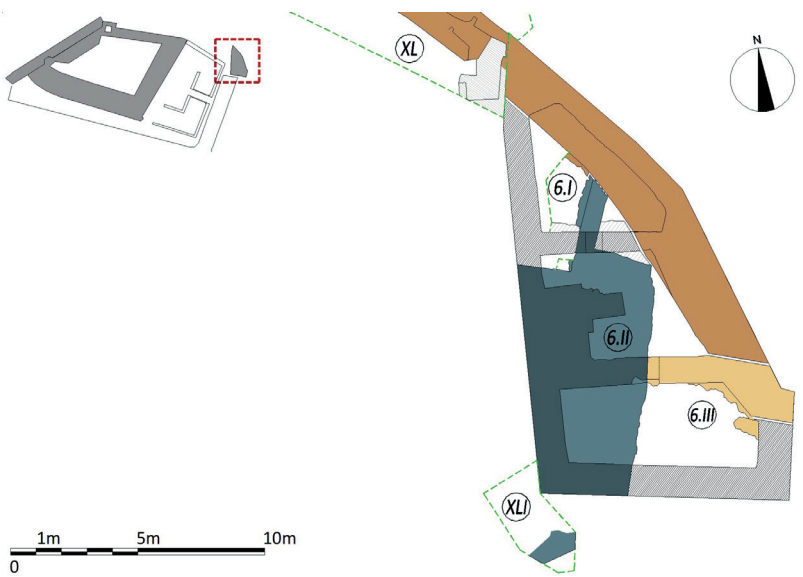

Fig. 14. Wrocław. The results of excavations in building no. 6. Four building phases have been distinguished, colour-coded: blue – phase I, sand – phase II, dark brown – phase V. Common phase designations have been used in the paper. In order to make the drawings more legible, later phases have been marked with a dashed line. The numbering of trenches and their outlines are marked on the drawing (green dotted line). An orientation scheme in the upper-right corner (development by P. Kmiecik)

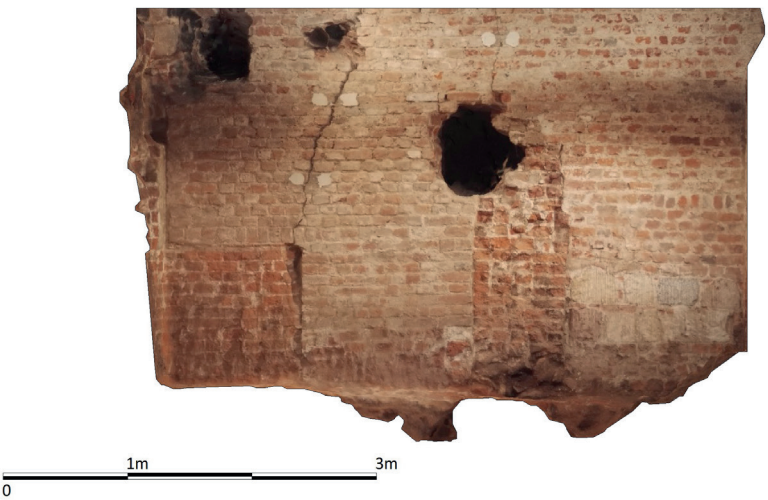

Fig. 15. Wrocław. South wall of trench no. 6.I. In the central part a cut wall of the I phase is visible. In the lower-left corner a fragment of the scraped curtain wall of the roundel fortifications (photo by P. Kmiecik)

with its face preserved. The technological parameters, the level of foundation and its location allow it to be included in the same phase with high probability. On the basis of a very short (about 1 m) part of the wall face, it is difficult to recreate the direction of its course precisely, but it can be assumed that it runs at an angle of about 45° to the west of the face found in trench no. 6.III, i.e. towards the south--eastern corner of the Arsenal.

The third important area of research was the north-west corner of the Arsenal with a square tower. In the northern part of building no. 7, excavations were carried out at the junction of the square corner tower of the Arsenal with the city-wall curtain. It was found that there is a radical change in the foundation level at the abut. The curtain of the wall is located at a level of approx. 115.0 m a.s.l., while the tower – approximately 113.7 m a.s.l. In addition, in the face of the wall, the curtain connects to the tower, but after making the outcrop described in chapter 3.2. concave toothing was discovered in its wall, prepared for connection with a perpendicular wall, not extending diagonally like the existing curtain. In turn, the outcrop made in the eastern wall of the tower at a height of about 2 m showed an abut connection with the wall of the northern wing of the Arsenal up to a depth of about 30 cm. Another element is the thickness comparison. The curtain of the city wall has a constant thickness of approximately 180 cm. Meanwhile, the thickness of the tower wall varies between 2.5 and 2.7 m (Bukowski 1974). The structure itself also seems unusual within the second perimeter of the city walls. It is a building structure on a plan

similar to a square with dimensions of 8.5 x 8.9 m. Therefore, these parameters are rather similar to the towers of the first circuit, dated before 1261 (Broniewski 1955, p. 18; Kastek 2019, p. 115). In turn, the analysis of the available cartographic materials shows that in this part of the city walls there were mainly shell towers.

