

II. THE THOMASKIRCHE

One of the aims of this study is to find out how many musicians Bach deployed during the performance of his cantatas, passions and oratorios in the two main churches in Leipzig, and also how he deployed these musicians. For this purpose it is necessary to know what the interior of these churches looked like, especially the locations from where music was performed. Was the situation in both churches comparable? In order to understand the context in which this music was performed, it is important to have knowledge of the acoustic conditions and the position of the listeners. These topics will be discussed in this first chapter.

1. What did the exterior and interior of the *Thomaskirche* look like at the time of Bach?



Fig. 1a/b. The *Thomaskirche*; south side with tower and chapels.

On the left: Engraving by Johann Gottfried Krügener sr., frontispiece *Schulordnung*, Leipzig 1723.

Right: Lithograph by Ludwig Hofmann, 1858.

Archiv der evangelisch.-lutherische Thomas-Matthäi-Gemeinde Leipzig.

Around 1710 the Leipzig historian and theologian Johann Jacob Vogel described the *Thomaskirche* in detail.¹ In addition, there are descriptions by two sextons and two plans of the seating arrangements, which will be discussed below. On the basis of these and other sources, Ernst-Heinz Lemper in 1954 and the then superintendent Herberth Stiehl of the

¹ Johann Jacob Vogel, *Leipzigerisches Chronicon*, Leipzig, c. 1710, p. 107ff.

Thomaskirche in 1984 published studies of the church describing the exterior and interior in Bach's time.²

The *Thomaskirche* was built in the period 1482-1496 as a late Gothic monastery church to replace an older church. In 1539, Duke Heinrich der Fromme introduced the Reformation throughout Saxony with a ceremony in Leipzig. On this occasion, Martin Luther preached in the *Thomaskirche*.³ On the inner side the three-aisled nave is 39.5 m long and 24.7 m wide. The height of the nave is 17.6 m to the top of the vault. The steep roof (63°, ridge 45 m high) was slated again in 1684. On the north and south side, a total of 12 private chapels were built against the church, some of them being used as burial chapels (figs. 1a/b and 2). The tower was erected in the 14th century on the north side of the crossing (the space between the rather small altar choir and the nave), and has a height of 68 m. The lantern dates from 1702. In 1628 the church was extended on the western side with a new *Vorbau*, consisting of chapels and storerooms. An even larger *Vorbau* (33 x 4 m) from 1705 on the northern side included, in addition to chapels, a barred *Narrenhäuschen* for the confinement of blasphemers and cursers; this intervention made the northern side of the interior of the church dark, especially under the galleries (Figs. 2 and 3a).



Fig. 2. The *Thomaskirche* seen from the northwest, with the northern *Vorbau* of 1705 on the left, On the right a part of the western *Vorbau* from 1628 and the *Thomasschule* (photo before 1884).
Archiv der evangelisch-lutherische Thomas-Matthäi-Gemeinde Leipzig.

In the course of time the interior of the church was adapted to the taste of the various periods (Gothic, Renaissance, Baroque, Classicism and Historicism). Since way back the three vaults have been supported by seven pillars; the plastered vaults had coats of arms. The floor was covered with burnt tiles. In 1570 Renaissance galleries (*Emporkirchen*) of slightly porous red sandstone were built on the north, west and south sides,⁴ resting on stone pillars (Fig. 3b; shown crossed in Fig. 7). On the west side the depth of the galleries was 9.7 m; on the other walls 4.8 m. The underside of these galleries was shaped as a vault (see end note A).

² Ernst-Heinz Lemper, *Die Thomaskirche zu Leipzig*, Leipzig 1954; Herbert Stiehl, 'Das Innere der *Thomaskirche* zur Amtszeit Johann Sebastian Bachs', *Beiträge zur Bachforschung*, Heft 3, Leipzig 1984; where not otherwise stated, information is borrowed from both studies.

³ Johannes Herrmann, "Im neuen Glauben (1517-1699)", *St. Thomas zu Leipzig*, hrsg. v. Herbert Stiehl, Berlin 1962, p. 29-65, at p. 25.

⁴ Hope Bagenal, 'Bach's Music and Church Acoustics', *Music & Letters* 11/2, 1930, p. 146-155, p. 154.

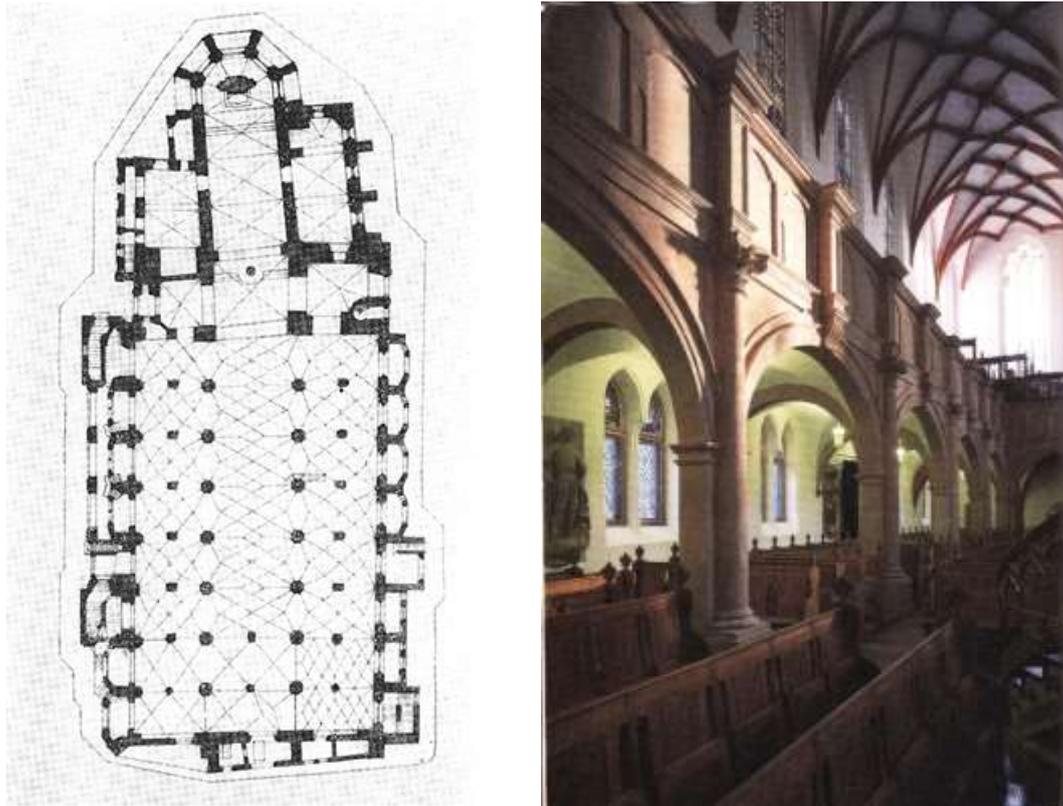


Fig. 3a/b. Left: Floor plan, with outer chapels and *Vorbauen*, before 1872. Stiehl 1984, p. 63.
 Right: Stone Renaissance gallery, 1570; south side, towards the west (photo 2000).
 Martin Petzoldt, *St. Thomas zu Leipzig*, Leipzig 2000, p. 30.

In 1614, a total of 30 plates with proverbs were attached to the walls of the galleries. The frames and the letters were gilded; the plates themselves were black (Fig. 4).



Fig. 4. Plate (1614) with proverb "The Lord is my portion, says my soul; therefore I will wait for him."
 (Lamentations 3:24). *Thomaskirche* Leipzig, photo Rens Bijma 2018.

