

# MEDIEVAL HALL CHURCHES IN SILESIA

## PART 4. CHURCHES BETWEEN THE 13<sup>TH</sup> AND MID 16<sup>TH</sup> C.

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### Introduction

In the Middle Ages hall churches in Silesia (in its historical borders) were quite numerous and accounted for nearly half of three-aisle churches – 54 churches taking into consideration all stages. They were erected in the area from Gubin to Żory and Bytom (Fig. 1). In the 13<sup>th</sup> c. the highest density of churches was observed in Wrocław and its surrounding area and near Grodków, Henryków and Kamieniec Ząbkowicki. In the 14<sup>th</sup> c. three hall churches were built in Wrocław, four in the region of Nysa and Ząbkowice Śląskie, other churches were scattered in the whole discussed area. In the 15<sup>th</sup> and 16<sup>th</sup> c. they were more evenly distributed in the whole area of Lower Silesia, with larger number of churches in the north-west part: Gubin-Szprotawa and Lwówek Śląski-Mirsk. In this last period the largest number, i.e. 21 churches were built or reconstructed.

The three previous articles<sup>1</sup> presented buildings erected in subsequent centuries. The purpose of this article is showing changes which took place in churches from the 13<sup>th</sup> c. to the mid 16<sup>th</sup> c.

### 1. Projection and body

The first hall churches in Silesia were built in the first tierce of the 13<sup>th</sup> c. in Wrocław, Oleśnica and Dzierżoniów. These were parish churches with a simple spatial design which consisted of a rectangular body without towers, not very elongated and most certainly rectangular chancel<sup>2</sup>. Walls were supported on buttresses, although vaults were probably built only in chancels (Fig. 2).

The hall spatial design was adopted by Franciscan churches in Wrocław and Cistercian churches in Henryków in 1230. Bodies of monastic churches were more developed. The Franciscan church had a long, rectangular chancel, in which a rectangular apse was separated, there was a long nave, the whole interior was vaulted. In the Cistercian church a rectangular three-bay chancel was designed for the first time, there was an ambulatory and radial chapels which were planned to be vaulted<sup>3</sup>.

In the third quarter of the 13<sup>th</sup> c. parish churches were still built with rectangular chancels (Grodków, Kozuchów), however, at the same time chancels with polygonal endings started to be built (Głubczyce, Racibórz). Whole interiors in most churches were vaulted. The church in Złotoryja was exceptional as there was a transept, however, it came from the first construction stage when the church was planned to be a basilica church. A new element in this period were elevations with two towers (Głubczyce, Racibórz, Złotoryja), (Fig. 2). Towers reached nave wall copings and their interiors were open to church interiors thanks to tall arcades. Next to chancels there were sacristies built at the same time as chancels, and in the church in Grodków there was the first open porch leading to the nave.

In the fourth quarter of the 13<sup>th</sup> c. the construction of the Cistercian church in Kamieniec Ząbkowicki (1272) and the Collegiate Church of the Holy Cross in Wrocław started (1288–1295 the chancel, transept and at least external walls of the lower church were built). The buildings had well developed spatial designs and were considerably tall. They determined the beginning of the developed Gothic which was popular in Silesia in the 14<sup>th</sup> c. (Fig. 3).

<sup>1</sup> H. Kozaczewska-Golasz, *Średniowieczne kościoły halowe na Śląsku. Część 1. Kościoły z XIII w.*, "Kwartalnik Architektury i Urbanistyki" ("KAiU"), Warszawa 2013, vol. LVIII, brochure 1; idem, *Średniowieczne kościoły halowe na Śląsku. Część 2. Kościoły z XIV w.*, "KAiU", vol. LVIII, brochure 2; H. Kozaczewska-Golasz, H. Golasz-Szołomicka, *Średniowieczne kościoły halowe na Śląsku. Część 3. Kościoły z XV – połowy XVI w.*, "KAiU", vol. LVIII, vol. 3.

<sup>2</sup> There was a rectangular two-bay chancel was in St. Lawrence (St. Elizabeth) Church in Wrocław, in the other parish churches the design of church endings is not known.

<sup>3</sup> Shafts with heads were preserved, after the Tatar invasion in 1241 the church design was changed into a basilica.