Conclusions and attempt at interpretation

During the research, five building phases important from the point of view of this text were distinguished. The first phase consists of walls interpreted as an unfinished castle complex. The second and third phases are defensive city walls of the second circuit. The generally accepted fourth phase is the southern wing of the Arsenal, and the fifth – the curtain wall of roundel fortifications.

In the light of the presented current research results, as well as J. Romanow's earlier findings, the military function of the discovered element is unquestionable. Most of the general hypotheses formulated on that occasion were also confirmed. However, the issues of dating, the founder, as well as the verification of an attempt at reconstruction, remain. One of the results of the research is a completely different from J. Romanow's reconstruction shape of the south-west corner of the building. Also, in the case of the north-eastern corner, the research material was to poor and probably caused a misinterpretation of the results in the original hypothesis. The interpretation of the niches with toothing found in the south-eastern corner, as well as the idea of the existence of similar ones in the north-eastern corner put forward by J. Romanow (Fig. 1), also seem controversial. Perhaps, in the light of current research, one should see a planned donjon in this form (Mruczek 2018). This could be indicated by considerable dimensions resulting from the arrangement of niches discovered by J. Romanow. They would suggest a building element with an irregular, four-sided plan, with dimensions of approximately 13 x 13 m, and thus significantly exceeding the dimensions of the plan of the Arsenal's square tower. Another element indicating such a solution could be the considerable width of niches, exceeding 3 m. Such a thickness of the walls, similar to the thickness of the perimeter walls, seems significantly too large for internal partitions.

However, some conclusions made by R. Mruczek, M. Caban and T. Kastek cannot be verified (Mruczek, Caban, Kastek 2015, pp. 73–74. While more detailed studies have confirmed this theory in the case of the square tower, the research in the area of the foundations shows that the shell tower belongs to the same building phase as the adjoining curtains of the city wall. The formats of bricks, identical in both cases, may be explained, for example, by the use of building material from demolition from the elements of an earlier phase.

The element considered by the authors as a relic of the buttress in the south-west corner of the Arsenal turned out to be a remnant of the full-height wall of the first

building phase. Similarly, the lower part of the wall going south from this place should undoubtedly be included in this phase.

Parameters of the wall uncovered in the trench under building no. 7 correspond to parameters of the city walls of the first circuit. The exception is the tilted outer face. Such a solution can be explained by a large difference in the ground level on both sides of the perimeter wall, which meant that the structure functioned partially as a retaining wall, opposing significant ground-pressure forces. The aforementioned parameters would indicate a similar dating to the second half of the thirteenth century. A more precise result, however, can be obtained from a context analysis. The upper turning point limiting the dating in this case is the city wall of the second circuit (1299–1351), which was built on the found parts. Its curtain has been fully preserved along the western wall of the Arsenal, and the relics have also been found in the excavation inside building no. 6. It should be noted that the curtain in this part of the city was built as one of the last stages of the formation of this ring of fortifications, so it can be assumed that it was done around the year 1350.

The shape of the element was most probably dictated by its adaptation to the topography. It can be assumed that the castle was located on a fairly narrow, raised cape between the mouth of the city moat of the first district and the now defunct Odra bend, on a small elevation of the area (Badura 2010, p. 43; Badura, Kastek 2018, p. 139). In such a case, the construction of the aforementioned moat should be assumed to be the lower caesura of the dating of the building erection. A problem here may be the fact that the moat was built in two stages, first as an excavation along the curtain wall, the construction of which began most probably before 1241. However, it can be assumed with greater certainty that the moat in this form already existed in 1274, when Henryk Probus charged all owners of municipal plots with a contribution for the purpose of building city walls inside the moat (Goliński 2005, p. 50). The construction of fortifications was completed in the second half of the 13th century. However, the final shape of the city moat was obtained only during the reign of Henryk V in 1291, when it was replenished with water from Oława (Piekalski 2005, p. 43). Discovered relics can therefore be widely dated to the time between the mid-13th and mid-14th centuries.