The large organ was placed against the western back wall in 1601 and the small organ opposite, over the entrance to the altar choir (Chapter XVIII). In the 1630s wooden galleries were built above the stone galleries, e.g. along the north wall, and to the left and right of both organs respectively on the west and east wall. In 1684 the large seat for the elector (*Fürstentstuhl*) was built in the middle of the northern gallery. Other striking, richly decorated elements were the altar with painted shutters, the sacristy and the library to the left and right of the altar choir, the pulpit, the baptismal font, the *Rathsstuhl* (councils' seat) with twelve seats and the small organ at the *Schwalbennest* (Swallows' nest, Fig. 5, 12). In addition, the church was decorated with numerous statues, portraits, private chapels, plates with proverbs, mourning boards and other epitaphs. Many galleries were painted white and gold. Lemper assumed that the *Rathsstuhl* was located in the *Schülerchor*; Stiehl concluded from the seating plans (fig. 6) that this was not the case until after 1773.⁵

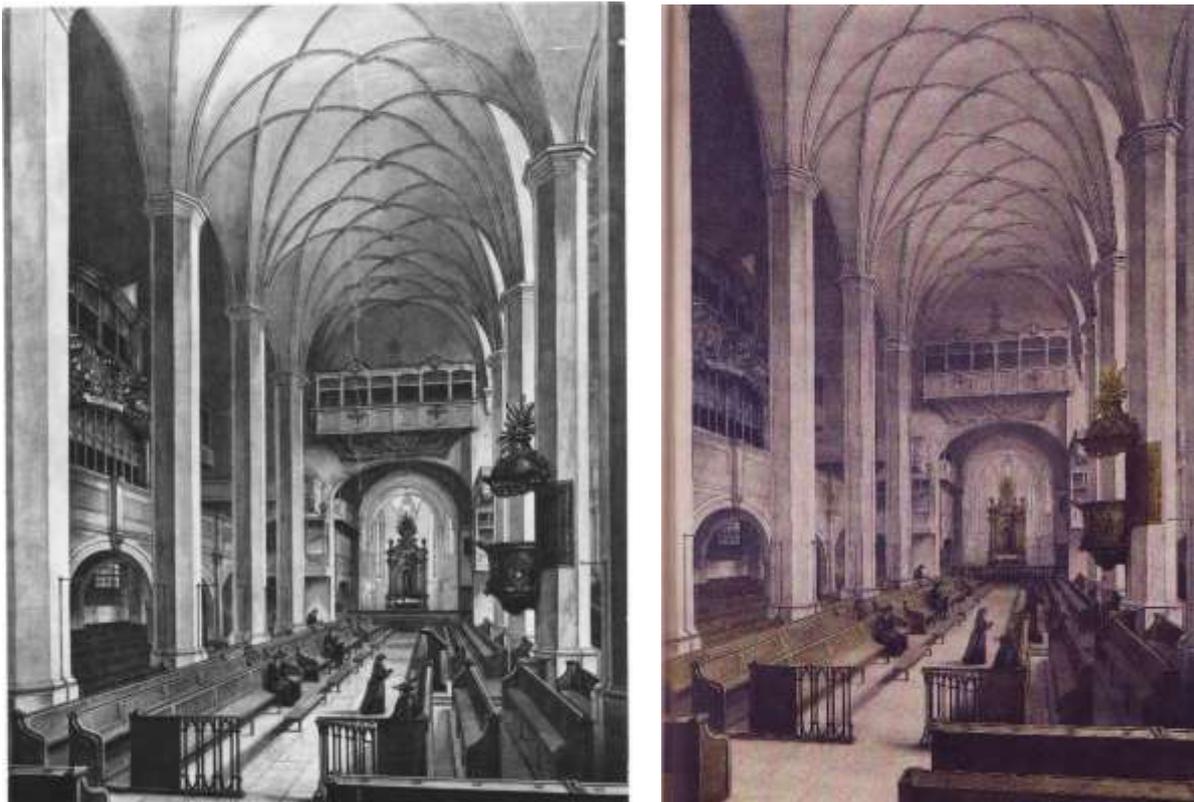


Fig. 5a/b. Interior of the *Thomaskirche* just before the 1884-1888 rebuilding.

Left: anonymous photograph, 1875, Stadtgeschichtliches Museum Leipzig, nr. S/1380/2001.

right: xylography by Hubert Kratz, ca. 1880. Stadtgeschichtliches Museum Leipzig, nr. 2789.

To the left is the *Fürstentstuhl*, in the middle the crossing with private chapels and wooden galleries, behind that the altar choir; in the middle the chapels that were built after the small organ was demolished, and to the right the pulpit. Most Baroque elements had already disappeared.

Besides the outer chapels (as in the *Vorbau* of 1705), which usually had four seats (and from which one could see and hear very little), more and more beautifully decorated private inner chapels (*Betstübchen*) for wealthy families and clergymen were built on the galleries after 1707. Apart from the *Fürstentstuhl* there were no other chapels on the north side of the stone gallery, although chapels in the *Vorbau* had a window towards the nave. In Bach's time the

⁵ Lemper 1954, p. 126; Stiehl 1984, p. 15.

church had 36 chapels, including the outer chapels, offering space for about 200 people. The entire nave was filled with seats, also under the galleries (*fig. 6*). The pews were closed off with doors. Wherever possible, small folding benches (*Bänklein*) were attached. There were about 550 seats for men under the northern and western galleries and in the altar choir, and more than 200 on the northern gallery. Over 800 women could find a place on the benches and folding benches in the nave. Students sat on the southern gallery.

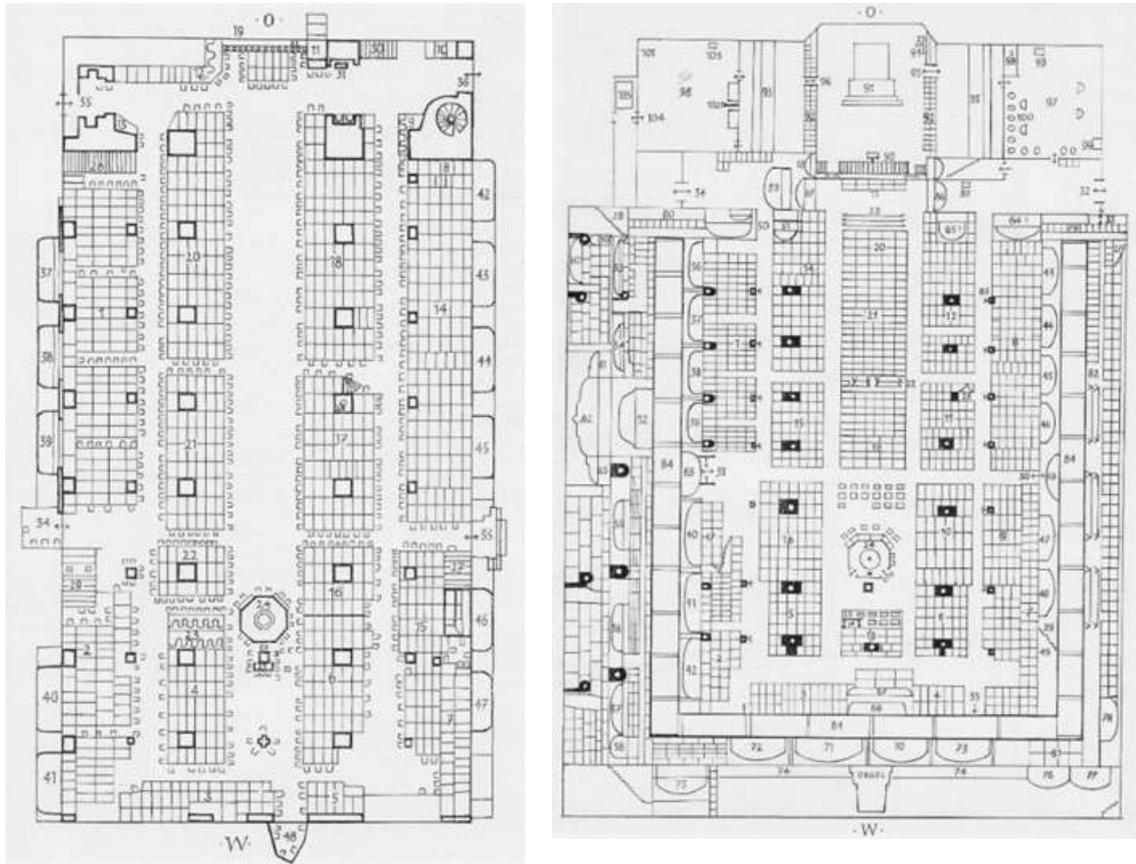


Fig. 6a/b. Floor plans. Drawings by Lotte Schumann after old floor plans.

