Architectural History Thesis

The differences and similarities between the Renaissance artist; Michelangelo and the Baroque artist; Bernini

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Abstract

This thesis conducts a comparative analysis of Michelangelo and Bernini's sculptures, urban planning works, and architectural works. Contrasts emerge in their interpretations: Michelangelo's David embodies Renaissance ideals of perfection, while Bernini's David exudes baroque dynamism. Both artists drew inspiration from Greek sculptures; Michelangelo idealized the human form, while Bernini embraced emotion and movement. The urban plans reveal similar symmetries but differing spatial philosophies: Michelangelo's enclosed Piazza del Campidoglio versus Bernini's inviting St. Peters Square. In the architectural works, Michelangelo's Sforza Chapel which has a sense of serenity, contrasts with Bernini's narrative-rich ornamentation. Michelangelo's shift towards dynamic expression, influenced by discoveries like the Laocoön group, paved the way for Bernini's further exploration of Baroque aesthetics. This analysis illuminates their distinct contributions within Renaissance and Baroque art and architecture.

Introduction

In the bridging program of February 2023, for a course, we had lectures on architectural history. During one of these sessions, the focus was on Michelangelo Buonarroti (1475-1564). I found his works and principles very interesting at that time and enjoyed delving further into this subject. I wondered: how is it possible that someone who lived 550 years ago is still globally known today? I was disappointed that the exam we had to prepare for contained so little information about Michelangelo. As a result, I am eager to learn more about his work.

Michelangelo was compared to Leonardo da Vinci and Raphael Sanzio, which seems logical as they lived in the same period and could influence each other. To learn more about Michelangelo, I reviewed books about him, exploring his actions and identity. I also examined some of his works, discovering that the statue of David was not solely created by Michelangelo and before him created by Donatello, but also by Gian Lorenzo Bernini (1598-1680). After reviewing books about Bernini, where there were frequent references to Michelangelo, I found that Bernini was often compared to Michelangelo and drew inspiration from his work. In his book, Hibbard (1965) convincingly states that Bernini was compared to Michelangelo and Leonardo da Vinci by others, but Bernini was actually someone who precisely fulfilled the expectations of his time. According to Hibbard (1965), Bernini unquestionably accepted the way things were, which set him apart from his Renaissance predecessors like Michelangelo, who was more complex. In the same book, Hibbard mentions that Bernini did draw inspiration from earlier works of Michelangelo and further developed his own works based on them. This illustrates that Bernini was different in terms of his personality and thinking compared to Michelangelo, but in terms of his works, he did draw heavily from Michelangelo's works and found inspiration for his own creations.

However, Bernini lived a century later, during a time of many new developments, particularly in art. Bernini practiced Baroque art, while Michelangelo practiced Renaissance art, two different styles. The Renaissance and Baroque are often compared, yet they also have their differences. From my personal fascination, the following research question has been formulated: How do Michelangelo and Bernini’s sculptural and architectural styles differ and correspond, and what impact does this have on Renaissance and Baroque art?

To answer this research question, their work is compared in three areas: sculptures, urban planning, and architecture. Firstly, the sculptures of Michelangelo and Bernini are examined and compared. The two Davids are first analysed separately and then compared to each other, exploring their similarities and differences. Michelangelo and Bernini both created multiple sculptures, but I have chosen the two Davids to compare because they depict the same subject with the same story. This allows for a clear examination of the differences and similarities between both artists with distinct styles.

Following that, two urban planning works by the artists are compared. Michelangelo's Piazza del Campidoglio is analysed first, then compared to Bernini’s St. Peters Square, which is also analysed initially. Due to Michelangelo's primary focus on sculptures, paintings, and buildings, I have chosen to select the Piazza del Campidoglio for analysis. Additionally, Michelangelo did not engage significantly in urban planning designs. Similarly, Bernini did not create significant urban planning designs either, although he did design several fountains. In addition to the logical comparison between these urban designs since they were the only works of the two artists, I selected these works for other reasons. Both squares are central public spaces in Rome. The Piazza del Campidoglio served as the political centre of ancient Rome, while St. Peter's Square is located in Vatican City and serves as the forecourt of the most important basilica in Catholicism. By comparing these two squares, the role of architecture in shaping urban space and identity can be examined. Additionally, when I juxtaposed the layouts of both squares, I noticed similarities in their design, such as the use of an oval shape, even without any background information. Because I immediately found the first resemblance in the squares, I chose them for analysis as it is important to select comparable squares for the analysis.