A rectangular hall choir in Kamieniec Ząbkowicki corresponded with the eastern part of the Cistercian church in Henryków. External walls were held by high buttresses between which there were tall windows. The Collegiate Church of the Holy Cross with a single-aisle chancel ended with a polygon and transept arms impresses with its high body. Towers were not built on the western side, they were built in the corners between the nave and the transept. Two-level interiors are not very high and their proportions were set during the construction of the eastern part.

Parish churches were changed too. As early as the end of the 13<sup>th</sup> c., a single tower was built in the northern corner of the chancel and the nave in the churches in Kozuchów and Żary. Such asymmetric location of towers was replicated in the 14<sup>th</sup> c. in parish churches in Paczków and Wołów, in the Franciscan church in Środa Śląska and in St. Dorothy Church in Wrocław (Fig. 4). Parish churches in Namysłów and most probably in Gliwice, as well as the collegiate church in Głogów had one western tower, only the Church of Virgin Mary on the Sand in Wrocław there was an elevation with two towers. Other 14<sup>th</sup> c. churches had no towers. Sacristies were usually built during the second stage of construction when a church was finished.

Transepts in the Cistercian church in Kamieniec Ząbkowicki and in the Collegiate Church of the Holy Cross in Wrocław follow the 13<sup>th</sup> c. concept and they are the last transepts built in hall churches. In the collegiate church in Głogów (1335–1401) a two-storey sacristy and a chapel were erected along the sides of a long chancel to create a pseudotransept, however these extensions must have been covered with separate roofs parallel to the chancel roof (Fig. 5).

Chapels opening to the church interior were built between buttresses along aisles in the collegiate church in Głogów at the very beginning of the church construction. A similar solution was used in the nave of the church in Nysa (before 1292).

In the 13<sup>th</sup> c. three-aisle chancels occurred only in the Cistercian churches (Henryków, Kamieniec Ząbkowicki). In the 14<sup>th</sup> c. in the Church of Virgin Mary on the Sand in Wrocław (1334–1390) the first chancel with three aisles in a hall design was built, it ended with three polygons. The nave and the chancel of the church were connected and formed one long hall, most probably they were covered with three roofs. Hall chancels with three aisles ending with polygons were built also later in the 15<sup>th</sup> c., e.g. in churches in Namysłów, Opole and Lwówek Śląski (Fig. 6).

In the 15<sup>th</sup> and 16<sup>th</sup> c. churches with single-aisle chancels ended with polygons were still built. A 13<sup>th</sup>-century design with a rectangular chancel was replicated in St. Barbara Church in Wrocław, however, the construction design was changed. Chancel walls were not very thick and on the outer side they were left smooth without any fragmentations while buttresses were moved to the interior.

In the 15<sup>th</sup> c. a new spatial design of a church with a hall chancel with an ambulatory was used (Fig. 7). The parish church in Szprotawa was built the earliest (1416–1424), it had a uniform hall interior, later the chancel of the church in Nysa was built (1424–1430), here additionally chapels were built along aisles. The earlier nave (before 1392) and the chancel form a long, uniform interior. In the architectural space there was no division into a priestly and lay area. Apart from this, it is the tallest hall church in Silesia, its nave is 27.20 m high.

A chancel with an ambulatory in the church in Góra is surrounded with radial chapels, in Gubin the whole church is surrounded with chapels. Interiors of these churches are not uniform, as it was the case of the previously described churches, because a three-arcade wall divided space half way along church length. In this way the division into a sacral area and an area for believers returned.

## 2. Construction and interiors

Hall construction rules between the 13<sup>th</sup> and the mid 16<sup>th</sup> c. did not change significantly, except for a few buildings. The main design was longitudinal created by walls and pillars carrying arcades and partition walls between aisles. It was combined with a transverse design. Initially it was created by buttresses and inside half-pillars or pilasters with colonettes as well as perpendicular arches (Wrocław, St. Jacob Church), later shafts and transverse arches in the form of ribs (Złotoryja, Głubczyce), and from the beginning of the fourth quarter of the 13<sup>th</sup> c. – without shafts but with reinforced buttresses (Kamieniec Ząbkowicki, Wrocław – the Collegiate Church of the Holy Cross).

The number of windows increased, they became wider and only small areas were left for walls between buttresses – the construction system became closer to a frame construction composed of pillars and buttresses supporting ribbed vaults. A reack frame construction was used in Gubin. It is made of buttresses and pillars. Walls with windows are rela-

tively thin, they are located half-length of buttresses and supported on vaults of chapel which cover the whole bottom part of buttresses.