Left: situation in 1679 (with *Bänklein*). Right: situation in 1780 (with the galleries from after 1773). Stiehl 1984, p. 55, 58.

In Bach's time the church thus contained 2000 to 2100 seats; in addition, standing room was available on the southern galleries. ⁶ Around 1740 various works ("Renovation und Erneuerungen") were carried out, of which it is unclear what exactly was renewed, but in any case this included the step on which the pupils stood during singing, and probably a new stand for the harpsichord. Lecterns and chairs were also replaced. The small organ was demolished and additional private chapels were built on the small organ gallery (*Fig. 5*).

⁶ Stiehl 1984, p. 43f. According to Tanya Kevorkian, the number of seats would have been even higher: in 1708 both main churches together counted 6000 souls. However, it is unclear whether this includes the afternoon services. Tanya Kevorkian, 'The Reception of the Cantata during Leipzig Church Services, 1700-1750', *Early Music* 30/1, 2002, p. 27 and 42.

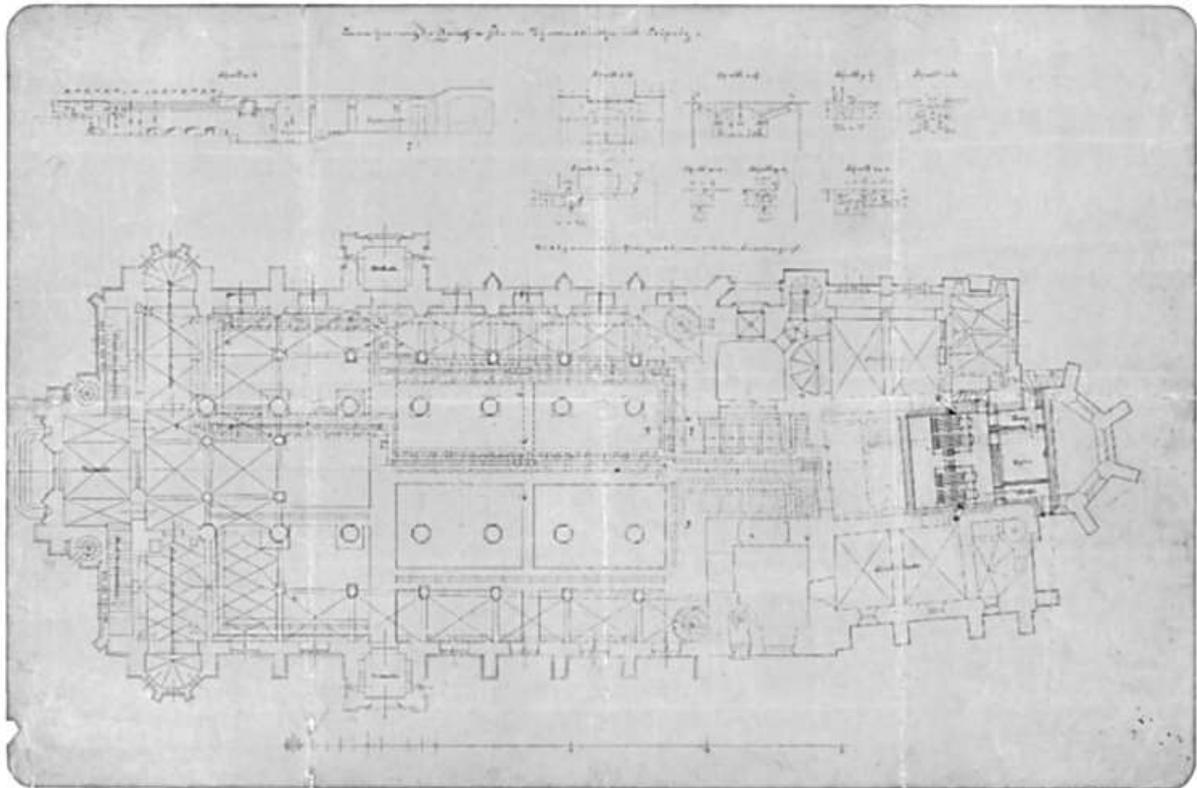


Fig. 7. Floor plan of the *Thomaskirche* for new heating ducts
 Friedrich von Thiersch, 1886-1888, Architekturmuseum der TU München, nr. 16.2.

In 1773, the interior was radically transformed into a more sober style. The organ was rebuilt, moved forwards and provided with a classicistic front; the choir organ (*Rückpositiv*) and balustrade were removed. The *Schülerchor* was radically altered. During the Napoleonic era, when the church was used as a French warehouse, many baroque interior elements were destroyed.

In 1884-1889, the *Thomaskirche* was converted into a neo-Gothic church. On the outside, all Renaissance and Baroque elements were removed. A new neo-Gothic portal was added to the west of the church, lengthening the church by several metres. All the old interior elements, including the wooden galleries, were removed. A new large organ was built by Wilhelm Sauer and placed in the extension. As a result, the music choir was expanded. Apart from the stone elements such as vaults, columns, pillars and the lower gallery, nothing of the old interior was preserved. The contrast between the austere interior in the 15th and 20th centuries and the rich interior at the beginning of the 18th century could hardly be greater. Herbert Stiehl describes the situation in Bach's time as follows:

“If one visualizes the elements that made up the interior of the *Thomaskirche* at the time of Johann Sebastian Bach's directorate, a varied, somewhat restless, but by all means very colourful picture emerges. First of all, there is the furniture, which, with its solid wooden pews and hundreds of folding benches, fills the entire space. Pulpit, baptismal font and *Ratsstuhl* form special features in the nave. There are also stone galleries around the nave, another wooden gallery in the north and more small galleries on the east and west sides of the church hall. The *Fürstentuhl* dominates among the many chapels that were built at various places in the church. On the walls under and above

the galleries, especially on the pillars, hang the Epitaphs of various materials, in varied sizes and with a multitude of paintings, proverbs and reliefs. Many plates with proverbs and paintings have been placed on the stone pillars and transverse galleries. The Altar choir is even more decorated. It is not only home to the elaborate marble altar, but around it also contains paintings, proverbs and sculptures. The paintings of superintendents are spread over both sides of the wall. The stalls for communicants, brides and grooms and priests have been placed in two rows. On the vault ribs meandering stucco work can be seen, and on and around the altar multicoloured curtains, paraments and carpets do their illuminating work. On the western gallery, in the middle and in the background, there is the rather small organ; in front of it is a pedestal. The organ and the pedestal seem to be surrounded by a balustrade. On the left and right side of the *Schülerchor* are two galleries for the city musicians, leaning on pillars. On the stone gallery, in front of the organ and below these galleries for instrumentalists is the place for the choir and its cantor.”⁷

The Thomaskirche was a Gothic hall church, which measured approximately 40 x 25 m inside. Since the end of the 19th century, the interior of the church has been completely different from what it used to be. At the time of Bach, the interior was Baroque, with many wooden elements in addition to the still existing stone Renaissance gallery, including even higher galleries and private chapels. There was room for about 2,500 churchgoers. On the north side the light was taken away by a large 'Vorbau'.