However, it is possible to narrow down this dating at least circumstantially. Both the scale of the project and the fact that it was not completed may indicate a construction during the reign of Henryk IV Probus, i.e. between 1270 and 1290. This hypothesis is also confirmed by M. Młynarska-Kaletynowa on the basis of source texts. On the other hand, the use of Flemish bond would imply rather the end of this period (Młynarska-Kaletynowa 1986, p. 119). Earlier foundations of Probus were characterized by the use of Monk bond (with two exceptions: St. Martin chapel in the castle on Ostrów Tumski and presbytery of the church of St. Cross were made by the use of Flemish bond) (Chorowska 2017).

From the summary of all the previously cited facts, it can be assumed that the construction of the discovered castle complex began around 1280 and was probably interrupted due to the premature death of the prince in 1290.

The question of connecting the discovered building remnants with the ducal workshop seems to be obvious due to the scale of the complex. An additional confirmation may be the comparison of the workshop with other investments by Henry IV. A very strong lime-sand mortar with visible numerous lumps of lime (micrite clusters) was used as a binder in the discovered facility. However, without comparative material, such an assessment may not be fully objective. In light of M. Chorowska's recognition of a very high-quality mortar with a small amount of micrite clusters as a distinguishing feature of the ducal workshop, it seems necessary to conduct comparative analyses with samples from other ducal foundations from the period in question (Chorowska 2017, p. 932).

Taking into account the previously discussed location parameters, it can be assumed that the castle was covered from the west and north by the Odra river bed, and from the east adjacent to the first city moat. Thanks to this location, a relatively short ditch running along the southern wing of the Arsenal, along the route similar to today's Cieszyński Street, it was possible to surround the castle with water completely. The relict of this moat in the form of a layer of bottom sediments with a thickness of about 20 cm was discovered in the excavation under building B8. There are some problems with interpretation of the three-span structure discovered here. Roland Mruczek, Mariusz Caban and Tomasz Kastek expected a culvert under the city wall at this point (Mruczek, Caban, Kastek 2015, p. 73). Indeed, it is similar to the culvert under the city walls of Namysłów, which are smaller by one span. The discovered structure, however, seems far too extensive for a culvert. In addition, the construction of a culvert in this location and in this direction, significantly before the construction of the second line of city walls, seems pointless. The most logical is probably the hypothesis already put forward by J. Romanow on the basis of the buttresses discovered on the eastern side of the wall, interpreting the discovery as a fragment of a bridge. Jerzy Romanow, having not discovered a similar structure east of the discussed one, decided that he was dealing with its eastern side. Now, knowing the layout of the structure also on the west side, we know that it was impossible. Due to the shape of the castle wall, any passage could only be located east of the exposed structure. In this situation, two hypotheses seem logical, according to which we are dealing either with a brick cover of an entirely wooden structure of the bridge, or with a mixed structure, brick and wooden. In both cases, a durable, brick structure shields the potential crossing from the west side most vulnerable to attack, leaving the structure exposed on the city side. Such a hypothesis seems to be confirmed also by the very high wall of the bridge – from the top of the arcade to the cornice it is about 3.5 m. Therefore, it can be assumed with high probability that the cornice of the wall was raised about 3 m above its usable level.

In this case, it is worth noting that the crossing did not lead directly to the city, but parallel to its fortifications towards St. Nicholas' Gate. This solution made the castle independent from the city. It can be hypothesized that the road between the castle and the one leading from the gate to the west were later included in the city fortifications of the second circuit as a part of an underwall street (similarly to the curtain of the bridge, it was included in the line of the city walls).

Also noteworthy is the concave toothing found in the arched wall directly opposite the bridge wall, in a place where you would expect some sort of a gate building (perhaps another tower).

Of interest, but also difficult to interpret, is the discovery made under building no. 6, combined with the fact that no separate relics of the water gate tower have been found, clearly visible both on plans and in F. B. Wehrner's drawing (Wehrner 1755). The most serious hypothesis is that this tower could have been (like the square tower of the Arsenal) part of an earlier foundation – and it was its relics that were exposed. This interpretation is supported by the geometry of the exposed walls, as well as the size of the element, which seems to be very similar to the square tower of the Arsenal. The latter has dimensions of about 8.5 x 8.9 m (Bukowski 1974) and, assuming that we are dealing here with a tower, the discovered relics may indicate a side approximately 8.8 m long. Interesting results are obtained when trying to overlay the outline of the Arsenal's square tower over the discovered relics (Fig. 16). It turns out that it precisely fills the space between the preserved wall of Freiderick's warehouse and building no. 6 in a manner consistent with the above-mentioned drawing by F. B. Wehrner (Fig. 5). The exposed fragment of the profile, in which the inclined face of the wall is clearly visible, speaks against this hypothesis. In the discussed assumption, this is an element characteristic for curtains, but incomprehensible in the case of a tower. However, the question remains whether the present southern foundation wall of building no. 6 does not exactly cover a landmark, which could be the corner of the tower. This could explain the apparently contradictory premises. Such a situation seems to be suggested by a comparison with the outline of the Arsenal tower.