Finally, two architectural works are compared. First, the Sforza Chapel in the Basilica of Santa Maria Maggiore by Michelangelo is analysed, and then compared to Bernini’s Sant'Andrea al Quirinale, which is also analysed first. Before starting this thesis, I was already familiar with Sant'Andrea al Quirinale by Bernini because it is one of his most renowned architectural works. It seemed fitting to choose such a building for this comparison

because this church represents the Baroque style with all its characteristic features. To make a valid comparison, it is important to select a comparable architectural project by Michelangelo. After browsing through some books on Michelangelo's architectural works, I came across several churches designed by him, all of which had a symmetrical layout. However, as I continued browsing, the Sforza Chapel caught my attention because its layout appeared different from Michelangelo's other works, lacking symmetry. At first glance, I immediately noticed similarities in the layouts with Sant'Andrea al Quirinale by Bernini, and I also observed the return of that oval shape in the layout of the Sforza Chapel. By examining these various works, I hope to gain not only a better understanding of the works of Michelangelo and Bernini but also their influence on art history and how they shaped the transition between the Renaissance and the Baroque periods.

Methodology

To answer the research question, various sources will be used and compared. I intend to conduct a literature review using books available in libraries or online resources. The existing literature that I can use focuses on the lives of Michelangelo and Bernini to acquire more information than I currently know about both artists. Additionally, I can read books that delve into the Baroque and Renaissance art in Italy, where likely, Michelangelo and Bernini are featured, since that they were the most prominent figures of their respective art movements during their eras. Furthermore, I aim to juxtapose the various opinions of the authors presented in the books they write about the two artists and examine whether they express similar sentiments and hold the same view on certain matters.

The works of Michelangelo and Bernini are mostly located in Italy, so I cannot access them from here. Therefore, I will conduct a visual analysis using online images, Google Maps views, and images from books. This will allow me to compare various works of Michelangelo and Bernini and examine similarities and differences. I will also extend this analysis to urban planning works and architectural works they both designed.

To gain insights into the artists' intentions, influences, and personal beliefs, a primary source analysis will be conducted. I plan to read Michelangelo's and Bernini's poems, writings, and letters in which their artistic beliefs and principles are articulated. The original poems and letters are preserved in Italy. I think that these poems, writings, and letters may also be compiled in books, allowing me to read and analyse them.

Chapter 1 – The two artists

1.1 – Michelangelo Buonarroti

Michelangelo was born in 1475 in Caprese, Tuscany, and moved to Florence with his parents. He was a painter, architect, sculptor, urban planner, and poet. In Florence, Michelangelo became acquainted with classical antiquity, which influenced his work. When he was a young boy, Michelangelo apprentices under the sculptor Bertoldo di Giovanni, a pupil of Donatello, and the painter Domenico Ghirlandaio, where he learned painting. Through Lorenzo de' Medici, Michelangelo came into contact with some of the great scholars of his time. In 1496, he moved to Rome, where he stayed until 1501. After that, he returned to Florence, where he created the David (Ackerman, 1961).

Michelangelo described sculpture as a process whereby the artist liberates a life or soul from the block of marble. He believed that the sculptor's task was simply to chip away the marble to reveal the ideal form. Michelangelo considered sculpture his calling, and marble was his true element. He often said that he considered himself not as an architect. In a letter he wrote, he stated that architectural aspects arise from the aspects of anatomy, adding that someone who is not a master of the human body is incapable of understanding it. According to Ackerman (1961), anatomy, rather than numbers and geometry, is the discipline of the architect. The parts of a building are not compared to the ideal proportions of the parts of the human body but to the functioning of these parts. The reference to the eyes, nose, and arms suggests the implication of mobility; the building lives and breathes.

The Renaissance

Michelangelo was an artist in the Renaissance period. The Renaissance focused on earthly life and the individuality and uniqueness of humans. There was a shift towards individualism, with the individual person taking centre stage. The foundation of the Renaissance was Humanism, a movement that emphasizes the individual. These Humanists believed that after the Middle Ages, a new period of flourishing had begun with humans at its centre. In Renaissance art, there was an attempt to depict human emotions in paintings and to paint as realistically as possible. Human bodies were studied to accurately replicate life. In architecture, there was a return to classical antiquity, with churches and palaces resembling Greek and Roman temples, and the use of classical orders of columns. in the Renaissance, the human body was compared to architectural elements such as the floor plan and columns.

2.2 - Gian Lorenzo Bernini

Bernini was born in Naples in 1598. In 1605, he moved with his family to Rome. Like Michelangelo, Bernini considered sculpture his calling. However, he was also a painter, poet, architect, and urban planner. Bernini's father was also a sculptor. Bernini often created sculptures meant to be viewed from a certain angle, unlike the Renaissance notion that sculptures should be admired from multiple perspectives. Bernini believed in keeping art and architecture separate, using architecture as a space within which art could be encompassed. He sought to integrate different disciplines to create a unified piece (Hibbard,1965).

The Baroque

Bernini was an artist in the Baroque period. In northern Europe, there was a rebellion against the power of the pope in Rome. The pope defended himself, leading to the Counter-Reformation, aimed at convincing people of the importance of the Catholic faith. The Baroque period employed oval shapes rather than round ones. It built upon Michelangelo’s ideas, making movements even more pronounced and suggestive. While the Renaissance focused on humanity, portraying people in sculptures and paintings as perfect, the Baroque rebelled against the Renaissance's beauty ideals, aiming for a more realistic portrayal of humanity.