2. How was the *Musikchor* structured?

In this study the *Musikchor* is considered to comprise the entire space in the church from where music was made. In the *Thomaskirche* the *Musikchor* consisted of the organ gallery (with the great organ), two side galleries (transverse galleries) for instrumentalists, and the *Schülerchor*, where the pupils sang. As there are no pictures of the *Schülerchor* or the main organ, we have to rely on descriptions, which are not always clear.⁸

According to Vogel in 1710, the *Schülerchor* was located on the west stone gallery (built in 1570), thus on the first floor, where the large organ was placed against the back wall.^A Since 1632 the *Schülerchor* had had “two side galleries on both sides in the height, one for the *Stadtpfeiffer* (city wind instrument players), and the other for the *Kunstgeiger* (city string instrument players).” Both galleries offered space to ten instrumentalists. On the fronts (towards the church), Biblical scenes (Cain's sacrifice and Abel's murder) were painted "in two fields". The fronts of the balustrade and the two side galleries were provided with six plates with proverbs (Fig. 4). Four plates will have hung on the balustrade, which after all was divided into four fields, and one plate on each side gallery,⁹ probably at the same level as the organ.

Gottlob Friedrich Rothe, sexton from 1772 to 1802, is one of the sextons whose *Aufzeichnungen* provide us with helpful data. In his account of the changes in 1773 he also

⁷ Stiehl 1984, p. 41.

⁸ Computer reconstructions of the organ galleries are printed as Fig. 12a and b.

⁹ Stiehl 1984, p. 31.

provided information on the situation prior to the renovation. ^B According to him, until 1773 the *Schülerchor* was located "up one flight of stairs", i.e. on the first floor, on the stone gallery. This information corresponds to that of Vogel. Next to it, "at the left hand of the same", writes Rothe, three of the four upper school teachers (without the conrector, who acted as *Inspector* in the *Nikolaikirche*) ¹⁰ had their seats, and behind them, against the northern wall, three of the four lower school teachers (the Sextus was *Inspector* in the *Neue Kirche*). On both sides, "one flight of stairs higher", were *Seiten Chöre* (side galleries, which Vogel called "*Emporkirchen*"), where the instrumentalists "used to have" their places; in the meantime they had been transferred to the first floor. Until 1773 the organ stood "up one flight of stairs" on the *Schülerchor* on columns close to the west wall. Various future authors have interpreted this information provided by Vogel and Rothe differently. Arnold Schering believed that the *Schülerchor* was located on the second floor and that the *Rückpositiv* was placed against the balustrade of the *Schülerchor*. ¹¹ Above it has already been concluded that the *Schülerchor* was located on the first floor, and that the organ was placed on pillars. It is highly unlikely that the *Rückpositiv* would hang on the balustrade about five meters further on (see also the discussion below about the Scherer-organ in Stendal). Armin Schneiderheinze looked for space in the back of the *Schülerchor* for a figural choir of twelve pupils, whereas the front part of the *Schülerchor* was reserved for a possibly 100-headed *Choralchor*, also consisting of pupils. ¹² In order to be able to use this space, Schneiderheinze did not place the organ against the west wall, but largely indented behind it. This is not the case with Vogel and Rothe.



Fig. 8. West gallery between the pillars, where the Musikchor was located at the time of Bach.
Photo taken around 1910. Lempfer 1954, p. 97.

¹⁰ E. E. Hochw. *Raths der Stadt Leipzig Ordnung Der Schule zu S. THOMÆ*, Leipzig 1723, p. 30.

¹¹ Arnold Schering, *Johann Sebastian Bach's Leipziger Kirchenmusik*, Leipzig 1936, p. 153f., Table XIII.

¹² Armin Schneiderheinze, 'Bach's Figuralchor und die Chorempore in der *Thomaskirche*', *Beiträge zur Bachforschung*, Heft 1, Leipzig 1982, p. 40f.

It is obvious that the complete *Musikchor* was located between the two rows of columns: these were more than a metre thick, and would otherwise have divided the choir into several compartments, hampering communication (Fig. 8). The total space for music, including the organ, was 9.70 m deep from the west wall to the balustrade, and the space between the two pillars was 8.30 m wide.¹³ Apparently the *Schülerchor* (*Schüler-Chor* or *Sing-Chor*, the space on the stone gallery itself) was closed off on the northern side with a wall, against which the teachers were sitting. Such a wall was probably also present on the south side. This corresponds to Vogel's formulation, who considered the *Schülerchor* a separate gallery (see end note A). These walls will probably not have been very high, otherwise they would have blocked out too much of the incident light. There was little light from the north side of the church anyway, because the *Vorbau* blocked all windows except the most western one. It is possible that these walls were missing at the rear, where the stairs leading down to the choir must have been accessible; that these stairs were also located in the *Schülerchor* itself seems unlikely, as they also gave churchgoers access to the other western galleries.

From the information provided by the other sexton in his *Nachricht*, Johann Christoph Rost, and from the *Schulordnung* of 1723 we can deduce that the singers stood on the stone gallery on the first floor, whereas the instrumentalists had their places in the side galleries and the organ gallery, both standing on pillars.^c According to Rost, who was sexton from 1716-1739, both organ and side galleries were accessible by stairs (plural).¹⁴ Stiehl thinks that on the northern side those stairs were located behind the seats of the teachers, thus near the western wall; on the southern side the location may have been similar.¹⁵

The organ stood close to the back wall. The bellows arrangement and the organ blower possibly had a place in the *Vorbau* of 1628; the *Vorbau* on photographs (Fig. 2) and drawings (Fig. 3a) from before 1884 seems to offer that possibility. Schneiderheinze assumes that the organ was located at a height of ca. 2 m above the stone gallery (according to Rothe, the organ was accessible by "one flight of stairs"), because with an enlargement of the side galleries in 1739, the space under these side galleries remained available for the pupils (see below).¹⁶

¹³ Measured on site by the author on 6 June 2017.

¹⁴ Stiehl 1984, p. 16.

¹⁵ *Ibid.*

¹⁶ Schneiderheinze 1982, p. 40.



Fig. 9a/b. Left: Scherer Organ in St. Marien in Stendal; photo taken before 1940.
www.glockenverein.de/html/bilder.html (accessed 20-07-2017).
 Right: Organ gallery in the cathedral in Merseburg. Photo by G. Freihalter, 2015.

In the St. Marienkirche in Stendal there is an organ from 1580, built by Hans Scherer, the teacher of Johann Lange, who in turn was the builder of the Thomas organ.¹⁷ The organ in Stendal also stood on pillars on top of a gallery. The height of the pillars there seems to have been approximately 2 m. Perhaps it was no different in the *Thomaskirche*. In Stendal there is also an organ platform, there are no lateral choirs; however, there may have been room for instrumentalists left and right of the *Rückpositiv* on the organ gallery (Fig. 9a). During a restoration of the organ in 1940-44 colossal pedal towers were added, which drastically changed the visual character of the organ. Both instruments had a similar number of stops based on a 16' *Principal* on the *Hauptwerk* and an 8' *Principal* on the *Rückpositiv*. A similar situation to Stendal can be found in Merseburg Cathedral (Fig. 9b). The lower gallery was built in 1665, the organ with a wide organ gallery in 1693/1697.¹⁸ In 1863/1867 the space under the main organ and the *Rückpositiv* was closed off after the organ was rebuilt by Friedrich Ladegast in 1853/1855, so that nowadays it is harder to see that the organ is standing on pillars.