Unfortunately, in case of the castle in question, we only have an incomplete outline of the outer walls with only few elements suggesting possible development of the inside (Fig. 17). It is difficult to attempt any reconstruction on this basis. The excavation work cannot be considered completed either. The details of the northern wall of the Arsenal, as well as the area to the east of it, currently limited by Cieszyńskiego Street, Nowy Świat and the southern bank of the Odra River, require more explanation.

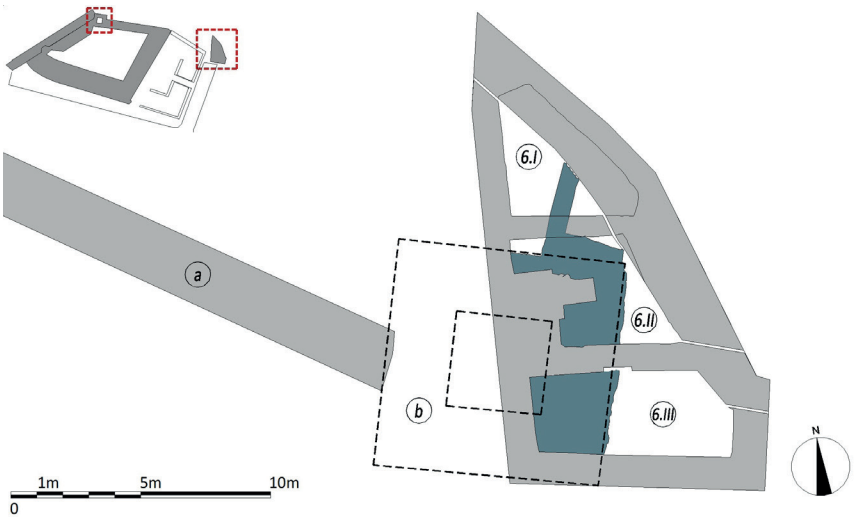

Fig. 16. Wrocław. Comparison of the outline of the square tower of the Arsenal (b) with the relics found under building no. 6: a – preserved wall, 6.I–6.III – trenches under building no. B6; blue colour indicates uncovered relicts (development by P. Kmiecik)

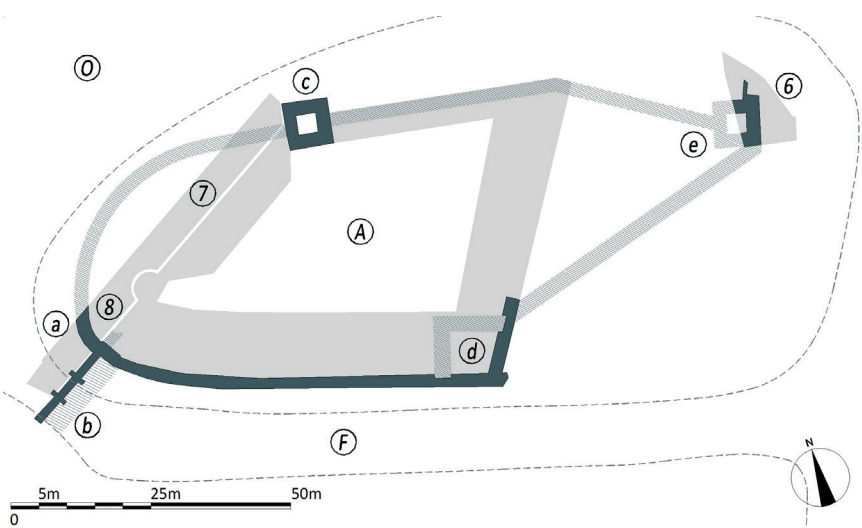

Fig. 17. Wrocław. An attempt at reconstruction of the castle on the basis of previous excavations. Research results (blue) and hypotheses (dashed): 6–8 – hospital buildings, A – St. Nicholas' Arsenal, F – castle moat, O – Oder river, course – after Badura, Kastek's 2018. a – arched wall, b – bridge, c – square tower of the Arsenal, d – niches with toothing – after Romanow 1981; 1992; e – water gate tower (development by P. Kmiecik)

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