Chapter 2 – The works of Michelangelo and Bernini

2.1 – The sculptures

Michelangelo, David, 1501-1504

The statue is named after David from the Old Testament. This hero had triumphed over the giant Goliath with his actions and freed his people from the yoke of the Philistines. With the slingshot hanging around his body, he defeated Goliath. The statue depicts David before the battle. The statue is 517 cm tall and is carved from a single large marble block. At the right foot of David stands a tree trunk, for the purpose of absorbing the forces of the marble and so that the construction of the sculpture stands sturdy. (Grömling et al., 2000). Michelangelo's concept aimed at liberating the life or spirit confined within the marble, a principle that manifested in his sculptural technique. The statue was revolutionary for being the first freestanding colossal representation of a nude figure since antiquity. It assumes a contrapposto stance, wherein the right leg bears the full weight while the left leg remains relaxed. The relaxation of the left leg finds resonance in the positioning of the right arm. Conversely, the right leg and left arm have tension. This brings the statue to life, creating a vibrant figure that appears to be in motion (Sanders, 2020).

According to a study by Della Monica et al. (2019), the entire anatomy of David is perfect, except for one missing muscle on the back. This was not a mistake by Michelangelo, he was aware of the flaw. He mentioned this in one of his letters, explaining that a defect in the marble block made it impossible to reproduce the muscle.

When I observe the statue myself and consider its intended purpose along with the background information, more aspects become clear to me. It is suggested that this is David's posture before the battle with Goliath begins. Without this background information, I would not have imagined this to be the pre-battle pose. It could just as easily depict the aftermath of the battle, with David standing as the proud victor. David's stance appears serene and calm, but when I look at his facial expression, I see that intense and concentrated gaze. It seems as though he is keeping a watchful eye on his enemy with furrowed brows.

The proportions of the statue are also noteworthy. Michelangelo devoted considerable attention to the human body and conducted thorough studies of it. He integrated his observations of the human form into his sculptures, giving them a realistic appearance. However, what stands out about David are the disproportionately large hands and head. In comparison to his feet, it is evident that the hands are oversized, and in comparison, to his torso, it is evident that his head is too large. This seems peculiar since Michelangelo studied the human body and should have been able to accurately depict proportions. A possible explanation for the oversized hands is to express the idea of manu fortis, which means strong of hand, which was commonly applied to David in the Middle Ages (Sanders, 2020).

In Figure 2, the focus is on this hand. Michelangelo has worked with such meticulous detail here, with all the veins visible on the hand, indicating Michelangelo's research into the human body. Additionally, David is depicted without clothing; perhaps Michelangelo chose this approach to portray humanity in its natural beauty.

Figure 1 – Michelangelo, David, Florence, 1504

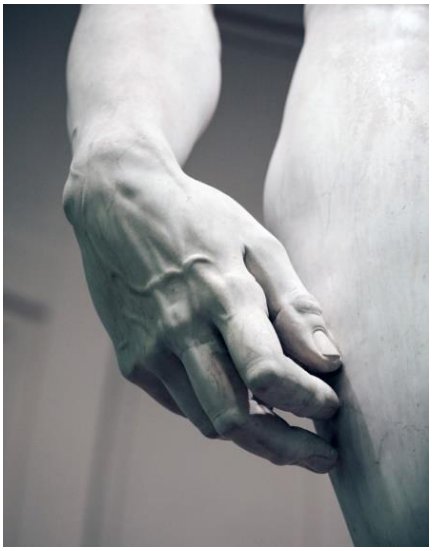

Figure 2 – Michelangelo, the hand of David, Florence, 1504

Figure 3 – Michelangelo, the face of David, Florence, 1504

Bernini, David, 1623-1624

The Bernini sculpture, seen in Figure 4, portrays the same David, but in the midst of the action of the battle with Goliath. At the base of the sculpture, a chain mail is depicted, which David did not wear during the battle with Goliath. Bernini resolved the structural issue by incorporating this chain mail into the structure of the sculpture. The sculpture is intended to be viewed from one side and was therefore placed against the wall. This arrangement was chosen to immerse the viewer fully in the battle scene. The face of David is a self-portrait of Bernini. While sculpting David's face, Bernini maintained this tense facial expression and viewed it with a mirror, then incorporated this exact expression into the sculpture. In the sculpture, David's feet are positioned wide apart, his left arm crosses his body, and his hips rotate, suggesting a swinging motion to achieve maximum momentum upon release of the stone. Bernini achieved this posture through his treatment of the marble not as a solid block, but as a malleable material (Sanders, 2020).

In Bernini's sculpture, the action is clearly depicted. Even without knowing the story behind it, it is apparent that David is in motion and using an attribute to throw. The pouch containing the stones is also prominently featured at the front of the sculpture. This pouch disrupts the diagonal line of the body. David's face clearly shows effort; he is exerting himself to throw the stone. The furrowed brows and tense lips indicate his focus.