¹⁷ Winfried Schrammek, 'Zur Geschichte der großen Orgel in der *Thomaskirche* zu Leipzig von 1601 bis 1885', *Beiträge zur Bachforschung*, Heft 2, Leipzig 1982, p. 47-49.

¹⁸ Tourist- und Tagungsservice Merseburg, *Merseburg, Der Stadtführer*, Wettin-Löbejün 2011, p. 14f.

Transverse side galleries were more common. An example is the organ gallery of the *Peterskirche* in Salzburg with an organ case from about 1680 and side galleries from about 1780 (Fig. 10).¹⁹ In this church the situation was different, in that the organ with *Rückpositiv* did not stand on pillars.



Fig. 10. Organ gallery *Stiftskirche St. Peter*, Salzburg. Photo by Rens Bijma, 2015.

In any case, there was still room for the *Schülerchor* under the organ of the *Thomaskirche* and under the side galleries. This is confirmed by an account dated from 1632, which states that the small side galleries were not only built for the instrumentalists, but also "so that the pupils could hear the sermon better".^D This suggests that the pupils had their seats under these galleries on the *Bäncken* (benches), as they are called in the *Schulordnung* (school regulations) of 1723.^E In 1739, mayor Born had the two chairs "5 and 6" converted into a chapel, and for that purpose had the side choirs enlarged, leaving the space below the same size (see end note C). From the wording it can be concluded that at least two seats for dignitaries were present in the *Schülerchor*, and that they were probably located under one of the two side galleries. If the pupils were indeed seated under one of the side galleries, chairs 5 and 6 may have been located under the northern side choir together with the seats for the teachers (chairs 1-4?).

That the side galleries had a raised back wall, let alone a roof, as suggested by Schering in his reconstruction drawing,²⁰ must be doubted. According to Johann Kuhnau, the instrumentalists "on their galleries on the right hand side" needed a nailed-down shelf on which they could hang their bowed instruments.^F If there had been a back wall, such a shelf would not have been necessary; buttons or the like would have sufficed. The organ was undoubtedly located within the space between the back wall and the first pair of pillars; the side galleries must have stood in front of it on both sides. Because only the eastern sides of the side galleries (towards the church) were painted, and this painting involved only two fields, the galleries must have been standing transverse.

¹⁹ Oral communication with a Benedictine guide in the *Peterskirche*, 2015.

²⁰ Schering 1936, Table XIII.

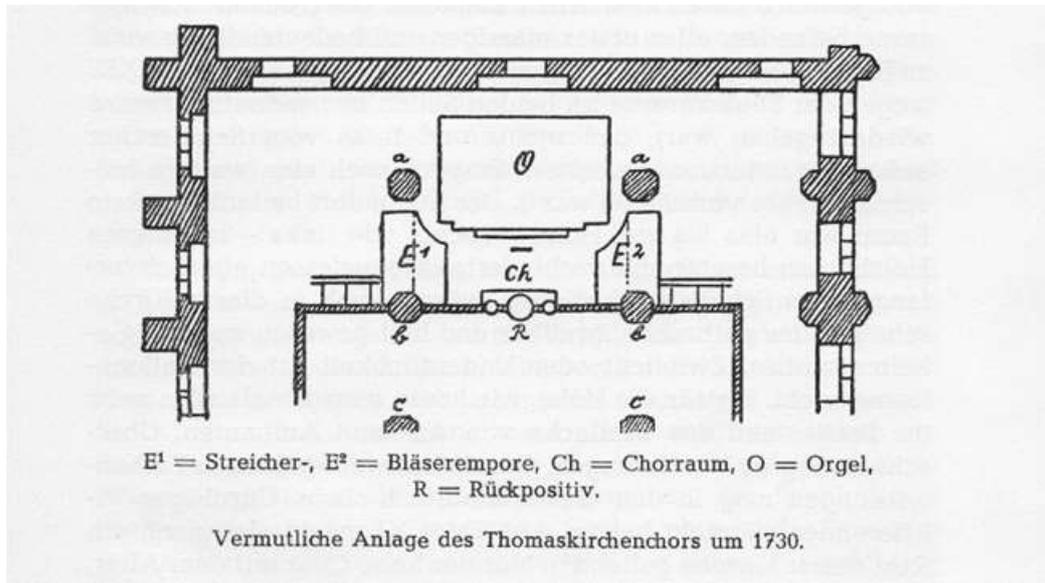


Fig. 11. Schering's reconstruction of the *Schülerchor*. Schering 1936, Table XIII.

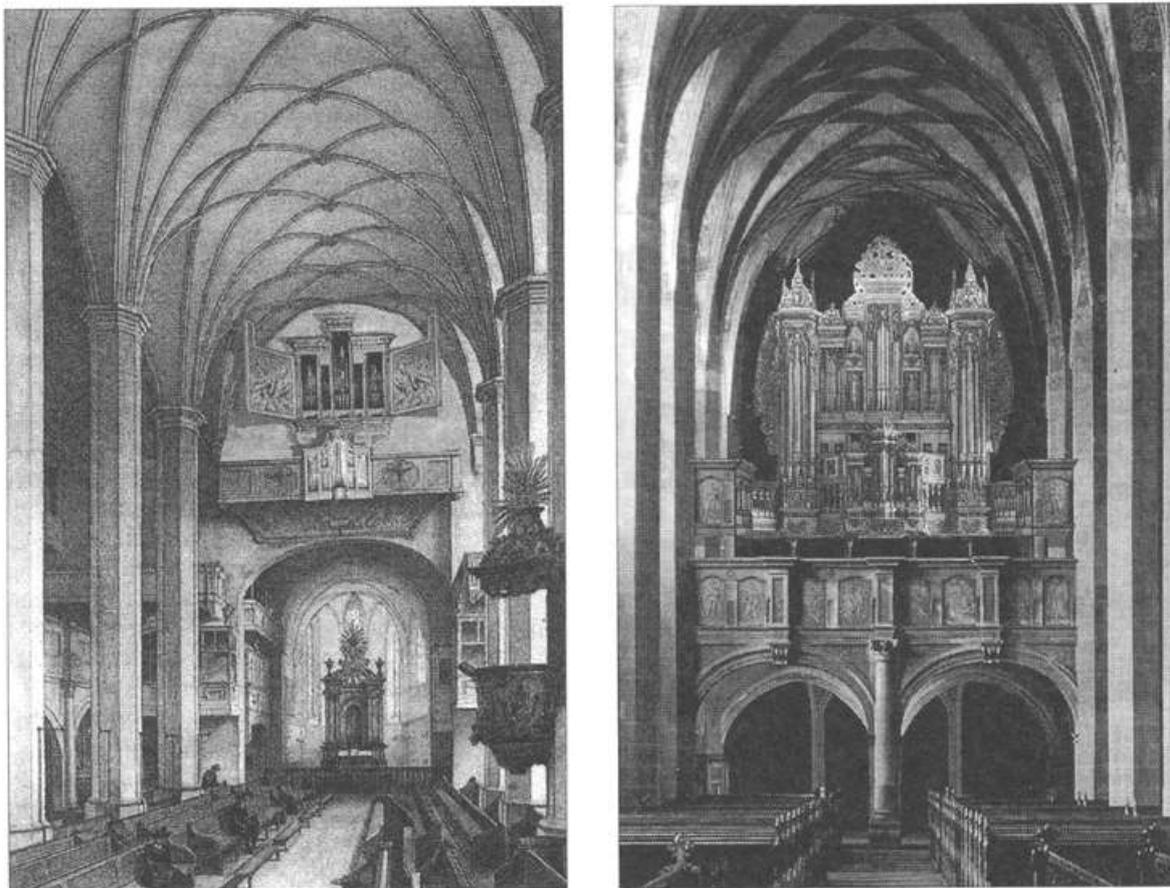


Fig. 12a/b. Computer reconstructions, based on Fig. 5b and a 1910 photograph.²¹
Left: east wall with small organ on the *Schwalbennest*. Right: west wall with large organ, the side galleries and the *Schülerchor*. Evangelical Lutheran Church, Leipzig.