Shafts as construction wall fragmentation elements were used from the first quarter of the 13<sup>th</sup> c. (Wrocław, Złotoryja) to the end of the 13<sup>th</sup> c. (Złotoryja, the nave from the second half of the 13<sup>th</sup> c., St. Hedwig Chapel in Trzebnica 1268/69 and the parish church in Jawor (end of the 13<sup>th</sup> c. – 1<sup>st</sup> half of the 14<sup>th</sup> c.), (Fig. 8). At the same time in the third quarter of the 13<sup>th</sup> c. suspended shafts were introduced (Grodzów, Racibórz), and from the fourth quarter of the 13<sup>th</sup> c. shafts were completely given up (Kamieniec Ząbkowicki, Wrocław – the Collegiate Church of the Holy Cross), ribs were set in walls sank into walls and based on brackets or undercut. Brackets supporting ribs were used as early as the first quarter of the 13<sup>th</sup> c. (the chancel in Złotoryja), they were still used in the second quarter of this century (Wrocław, Henryków), and later in the fourth quarter of the 13<sup>th</sup> c. Without shafts interior walls were plain without fragmentation, only with windows which stretched from vaults down to the floor (Fig. 9). Shaft returned in the Late Gothic (Gubin, the chancel).

In the 13<sup>th</sup> c. interior were covered with six-partite rib vaults and cross-ribbed vaults on a square or rectangular plan. In the first half of the 14<sup>th</sup> c. in the nave of the Collegiate Church of the Holy Cross in Wrocław, start vaults were used for the first time, they were used in the nave and five-support vaults were used in aisles (Fig. 10, 11). Such design of vaults was replicated in Wrocław in the Church of Virgin Mary on the Sand, St. Dorothy Church and the parish church in Paczków. The number of buttresses was two-fold higher than the number of pillars. However, in Namysłów pillars were moved from the axis of buttresses and an asymmetrical vault design was created, its bays were made on a trapezoid plan. Such a concept was not accidental, it was well thought over as it introduced motion and dynamics to a church interior (Fig. 11).

In the 15<sup>th</sup> – 16<sup>th</sup> c. vault bays were most often rectangular and pillars between aisles were thickly spaced. Naves separated with arcades were covered with new types of vaulting: rich star vaults, net vaults with various rib networks and cell vaults (Fig. 12).

Church interiors were divided into three aisles, the nave in the middle in most churches was nearly twice as wide as aisles<sup>4</sup>. As a result of such width ratio the whole interiors were well-lighted. Wider aisles were used in churches located in the southern and northern regions of the district. In the 13<sup>th</sup> c. churches were not very tall, about 15 m, and width to height ratios of naves were 1 : 1.6 - 1.8. There were higher ratios in the church in Głubczyce and especially in Racibórz (1 : 2.86), in which all three aisles had similar width. Walls and pillars were fragmented with pilaster strips or shafts, which made interiors look higher (Fig. 13).

The church in Kamieniec Ząbkowicki, which was 23.60 m high and the nave to aisles ratio was 1 : 2.73 set new standards for 14<sup>th</sup> c. churches. The average height of church was not considerable, about 16 m, and about 1 : 2 ratio, like in St. Hedwig Chapel in Trzebnica and the upper church of the Collegiate Church of the Holy Cross in Wrocław. A few churches had a significant height. The Church of Virgin Mary on the Sand in Wrocław was 23.10 m high with 1 : 2.60 ratio, St. Dorothy Church was 25 m high with 1 : 2.72 ratio, and the church in Nysa was the tallest – 27.20 m and 1 : 2.96 ratio. (Fig. 14).

Most church interiors had walls without fragmentation, only with high and wide windows, which made the aisles look bigger than they actually were. However, in the second half of the 14<sup>th</sup> c. new forms of wall fragmentation and ways of making walls thinner were needed. They were achieved by elongation of window niches to the floor (Paczków, Wrocław – St. Dorothy Church), which reduced wall thickness under windows by half. At the same time, niches added rhythmical divisions to walls and gave them great plasticity. Octagonal pillars and octagonal pillars with pilaster strips emphasised vertical design and the fact that they were widely spaced made interiors look very spacious (Fig. 15).

In the church in Nysa (the nave built before 1392) the thickness of side walls, in which there were arcades leading to porches and chapels filling spaces between buttresses, was reduced. Over chapel vaults, in the window zone, walls were thickened from the outside. The internal aisle wall remained plain (Fig. 14).