The sculpture also demonstrates Bernini's thorough understanding of the human body. David's muscles are visible, and even his ribcage is visible due to the movement he is making. Bernini depicts David draped in a cloth, yet otherwise fully naked, while his chain mail, which he chose not to wear, lies at his feet, and thus serves as structural support. This choice creates the impression that David was truly fearless in the face of his opponent and capable of confronting anything, even without protection. When observing the back of the sculpture and considering that it was intended to be viewed from the front only, this becomes evident to me. Particularly, the chain mail is unfinished, and the back is not nearly as interesting as the front.

Figure 4 – Bernini, David, Rome, 1624

Figure 5 – Bernini, the hand of David, Rome, 1624

Figure 6 – Bernini, the face of David, Rome, 1624

Michelangelo's David in comparison with Bernini's David

Both sculptures depict David. Michelangelo's sculpture portrays David before the battle with Goliath, while Bernini's sculpture portrays David during the battle with Goliath. Michelangelo's sculpture is 517cm tall and is made from a single block of marble. Bernini's sculpture is 170cm tall. Although I have not seen both sculptures in reality, it seems to me that Michelangelo's sculpture is much more impressive due to its height. Both David's are made of marble, but I still notice differences. It appears as though different types of marble were used by Michelangelo and Bernini. Michelangelo's sculpture seems to be more of a matte marble stone, while Bernini's sculpture appears to be very glossy. I find Bernini's sculpture to be less realistic as a result of its high gloss. Additionally, Bernini's sculpture contains black marble spots, which are not present in Michelangelo's David.

Both sculptures exhibit some type of dynamism, but Bernini's sculpture truly captures the action through its pose. Michelangelo was known for depicting God-like humans in his sculptures, portraying humans as perfect. This is evident in his David, who stands in a calm position, observing everything. In contrast, Bernini's sculpture shows the opposite; a man in the midst of battle, displaying his emotions, which may not be as perfect. It is also evident how Michelangelo used the tree stump as a construction element for David, whereas Bernini deviated from this approach by not only making it functional but also incorporating a narrative and decorative element into the sculpture.

The emotion in both sculptures is apparent, but it is difficult to place Michelangelo's David's emotion. David furrows his brows and has a calm and concentrated expression. One might expect more expression prior to a battle. In Bernini's sculpture, the struggle David faces in throwing the stone is clearly depicted. I also find Michelangelo's sculpture to be more realistic in the face, as David has an iris and pupil, giving the sculpture a soul. This is not present in Bernini's sculpture, which feels more distant.

Both artists have drawn upon classical antiquity in their sculptures, but they adopted different elements. The Apollo Belvedere, seen in Figure 7, was an Greek ancient sculpture discovered in Rome in 1489, while Michelangelo began sculpting David in 1501. Undoubtedly, Michelangelo must have been familiar with this sculpture when he started to work on David. In the Apollo Belvedere, there is a static yet contrapposto stance evident, a technique also employed by Michelangelo in his David. Moreover, the idealized male nude seen in Apollo Belvedere is also evident in David. However, Michelangelo's David appears to be more muscular with clearer delineated muscles compared to Apollo Belvedere. This also reflects the Renaissance period's tendency towards the idealization of the human body. it is plausible that during Michelangelo's time, there was a greater understanding of human anatomy, hence the more elaborate depiction of David. Apollo Belvedere is also considerably smaller than David of Michelangelo. Similarly, the hair in David is sculpted similarly to Apollo

Belvedere. The facial expressions differ due to the different stages of a conflict depicted; Apollo, who just released an arrow, displays a calm and relieved expression, while David has an intense expression on his face just before the battle.

In 1506, the Laocoön Group, seen in Figure 8, was excavated, dating back to the second century BC, and Michelangelo was present during this excavation. The Laocoön Group depicts a physical struggle and portrays suffering on the faces of the three men, as Laocoön and his sons are being killed by snakes. This offered a different perspective to artists at the time, contrasting sharply with the static nature of Apollo Belvedere. Although Michelangelo had already completed David when the Laocoön Group was discovered, it is said to have influenced his later works, prompting him to focus more on portraying movement rather the static poses (de Heij, 2011). Bernini´s David, for instance, does not have a static pose and exhibits clear movement. The Laocoön Group likely inspired Bernini as well, evident in the incorporation of movement in his David. However, while the Laocoön Group displays well-defined muscles and idealizes the male body and nudity, these features are less prominent in Bernini's David, which also features a cloth covering David's crotch.

Both artists derived inspiration from earlier sculptures of classical antiquity, aiming not only to emulate but surpass them. Michelangelo and Bernini were in constant competition with their ancient predecessors, who were also sculptors. Undoubtedly, Bernini sought to not only rival Michelangelo but also surpass the achievements of ancient sculptors.

Figure 7 – Leochares, Apollo Belvedere, Vatican City, 2nd century A.D.