²¹ Apparently, the height of the pillars under the organ was based on Schneiderheinze's estimation of about 2 m; the actual appearance of the organ is unknown.

Several authors state that the side galleries consisted of two rows, because there would hardly have been room for ten players in a 5 m row.²² Assuming that there was room to pass one another and for (fixed) desks, such double side choirs would not have been much less than twice a meter deep. If the musicians stood partly between the first and second column of a column row, as Schering thought, the back row would only have a length of about 4 m (Fig. 11). How the entrance of the back row was placed is in that case a mystery. If, however, both side galleries were positioned more towards the centre, completely between the two rows of columns, they together would take up half of the total width between the columns. Therefore, and because of the walls mentioned above, it would be very dark under those side galleries. The instrumentalists on the back rows would have no view either of the *Schülerchor* below, and therefore no direct contact with the *Music Director* during the performances.

The hypothesis that the side galleries were only one seat deep corresponds to Vogel's information that there were two fields of paintings at the front. With double rows one would rather have expected four fields (cf. Fig. 12b). But then there must have been enough room for ten instrumentalists in each of the two single rows. The following reasoning shows that there was. Between the *Hauptwerk* and the *Rückpositiv* and adjoining them was the organ platform. Records show that this platform was relatively large and was closed off with a balustrade. In the middle, this balustrade must have been intersected by the *Rückpositiv*.²³ Schneiderheinze suggests a depth of 3 to 4 m for organ and platform, which seems quite possible.²⁴ If the side galleries were entirely on the inside of the column pairs, and the whole distance from the *Schülerchor* balustrade to the organ platform was available, the length of the side choirs would have been ca. 6.5 m, which would mean 65 cm space per player. This seems acceptable and all in all the author of this study thinks it is likely that there was only one row of instrumentalists on the side galleries.

Obviously, the side galleries were demolished in 1773, but according to Rothe they were put out of order earlier and the instrumentalists were placed in the *Schülerchor* (see end note B). This must have been after 1750, otherwise it would have been pointless to enlarge the side galleries in 1739.²⁵ In 1669 two oak lecterns (*Pulte*) were placed on the left and right of the *Schülerchor*, with steps for the singers to stand on. These desks were each 4 ells long, which is about 2.2 m. In 1725 the second *Pulte* was repaired; in 1739 all desks were renovated, together with those in the side galleries. In 1739 a new board was mounted at the balustrade, with four desks. According to the *Schulordnung* of 1723²⁶ the pupils must have stood on the balustrade in front of the *Schülerchor* (see end note E). The balustrade was 38 cm deep at its narrowest parts and flat at the top, so the lecterns could be placed on it, possibly at an oblique angle. The width between the pillars is 8.30 m. If the 4 cubits mentioned was an estimation or rounding, the lecterns may have been placed next to each other, leaving room on the balustrade for one long row of singers. The division of the balustrade into four double fields divided by risalits argues in favour of this assumption.²⁷ The height of the balustrade

²² Schering 1936, p. 154; Stiehl 1984, p. 16.

²³ Stiehl 1984, p. 16.

²⁴ Schneiderheinze 1982, p. 40.

²⁵ Dokumente GLT VIII/C/ 78, p. 93; See also end note C.

²⁶ Church accounts 1669, according to Schering 1936, p. 154; 1725: Dokumente GLT VIII/C23, p. 52.; Ibid. VIII/C 78, p. 93; Ibid. VIII/C 79, p. 94.

²⁷ The top of the balustrade is divided into four equal parts of 146 cm each, which are separated from each other by the 82 cm wide cornices on the three risalits (see *Glossary*). Due to the absence of risalits

on the *Schülerchor* side was 94 cm; because of the lecterns with the ca. 35 cm high music sheets on top, the total height was considerably higher. The steps were probably necessary for the smallest boys to reach over the balustrade and lectern. However, it cannot be ruled out that at both ends of the balustrade two desks were standing behind each other.

In the *Schülerchor* there was also a cupboard with a sliding door, made in 1672, in which musical instruments were stored. It stands to reason that this cupboard stood against the back wall, under the organ. In 1729 the cupboard was provided with a new lock when new string instruments were acquired.²⁸ Three years later, another cupboard was installed for the storage of sheet music, such as the parts of the motet collection *Florilegium Portense* by Erhard Bodenschatz. According to Schering, it was placed over a hole in the *Kirchengewölbe* (the church vault), which bore the name *Die Sonne*,²⁹ but which is no longer there. In any case, there was such a *Sonne* in the nave vault at the intersection of diagonal ribs.³⁰ If the west stone gallery also had such a *Sonne*, a place at the junction of ribs at the bottom of the gallery in the middle of the first pair of columns seems the most likely place.

The music choir (the 'Musikchor') was located on the western side of the church, on the stone gallery and between the two rows of columns. It was more than 9 metres wide and almost 10 meters deep. The singers stood at the balustrade, to which lecterns were attached. The organ stood against the west wall, on (possibly ca. 2 m high) pillars. To the left and right two small galleries (side galleries) were placed transversely, which could accommodate up to two times ten instrumentalists. The organ and side galleries were accessible by stairs.

3. How can the acoustics of the *Thomaskirche* be described?

As early as in the 18th century, it was repeatedly noted that acoustics have a great influence on the effect a piece of music has on its listeners. A beautiful performance of a piece for a large ensemble in a large room can sound terrible in a small room, said Johann Joachim Quantz in his *Versuch einer Anweisung die Flöte traversiere zu spielen*, and vice versa.⁶ Johann Mattheson remarked in *Der Vollkommene Capellmeister* that an organ in a wooden church should be able to sound louder than in a stone building.¹¹ And Johann Adolph Scheibe wrote in his *Critischer Musicus* that composers and conductors should take into account the place where they perform their music.¹

According to current understanding, acoustics are primarily determined by the volume of the room and the presence of sound-absorbing materials. Sound-absorbing materials include wooden walls (low tones), carpet (high tones) or porous stone (high tones), as well as listeners. Due to multiple reflections against hard (non-absorbent) walls, such as the plastered walls of the church, it takes a while before the sound is inaudible. The so-called rever-

with cornices on both sides, the two outer fields on the front of the balustrade are about 15 cm narrower than the two inner ones (Fig. 8). Measured on site by the author on 6 June 2017.

²⁸ Stadtarchiv Leipzig, 1729, BD II, no. 272, p. 199; Schering 1936, p. 155; Dokumente GLT VIII/C 51, p. 73.

²⁹ Schering 1926, p. 107.