In the 15<sup>th</sup> c. in interiors there were still ratios in which the nave was two-fold wider than aisles,

<sup>4</sup> In literature such aisle design is sometimes wrongly called a basilica projection. In Silesia it is also a hall projection.

except for churches in Bytom and Gubin. Most churches had width to height ratios of the nave of 1 : 1.6 - 2.00. The highest chancel was in Nysa, it was 27.20 m (Fig. 16). Similar cross-section ratios to Nysa were in the church in Gubin, 1 : 2.90, only church height was lower, about 20.50 m, however, aisle ratios were different. Slender proportions characterised also churches in Góra and Szprotawa.

An important achievement in the Late Gothic was the introduction of a hall chancel with an ambulatory and chapels. Ambulatory walls had various adaptive fragmentations: window niches reaching the floor (Nysa – an ambulatory), two levels – arcades to chapels and windows (Nysa – aisles, Gubin), and even three levels – arcades, high blind windows and windows (Góra), (Fig. 17, 18). In Gubin, additionally there were buttresses with a passage at the window level. In the chancel of this church shafts returned to the axes of internal buttresses, they crowned heads with masks.

The latest church, erected in the mid 16<sup>th</sup> c., was the parish church in Mirsk. A hall space with three aisles ended with an eastern polygon. In this church vaults make one net over the whole interior without a traditional division into aisles. The nave ratio is 1 : 2, ogival arches together with full arches and a uniform vault created a pure, harmonious interior (Fig. 19).

### 3. Architectural and sculptural details

Architectural details encompass: pillar components, elements related to vaults, windows, portals, decorative elements on buttresses and elevations.

In the first half of the 13<sup>th</sup> c. there were quadrangular pillars and cross pillars with shafts (Wrocław – St. Jacob Church, Henryków). They were supported on bases with clips and were crowned with socket heads. In the second half of the same century, rectangular pillars and cross pillars with shafts and clusters of shafts were used (Złotoryja, Głubczyce). Bases with flattened plates were small supported on rather high pedestals. There are socket or basket heads covered with decorative plant ornaments and crowned with a profiled cornice (Fig. 8).

In the second half of the 13<sup>th</sup> c. rectangular pillars and cross pillars with shafts located between aisles made way for octagonal pillars (Głubczyce). The last quarter of the 13<sup>th</sup> c. brought significant chang-

es – it is the time when octagonal and cross pillars without shafts on rather high pedestals (Kamieniec Ząbkowicki) or low pedestals (Wrocław – St. Bartholomew Church) appeared. Profiling pillars without heads smoothly turned into arcades and perpendicular arches (Fig. 9).

A characteristic feature of Silesian churches in the 14<sup>th</sup> c. were octagonally elongated pillars with pilaster strips, they have skew surfaces which are plain or profiled (Fig. 20). Apart from this type of pillars there were also equilateral octagonal pillars with or without pilaster strips as well as cross pillars near the tower. They did not have heads, sometimes only they had a modest cornice. Profiling pillars and pilaster strips turned into arcades. In the 15<sup>th</sup> – 16<sup>th</sup> c. the same, earlier types of pillars were still used.

From the beginning of the 13<sup>th</sup> c. in vaults there were ribs with various cross-sections changing with time. At the beginning they had a roll-shaped cross-section and in the third quarter a pear-shaped cross-section with nibs was introduced (Głubczyce, Grodków, Trzebnica), there were also trapezoid-shaped cross-sections with single cavettos (Grodków). As early as the fourth quarter of the 13<sup>th</sup> c. a profile with double cavettos and a rectangular end appeared (in arcades in the church in Złotoryja and in ribs in the chancel and transept of St. Bartholomew Church Wrocław). A profile with double cavettos was used at the end of the Middle Ages. At the end of the 14<sup>th</sup> century pear-shaped profiles with nibs regained their popularity (Wrocław – the Church of Virgin Mary on the Sand), which was also used later in the next centuries.

Vault ribs were connected with keystones with leaf ornaments or escutcheons (from the 14<sup>th</sup> c.) and keystone rings. In the 15<sup>th</sup> – 16<sup>th</sup> c. on vaults with a thick rib network, there were often bossed keystones or escutcheons, however, they were relatively small. In a few churches there are keystones decorated with sculptures. In Złotoryja sculptures are flat while in the sacristy of the church in Nysa they are solid, hanging sculptures.