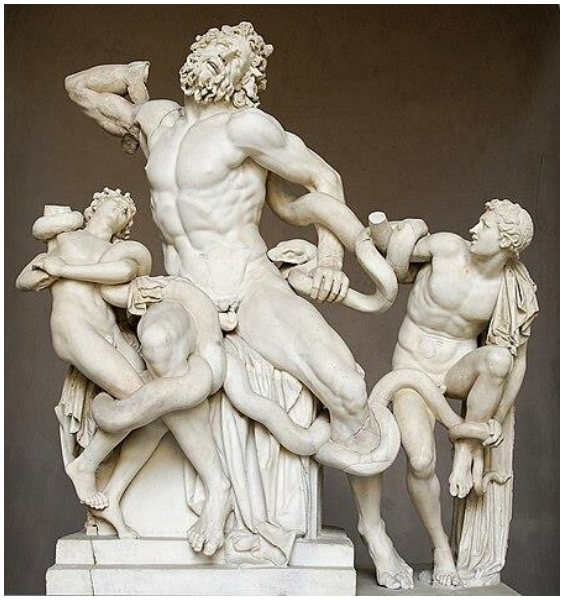

Figure 8 - Agesander,, Polydorus, and Athenodorus, Laocoön Group, Vatican City, 2nd century BC

2.2 – Urban planning works

Michelangelo, Piazza del Campidoglio, from 1538

On the Capitoline Hill stood the most significant Roman temples, and here the triumphal processions of the generals ended. Over the centuries, the Capitol fell into such neglect that by the year 1563, when emperor Charles V arrived in Rome, it was not in a presentable state. Consequently, Emperor Charles V had to disregard the hill. This was likely the decisive factor for the renovation of the Capitol Square. Pope Paul III gifted the Roman Senate with a statue of the Roman emperor and philosopher Marcus Aurelius, this statue was among the most important sculptures of the classical art world. Michelangelo redesigned the square, orienting the Capitolium no longer towards the Roman Forum, but towards St. Peters' Basilica. Michelangelo intended to place this statue on the Capitol. He positioned the statue in the centre of the still uneven terrain, marking the first step towards the redevelopment of the Capitol Square. At the back of the square stood the town hall, where the temple had formerly stood, and on the right side of the square stood another palace. There was no building on the left side of the square yet. Michelangelo planned to construct an identical palace on the left side, mirroring the one already present on the right side (Grömling et al., 2000, p.84).

When I examine the drawing of Piazza del Campidoglio before Michelangelo began working on it (figure 9) and when I look at Michelangelo's drawings of his intentions (figure 10), the first noticeable aspect is, of course, that the building on the left side did not exist yet. Additionally, it is noticeable that in the central building, the bell tower was not situated in the centre. Moreover, the facades on the left and right sides differed. In Michelangelo's design, the bell tower is in the centre, and the left and right facades are identical. Since he also made the palaces identical, he symmetrically designed the town hall to maintain symmetry throughout the plan. In a letter from Michelangelo, he asserts a relationship between architecture and the human body. Stating that the eyes have a resemblance to each other, and the nose is unique (Ackerman, 1961). When considering Piazza del Campidoglio in this light, it is observed that the right building is mirrored to the left side, but central elements are made unique, such as the statue in the middle of the square. Additionally, symmetry is characteristic of the Renaissance. Furthermore, in the Renaissance, frequent references were made to the human body and how everything is based on it (McManus, 2005).

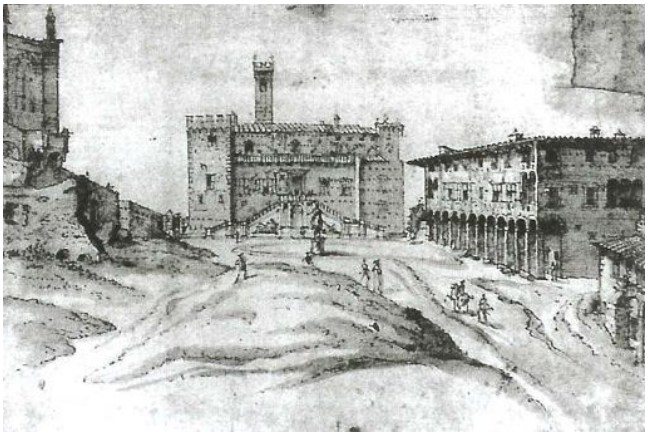

Figure 9 – Piazza del Campidoglio, Rome, c. 1555

Figure 10 – Engraving by Étienne Dupérac, Piazza del Campidoglio, Rome, 1569

When I further examine the plan of the square, my initial observation is how the entire plan appears mirrored and how a clear axis is evident. Looking at the engraving made by Etienne Dupérac in Figure 10, it appears as if there is a circle with decorations in the square, with identical buildings standing at both sides at a 90-degree angle. However, upon closer inspection of Figure 11, which depicts a floor plan, it is evident that the entire plan diverges in a sort of manner. The circle in the middle no longer appears to be a perfect circle but rather an oval. Additionally, the two buildings on the sides are not positioned on the square at a 90-degree angle but are placed at an 80-degree angle, seemingly extending with the circle. The flared facades of the flanking buildings create

an anti-perspective effect, making the piazza appear almost square. By mirroring the building on the left exactly on the right, a trapezium shape was formed. Fürst (1998) states that the trapezium shape of the piazza makes the central main building, the Senator's palace, appear taller, slimmer, and more impressive. As the visitor ascends the Cordonata, which are the stairs that lead up to the capitol hill, they feel as though they are being drawn into and embraced by the space due to its trapezium shape. Upon entering the piazza via the Cordonata, the route is barricaded through the centre by the statue placed in the middle of the piazza, prompting the visitor to move left or right. Continuing their journey and looking down at the stellate pattern, the visitor perceives a suggestion of movement on the floor. Subsequently, as the visitor proceeds towards the senator's palace, they must choose whether to ascend the stairs on the left or the right, those stairs were also designed by Michelangelo. Incorporating these aspects into the plan suggests movement.