³⁰ Lemper 1954, Fig. 32, p. 81.

beration time is often used: the time it takes for the sound to decrease in intensity by 60 decibels (dB). A theatre often has a reverberation time of less than 1 s; a large concert hall about 2 s. Large empty gothic churches can have much longer reverberation times (3 to 12 s); baroque churches 3 to 7 s.³¹

The reverberation times depend on the frequency. In Gothic churches, the reverberation time for low frequencies is the longest, leading to darker timbres; in Baroque churches, the midrange frequencies are more prominent, as shown in *fig. 13*.³²

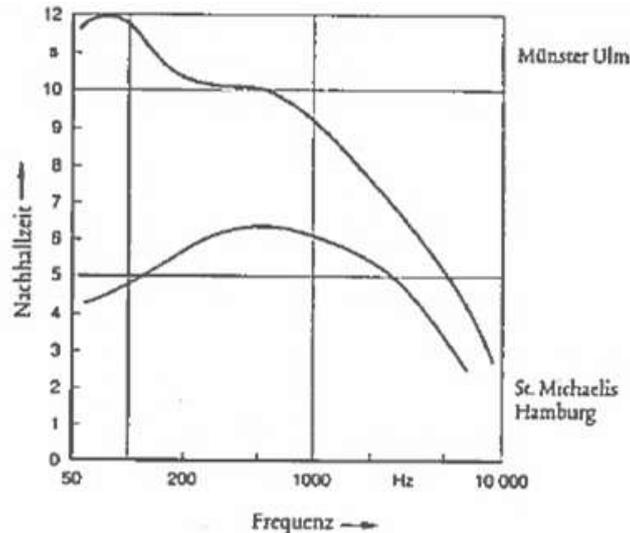


Fig. 13. Frequency characteristics in a Gothic and Baroque church.

A long reverberation time causes sounds to blend into each other. In the case of rapid changes in harmony, this can result in an undesirable sound image. Besides loudness and reverberation, other factors can also play a role in the sound experience, such as the distance to the sound source and the level of the direct sound. Therefore, in order to understand how the composer envisaged the piece of music, it is therefore useful to know what the acoustics were like in the space for which the piece was composed.

The formula for calculating the reverberation time, drawn up by the American Wallace Clement Sabine around 1895, contains a factor that measures the absorption capacity of all surfaces in the room. This factor is not easy to determine. Others have tried to simplify it; in 1965, Dutchman Cornelis Willem Kosten proposed the following formula: $RT = V / \alpha_{eq} \cdot 6 \cdot S$, where S is the area covered and α_{eq} is a factor, the value of which would be 1.07 in a room where the walls and ceiling are made of hard, reflective materials.³³ The formula was later improved by Barron and Beranek, who arrived at a value $\alpha_{eq} = 1.14$.³⁴ In the *Thomaskirche*, $V =$ approx. 15,000 m³; the total area $A = 39.5 \times 24.7 = 976$ m². If approx. 90% of the area is 'covered' with chairs, then $S =$ approx. 880 m². The result of the adjusted formula of Kosten is in that case $RT =$ ca. 2.5 s.

³¹ MGG, Sachteil 7, 1997, p. 901.

³² *Ibid.*, p. 903.

³³ Cornelis Willem Kosten, 'New method for the calculation of the reverberation time of halls for public assembly', *Acustica* 16, 1965, p. 325-330, p. 325f.; private communication with acoustician Diemer de Vries, 2017.

³⁴ Michael Barron, *Auditorium Acoustics and Architectural Design*, Abingdon 1993, p. 2-52.

In 1930 Hope Bagenal thought (wrongly) that there were slightly fewer seats in Bach's time than 1800 (the number of seats in 1930). He also assumed that the *Schülerchor* was positioned on the second floor, and that the vault reflected the sound into the church. The large amount of wood in the church must have caused a relatively short reverberation. According to Bagenal, the reverberation at 500 Hz in a full church should have been 2.5 s and 6.6 s in an empty one.³⁵ At the same time Vern Oliver Knudsen came to reverberation times of 2.2 s and 5.4 s respectively.³⁶ The values of 2.5 and 2.2 s respectively correspond well to the result of Kosten's formula calculated above.

In 1959, Lothar Keibs and Walter Kuhl carried out a more extensive study of the acoustics in the *Thomaskirche* after the rebuilding of 1884-1889.³⁷ Among other things, they measured the reverberation time in the otherwise empty the *Thomaskirche* during a performance with a choir and orchestra that was large by today's standards, as well as in the *Thomaskirche* with an audience of 1600. Table 1 shows the results of their measurements (vertical frequency or pitch in Hz, horizontal reverberation time in seconds).

Table 1. Reverberation times in the *Thomaskirche* at various frequencies measured in 1959 by Keibs and Kuhl.

Frequency band	Reverberation time in church without an audience	Reverberation time in a full church
100 Hz	2,5 s	1,9 s
500 Hz	4,1 s	1,9 s
1000 Hz	3,9 s	1,8 s
5000 Hz	1,6 s	1,5 s

Based on the surviving descriptions of the interior of the church and the watercolour by Kratz from before the renovations at the end of the 19th century, Keibs and Kuhl were able to estimate the differences in materials and their sound absorption properties between the situation in 1959 and the first half of the 18th century. Unfortunately, it is not known exactly which materials and which absorption properties they included in this conversion. At 500 Hz they arrive at a reverberation time of a maximum of 3.0 s in the empty church and 1.6 to 1.7 s in the full church.³⁸

Keibs and Kuhl think that the acoustics of the *Thomaskirche* in Bach's time, because of the abundant wood panelling, the *Fürstentuhl*, the *Schwalbennest*, the chapels, etc., are more in line with the acoustics of today's concert halls than with those of today's churches.³⁹ This would be due, on the one hand, to the absorption of far more low tones than today; on the other, to the greater absorption of high tones through the presence of carpets and textile wall coverings.⁴⁰ There is, however, one important difference: in concert halls there is direct con-

³⁵ Bagenal 1930, p. 14f.

³⁶ Vern Oliver Knudsen, 'Acoustics of music rooms', *Journal of the Acoustical Society* 2, 1931, p. 434-467, p. 424f.

³⁷ Lothar Keibs / Walter Kuhl, 'Zur Akustik der *Thomaskirche* in Leipzig', *Acustica* 9, 1959, p. 365f.

³⁸ *Ibid.*, p. 368; at lower and higher frequencies the reverberation time was probably even shorter.

³⁹ *Ibid.*, p. 369.

⁴⁰ Private communication with acoustician Martijn Vercammen, 2015.

tact between the musicians and the listeners. In Bach's churches, this only applied to the singers. The sound of the singers, who were standing directly at the balustrade, could reach most listeners directly. This is especially important for the high tones, which were more shielded for the instrumentalists seated further away from the balustrade. Therefore the sound of the singers was more direct and louder than the sound of the instrumentalists. ⁴¹

Although the *Thomaskirche* was built as a Gothic church, and after its rebuilding around 1895 was given a Gothic character again, in Bach's time the church had a Baroque character inside. Consequently, the reverberation time was short. Particularly when it comes to low tones, the situation differs from that in many churches today. The sound was transparent, and the acoustics offered the possibility of rapid changes in harmony.

Due to the many wooden interior elements in the Thomaskirche in Bach's time, the reverberation time must have been lower than today. Measurements and calculations show a reverberation time of slightly less than 2 s. Especially the low tones must have been less strong than nowadays. The sound was transparent, and the acoustics offered the possibility of rapid changes in harmony.

Rens Bijma, version 14 December 2021.

With thanks to Albert Clement, Jos van Veldhoven, Martijn Vercammen and Diemer de Vries.

^A Vogel 1710, p. 110.