Sculpture decorations occurred also on brackets in churches from the 14<sup>th</sup> c. The richest set of brackets with full figure sculptures can be found in the Church of Virgin Mary on the Sand in Wrocław. R. Kaczmarek noticed in them Italian influences of A. Pisano and his son<sup>5</sup>.

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<sup>5</sup> R. Kaczmarek, *Rzeźba architektoniczna XIV w. we Wrocławiu*, Wrocław 1999.

Large windows required constructions supporting glass. Hence there are bar tracery or tracery windows which were also very decorative. They were used from the first quarter of the 13<sup>th</sup> c., initially in small windows (Złotoryja) and later in larger ones. Until the third quarter of 13<sup>th</sup> c., in tracery bipartite and tripartite windows there were ogival arches, circles and multifoils, which created central and multi-level compositions. In the fourth quarter of the 13<sup>th</sup> c. windows became bigger and there were more composition elements (Wrocław – the Collegiate Church of the Holy Cross, churches in Kamieniec Ząbkowicki and Złotoryja)<sup>6</sup>, (Fig. 21).

In the 14<sup>th</sup> c., just like before, window wings opening on both sides were assembled in thick walls. They were larger in size and had various numbers of sections, from two to six (Fig. 22). The widest windows were in the elevations of the Collegiate Church of the Holy Cross in Wrocław and in the parish church in Nysa. In terms of composition, tracery windows can be divided into central, developed central and multi-level traceries.<sup>7</sup> In the 14<sup>th</sup> c. such forms as vesicae piscis, escutcheons, “rotating” and concentric compositions started to be used.

In six churches from the 15<sup>th</sup> and 16<sup>th</sup> c. there are tracery windows, and tripartite or quadripartite with rich compositions are in Nysa, Lwówek Śląski and Namysłów. In terms of composition they can be divided, just like in earlier periods, into central and multi-level ones<sup>8</sup>. There are no rotating motifs in them. New forms are semi-circular arches connecting every other bar and fragments of profiles going through an intersection line and cut off. Apart from well known compositions made of ogival arches, circles and multifoils, there were also new compositions and curved-line figures (Lwówek Śląski) as well as linear traceries with bars which when elongated make a network of slightly bent intersecting lines in under arch areas (Fig. 23).

An important element in churches were portals. In 13<sup>th</sup> c. churches 12 portals of various sizes and compositions have been preserved: external reveal, recessed, recessed with colonettes and fragmented

ones (Fig. 24). There were two projection portals crowned with a wimperg (Złotoryja, Głubczyce). Jambs were supported on bases and pedestals, they were crowned with socket or socket-block heads with plant ornaments sometimes with masks. Only in the portal of St. Hedwig Chapel in Trzebnica there is a tympanum, or even two tympanums, because the second one is located at the chancel side<sup>9</sup>.

Portals from the 14<sup>th</sup> c. have been preserved in 11 churches, they differ in function, size and composition. In terms of composition they can be divided into: external reveal, recessed and fragmented ones, they were set in rectangular jambs with collonettes, pinnacles or wimpergs (Fig. 25). Jambs are composed of small rolls, rolls with nibs and cavettos located in the recessed or fragmented designs in a straight or broken line. Jambs rest on high, profiled pedestals, most often they have no heads and turn to an archivolt through profiling. Collonettes or pinnacles as well as frames and wimpergs located on the sides enrich the composition. Numerous portals except for architectural decorations, also have sculptural decorations in the form of masks in the keystone, figure sculptures under canopies (they have not been preserved), sculptures with an archivolt, sculptures on brackets (Fig. 26). In two portals original figure tympanums have been preserved<sup>10</sup>.

In the 15<sup>th</sup> and 16<sup>th</sup> c. portals did not play such a significant role as in the previous centuries. They have been preserved in only six churches, they are not very large in size with profiles, not very well developed jambs. In portals, just like in windows and vaults, intersecting profile motifs were used. A new composition was a double-arm portal preserved in the porch of the church in Kały Wrocławskie (Fig. 27).

### Final remarks

The hall church came to Silesia from the West, together with a new spatial and administrative organisation of town laws. First it was adopted by parish churches, later also by monastic ones. Churches from the first half of the 13<sup>th</sup> c. were modest, they

<sup>6</sup> H. Golasz-Szołomicka, *Longitudinal tracery windows in Silesian churches from the second half the 13<sup>th</sup> century*, “Architectus” No. 1(27), Wrocław 2010, pp. 15-22.