As described in the first paragraph, the building on the left side was initially absent. Michelangelo had this building constructed on the left side, and it appears to be an exact replica of the building on the right side. Consequently, the square gains unity, and it seems as if it is perfectly mirrored. By adding the left building, the square is unlocked in the middle by what can be considered as three walls. This is why the facades of the buildings only point towards the square and extend around the corners only to the extent of two axes. The only side of the square that is entirely open has a staircase, the Cordonata where the hill can be entered. The three walls that unlock the ‘room’ are three separate walls and are not connected to each other. Therefore, one can exit the square through the four ‘legs’ of the trapezium. In images taken of the square itself, it is almost impossible to see that it is not a circle, but trapezium-shaped.

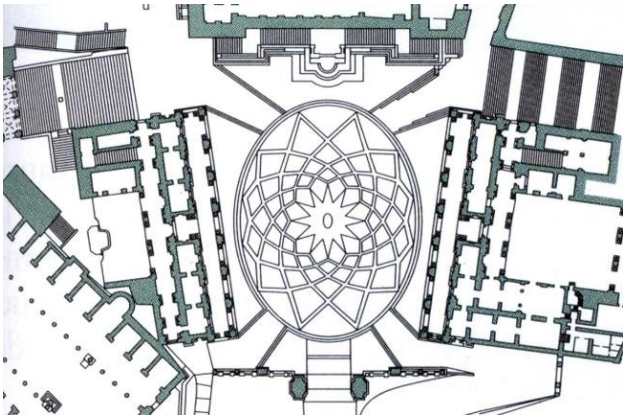

Figure 11 – Michelangelo, Piazza del Campidoglio floor plan, Rome, 1567

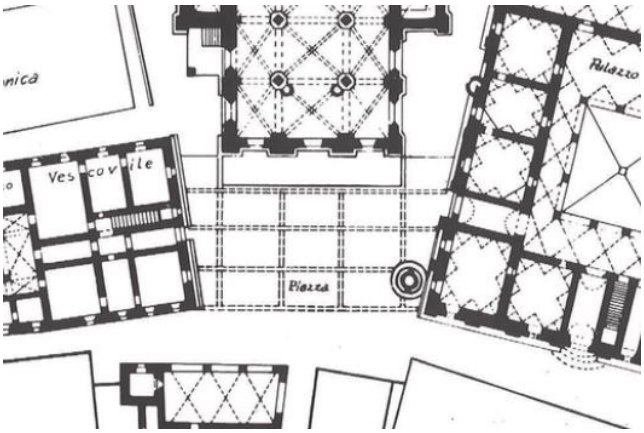

Figure 12 – Bernardo Rossellino, Pienza, cathedral square plan, Pienza, 1456

Figure 13 – Michelangelo, Piazza del Campidoglio, Rome, 1567

Ackerman (1961) convincingly states that traditionally, before the time of Michelangelo, it was common to treat squares in straight-line patterns or in a grid format. Ackerman refers to a project by Bernardo Rossellino; Pienza, Cathedral Square, see figure 12. It can be observed that at the bottom of the square, a grid of lines is laid out. Buildings on both sides of the square are positioned at an angle, similar to Piazza del Campidoglio. The author argues that it was not possible to apply the same pattern to the trapezium shape in Piazza del Campidoglio. My question is why the author claims this was not feasible, as the buildings in Piazza del Campidoglio are also angled and form a trapezium shape. In Bernardo Rossellino's project, the buildings are also positioned at an angle, and the square forms a trapezium, similar to Piazza del Campidoglio (Ackerman, 1961). On the other hand, Fürst (1998) suggests that this pattern of lines on the Pienza square is a disruptive element, so Michelangelo did not want to use it in Piazza del Campidoglio and was looking for an alternative solution.