An der Morgenwand auff beyden Seiten der kleinen Orgel/ wie auch Abendwerts / auff beyden Seiten des Schüler-Chors / sind über den besagten steinernen viel höltzerne Emporkirchen / welche mit Gittern versehen / weiß angestrichen / vergüldet/ und in die Felder Biblische Geschichte / als die Historien von Erschaffung der Welt / Adä Sündenfall [...] mit bunten Farben schön gemahlet und Anno 1666. verfertigt worden sind. Zu denen Emporkirchen ist zu rechnen der **Schüler-Chor**, welcher gegen Abend denen steinernen Emporkirchen gleich gebauet / gewölbet / und von außen gleichfalls mit güldenen Schrifften geziehret ist. Auff demselben sind auff beyden Seiten in die Höhe zwo Emporkirchen / eine vor die Stadt-Pfeiffer und die andere vor die Kunstgeiger An. 1632 [...] jede von zehen Ständen erbauet worden / dar an auswendig gegen Morgen die Geschichte von Cains Opffer und begangenem Bruder Mord in zwey Felder gemahlet ist. Unter dem Glockenthurm sind auch zwey Emporkirchen / deren die eine Anno 1617. [...] steinern / und die andere / so höltzern, weiß angestrichen und vergüldet [...]. Auff dem Schüler Chor ist an der Abendwand die **grosse Orgel** / welche Anno 1525. von dem Guthe die Eiche genandt / besage unterschiedener Jahrbücher / nach Leipzig verkaufft worden / angebauet. Dieses Orgelwerck ist / besage der daran stehenden Jahrzahl, 1601. und wiederum 1670. renoviret und mit einer neuen Baß-Stimmen und Brustwerck vermehret worden.

^B Gottlob Friedrich Rothe, *Aufzeichnungen* (1772-1802); quoted from Stiehl 1984, p. 15.

Concerning 1773:

D. 18. Febr. wurde die durch und durch verbeßerte und fast gantz neu erbaute Orgel zu St. Thomas examiniret [...] Nunmehr wurde zugleich eiene Veränderung des Chores vorgenommen. Vorher war das Schüler Chor eine Treppe hoch und neben demselben linker Hand, [...]

⁴¹ Ibid.

hatten die Praeceptores Superiores der Thomas Schule ihre Sitze, u. hinter ihnen, an der Wand gegen Mitternacht, Praecept. Inferiores. Auf beyden Seiten waren Seiten Chöre angebracht eine Treppe höher, auf welchen ehemals die Instrumentalisten, [...] postiret waren, da die Instrumente ebenfalls herunter gebracht waren, wo itzt der Raths Stuhl befindlich ist. Bey Erbauung der neuen Orgel aber wurde das Schüler Chor eine Treppe höher gebracht und wie schon erwehnet, eine Treppe hoch, dahin, wo erst die Schüler und das Music Chor war die Raths Capelle erbauet. Die Orgel, die vorher auf Säulen ruhte u. auf den ersten Schüler Chor 1. Treppe hoch aufstund, wurden nun etwas von der Wand ab und mehr hervor gerückt.
[...]

Dem 22. Febr. wurde der ehemalige Raths Stuhl der unter dem Tauf Stein zur linken, [...] angebaut war und in zwey Reihen, jede à 6 Sitzen mit schwarzen Leder u. Stahlfedern beschlagenen Stühlen auch Glasfenstern bestund, weggerißen [...]

^c Johann Christoph Rost, *Nachricht deßsen, Was in und Bey der Thomas Kirchen, von Anno 1716, an alß ich Küster worden, vorgegangen, gebauet und verändert worden, auffgezeichnet von Johann Christoph Rosten, Custode Bey der Kirchen zu St. Thomas alhier; Quoted by Stiehl 1984, p. 1: Quoted from Stiehl 1984, p. 16.*

May 1739

[Jacob Born ließ] [...] auf dem Schüler Chor neben einander gehabte Stühle Nr. 5 et 6 zusammen ziehen und eine Capelle daraus machen. Er ließ auch auf seine Kosten die beyden Stadt Pfeiffer Pohr Kirchen erweitern. iedoch unten dem Chor nichts zu schmälern, sondern die weite des Chores unten blieb wie es sonst gewesen sey.

Schulordnung 1723, p. 32ff.

See end note E, § III.

^d Church account of the *Thomaskirche*, 1632; quoted from Schering 1936, p. 154.

2 kleine Borkkirchen zur besser bequemlichkeit der Musik, auch daß die Schüler die Predigt besser hören können.

^e *Schulordnung* 1723, p. 32ff.

CAPUT. XIII. Ordnung des *Chori Musicici* bey dem Gottes-Dienst.

II. So lange auf ihren Bäncken stille sitzen, bis sie zu denen Pulten geruffen werden, so dann aber sich dergestalt vor dieselbe stellen, damit ein ieder den aufgelegten Text sehen, und keiner den andern im Singen hindern möge.

III. Wann die Orgel geschlagen wird, nicht so gleich auf die Bäncke sich niedersetzen, sondern bey den Pulten stehen bleiben, damit sie bereit seyen, das Kirchen-Lied anzufangen, und mit zu singen.

V. Nach geendigtem Gesang mögen zwar der *Præcentor* mit denen, welche den *Bass* und *Tenor* singen, vornen am Geländer stehen bleiben, die übrigen aber müssen sich auf die Bäncke niedersetzen, und die Predigt anhören, auch hernach das öffentliche Kirchen-Gebet mit Andacht verrichten, und endlich wieder zum Gesang an die Pulten treten. [...]

^f Johann Kuhnau, *An E. Hoch Edlen und Hochweisen Rath zu Leipzig unterdienstliches Memoraiäl. Erinnerung des Cantoris die Schul und Kirchen Music betreffend*, 1709, published in Spitta II, p. 856ff.

5. Brauchten die *Instrumentisten* auff ihrem *Chörgen* zur rechten Hand hinter ihnen ein angenehmes Bret, die Geigen auffzuhängen, damit sie solche nicht mehr auff den Fußboden legen, und Schaden dabei besorgen dürfften.

^g Johann Joachim Quantz, *Versuch einer Anweisung die Flöte traversiere zu spielen*, Berlin 1752, p. 280.

Der Ort wo eine Musik aufgeföhret wird, kann der richtigen Beurtheilung sehr viele Hindernisse in den Weg legen. Man höret z. E. eine und eben dieselbe Musik heute in der Nähe, und morgen vom Weiten. Beydemale wird man einen Unterschied dabey bemerken. Wir können ein Stück, das für einen weitläufigen Ort, und für ein zahlreiches Orchester bestimmt ist, am gehörigen Orte aufführen hören. Es wird uns ungemein gefallen. Hören wir aber dasselbe Stück ein andermal in einem Zimmer, mit einer schwachen Begleitung von Instrumenten, viel-

leicht auch von andern Personen ausführen: es wird die Hälfte seiner Schönheit verlohren haben. Ein Stück das uns in der Kammer fast verzaubert hatte; kann uns hingegen, wenn man es auf dem Theater hören sollte, kaum mehr kenntlich seyn.

^H Johann Mattheson, *Der Vollkommene Capellmeister*, Hamburg 1739, p. 460.

§. Eine höltzerne Kirche ist ein solcher Ort, der ein wolangebrachtes, starck-klingendes Orgelwerck erfordert, dessen Pfeiffen meist von Metall sind. Hingegen eine steinerne und gewölbte Kirche kan es mit einem gelindern Wercke bestellen, und viele Stimmen von Holz zulassen.

^I Johann Adolph Scheibe, *Critischer Musikus*, ed. Leipzig 1745, Das 10 Stück, 1737, p. 103.

Die Größe, die Enge, oder der besondere Raum des Ortes, wo die Music aufgeföhret werden soll, nöthiget uns auch, die Instrumentalmusik, welche zur Begleitung, oder Erhebung der Singestimmen dienlich ist, bald schwach, bald stark, bald mittelmäßig abzufassen, nachdem man nämlich gefunden hat, daß der Ort den Schall entweder dämpfet, zurück hält, oder verstärket. Es ist ein großer Vortheil, wenn ein Componist Gelegenheit hat, darauf zu sehen, und wenn er sie zugleich mit Vernunft zu ergreifen weis.