<sup>7</sup> H. Golasz-Szołomicka, *Tracery windows from the 14<sup>th</sup> century in Silesia*, “Architectus”, No. 1(31), Wrocław 2012, pp. 21-34.

<sup>8</sup> H. Golasz-Szołomicka, *Okna maswerkowe z XV-XVI w. na Śląsku*, “Architectus”, in print.

<sup>9</sup> T. Kozaczewski, H. Kozaczewska-Golasz, *Portale trzynastowiecznej architektury na Śląsku*, Wrocław 2009.

<sup>10</sup> H. Kozaczewska-Golasz, A. Bernaś, *Portale czternastowieczne w kościołach śląskich*, “KAiU”, vol. LV, brochure 1-2, Warszawa 2010, pp. 53-74; H. Kozaczewska-Golasz, A. Bernaś, *Portale czternastowieczne w kościołach śląskich, detale architektoniczne i rzeźbiarskie*, “KAiU”, vol. LV, brochure 1-2, Warszawa 2010, pp. 75-92.

were composed of a rectangular nave and most probably rectangular chancel, except for the extended chancel in the Cistercian church in Henryków. Only fragments of these churches have been preserved. Searching for similar solutions in the West was not successful. It can be assumed that they were also reconstructed in later periods. Few preserved early hall churches in France<sup>11</sup>, Bavaria<sup>12</sup> and Westphalia<sup>13</sup> decisively differ in their spatial design.

Hall churches from the second half of the 13<sup>th</sup> c. have been preserved in France, Germany (Mecklenburg, Hesse and Westphalia)<sup>14</sup>, Austria<sup>15</sup> and Czech<sup>16</sup>. They differ in interior design, although similar architectural and sculptural details were used. In Silesia pillars with shafts were hardly ever used and there are no cylindrical pillars. Walls in most Silesian churches were plain, without shafts, there were only large windows.

The genesis of spatial design as well as architectural and sculptural decorative forms in 14<sup>th</sup> c. churches was searched for in Germany, Austria and especially in Czech. Meanwhile they can be found in England (vaults, portals with pinnacles, traceries)<sup>17</sup> and Italy (pilaster strips, sculptures, portals with pinnacles)<sup>18</sup>. Although Silesia became Czech fiefdom, there are no clear influences of Czech or Austria, where numerous hall churches were built. Medieval architects in Silesia created their own type of Gothic using influences from various countries. They created developed Gothic architecture, different from classical Gothic, it was spacious, asymmetrical and dynamic.

Churches with a hall ambulatory were first built at the beginning of the 15<sup>th</sup> c. and they followed German<sup>19</sup> and Austrian design<sup>20</sup>. However, the interior

solution which was used, namely octagonal pillars was traditionally Silesian. In the north, in Gubin, the design of Western Pomeranian churches was followed<sup>21</sup>, similarities encompassed interior articulation with internal buttresses, chapels in basements, windows above them and passages at the window level.

Vaults played an especially important role in churches from the 15<sup>th</sup> and 16<sup>th</sup> c., their design came from the West, and in the case of net vaults from Czech, they followed the Parler vaults<sup>22</sup>. Asymmetrical five-support vaults were given up. A rich network of cross and net ribs, depending on their design, introduced rhythmical or dynamic divisions to interiors. Vaults required thickly spaced pillars, which to a small extent disturbed the impression of spaciousness.

Great mobility of Medieval constructors makes it impossible to precisely indicate sources of forms, constructions of vaults or architectural and sculptural details today. Similar forms can be found in numerous European churches.

Translated by A. Tyszkiewicz

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<sup>19</sup> *Gotyck*, op. cit.

<sup>20</sup> W. Buchowiecki, op. cit.; R. Wagner-Rieger, op. cit.

<sup>21</sup> S. Skibiński, *Pomorze Zachodnie i Nowa Marchia*, [in:] *Architektura gotycka w Polsce*, ed. T. Mroczo and M. Arszczyński, Warszawa 1995.

<sup>22</sup> D. Hanulanka, op. cit.; M. Zlat, *Najstarsze sklepienia sieciowe w Polsce*, "KAiU", vol. XVII, brochure 1, Warszawa 1972, pp. 3-119.

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