Bernini, Saint Peter's Square, from 1656

In 1656, Bernini was commissioned by Pope Alexander VII to design a square primarily intended to provide enough space for the many pilgrims who had come to Rome to see the Pope. Yet another important ceremony was the Pope blessing the people of Rome during easter, delivered from the benediction loggia above the central entrance, extending the blessing globally; this means it is given *urbi et orbi* (Wittkower et al., 1999). Therefore, the façade of St. Peter's Basilica needed to be clearly visible, as did the pope himself. Bernini likened the square to the outstretched arms of the church welcoming the faithful, imbuing this architectural creation with both a human and sculptural significance and function. The intention was to welcome the pilgrims who had undertaken the journey as if they were being embraced by the oval shape, which resembles the 'arms,' drawing them towards St. Peter's Basilica. At the centre of the square stands an obelisk, this Egyptian obelisk was erected in the square around 1586 by the order of Pope Sixtus V. On both sides of the obelisk are fountains present. The fountain on the right when the visitor enters the square was designed by Carlo Maderno in 1612. To maintain balance and symmetry in the square, Bernini also constructed an additional fountain to the left of the obelisk (Hibbard, 1965).

Figure 14 – Bernini, Saint Peter's Square aerial view, Vatican City, from 1656

Figure 15 – Bernini, Saint Peter's Square obelisk, Vatican City, from 1656

Between the obelisk and each fountain, there are white marble discs with a granite centre, which mark the centres of each colonnade with the text: Centro Del Colonnato, see Figure 16. When standing on the disc, only the first row of columns is visible. Additionally, the obelisk serves as a sundial. Starting from the obelisk towards the fountain on the right, white marble discs are used as sundial markers for the obelisk. On each disk, two dates are engraved to indicate when the noon shadow of the obelisk will reach this spot. There are also four discs representing the compass points as 'wind' (Carlini & Magrone, 2017).

Figure 16 – Bernini, white marble discs, Vatican City, from 1656

Figure 17 – Fountains, Vatican City, from 1656

In earlier depictions of Bernini's design (figure 18), it is evident that the final design underwent alterations. Bernini's original design featured a small opening through which, upon passing, one could view the expansive square. However, this design could not proceed because it was not safe due to the flight of the many people in the square. Instead, he created an additional square behind these openings, known as Piazza Rusticucci, to serve as a modest forecourt for the oval square. Additionally, this adjustment aimed to enhance the symmetry of the design. As a result of this modification, the square seems divided into three sections, rather than the two originally envisioned (Wittkower et al., 1999). Figure 19 illustrates the current appearance of the square, showcasing a central promenade. Upon approach, both the building and the square are visible from afar, eliminating any element of surprise for the visitor. The addition of the long avenue occurred after the death of Bernini, contrary to his intentions.

Figure 18 – Bernini, earlier design, Vatican City, from 1656

Figure 19 – Bernini, Piazza Rusticucci, Vatican City, from 1656

When observing the square, it is noticeable that the columns stand in rows one behind the other. These columns enclose the square with a sort of wall from the outside, giving the impression that the "arms" proved a form of protection to the visitors of the square. The arrangement of the columns in rows, with the rest being open space, also gives it a sense of transparency as one can walk through them. Additionally, the square itself is oval-shaped, while the square in front of the entrance to St. Peter's Basilica is trapezoidal. Piazza Rusticucci appears to be an extension of the trapezoidal square in front of St. Peter's Basilica, and the oval square in the middle interrupts the straight line of the squares. Beneath the forecourt, Bernini laid out an oval shape widthwise instead of lengthwise, creating an optical illusion that brings the facade of St. Peter's Basilica closer to the visitor. Visitors entering the square from the east side immediately see St. Peter's Basilica in the centre, leaving a strong impression on them.

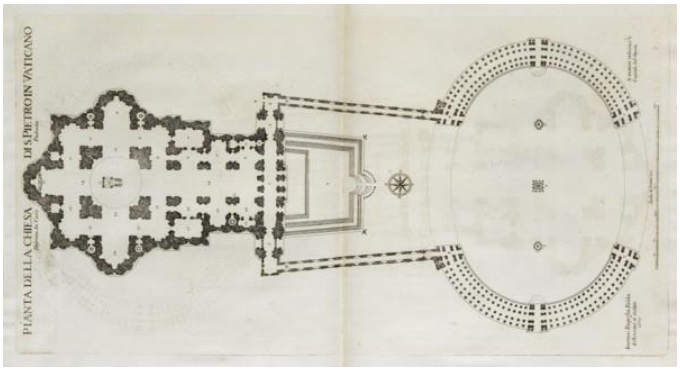

Figure 20 – Bernini, Saint Peter's Square floor plan, Vatican City, from 1656

Figure 21 – Bernini, Saint Peter's Square colonnades, Vatican City, from 1656

Fürst (1998) states that the four rows of freestanding columns are transparent and open, allowing access to the square from all sides. I checked the square on Google Maps and noticed that the rear row of columns, bordering the street, is closed off with fences and can no longer be accessed. I am unsure of the year this was done and whether it was Bernini's intention. As a result, the square can now only be entered from the main entrance, with visitors entering along the short axis of the oval and immediately facing the distant facade of St. Peter's Basilica. Even though enclosing the square with fences may not have been Bernini's initial plan, it has strengthened the relationship between the short side of the oval and St. Peter's Basilica, and when visitors enter the square, the St. Peter's Basilica is the first thing they notice.

It is interesting to read that the square serves not only a public function but also that Bernini contemplated mathematics and applied a sundial. Additionally, he incorporated the central point of the colonnades into the square. One characteristic of Baroque art is the strong contrast between light and dark; did Bernini aim to emphasize the light (the sun) and dark (the shadow of the obelisk) with the sundial? The fountains beside the obelisk are aligned with the obelisk. The fountain later designed by Bernini has the exact same appearance as the one designed in 1612. This reinforces the image of symmetry in the square. Besides being mirrored in length, it also appears that the square could be mirrored in width, as the obelisk and fountains are aligned. On the same line on both sides, in the middle of the colonnades, there is a portico. Upon further inspection of the square's ground, it is evident that the line of the sundial does not run exactly in the middle of the obelisk, fountains, and portico, making the square not appear perfectly mirrored. This is likely due to the square not being precisely oriented along the cardinal directions.

Michelangelo's piazza in comparison with Bernini's piazza

Both squares are situated in significant locations; on Capitol Hill, the most important buildings of Rome stood, while at the end of St. Peter's Square stands St. Peter's Basilica. Consequently, both artists extensively thought about how they wanted to shape the squares. In the square I observe many similarities, starting with their plan. Both squares are oval-shaped, with Piazza del Campidoglio having an oval length, and St. Peter's Square having an oval width. This means that when you enter as a visitor, you immediately see the building. One characteristic of the Baroque period is the use of ovals in buildings and squares, while in the Renaissance a perfect circle was mainly used. Michelangelo deviated from this perfect circle in Piazza del Campidoglio. This demonstrates that Michelangelo considered it much more important to create a coherent plan than to adhere strictly to the 'rules' of the Renaissance. Both squares also incorporate a trapezoidal shape, likely inviting visitors to a square, and making the central building appear taller and impressive. The resemblances of the oval shapes and trapezoidal shapes can be seen in Figure 22, where the two floorplans are placed side by side. Here it can also be observed how in Piazza del Campidoglio, the square is surrounded by three separate buildings, and the porticos of the buildings on the left and right create openness. This openness is also evident in St. Peter's Square, where the four rows of columns provide transparency and allow people to walk through. However, visitors can only enter

St. Peter's Square from the front, as closed gates have been placed between the last row of columns. In contrast, Piazza del Campidoglio can be entered from multiple sides.

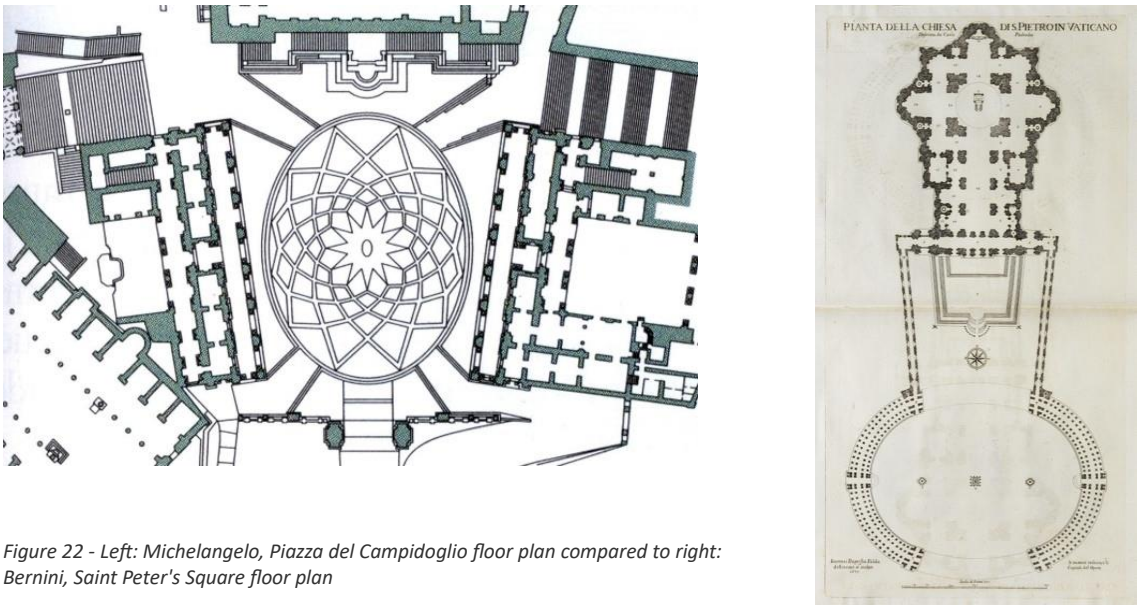

Figure 22 - Left: Michelangelo, Piazza del Campidoglio floor plan compared to right: Bernini, Saint Peter's Square floor plan

Both squares are symmetrical with one central remarkable feature, which leads to the statement Michelangelo made about the connection between architecture and the human body (McManus, 2005). Bernini believed that classical orders were based on human proportions, considering painters and sculptors to be the best architects due to their study of the human body (Wittkower et al., 1999). These statements indicate that both artists were inspired by human proportions in their work. A characteristic of the Baroque period is its continuation of Michelangelo's ideas, with movements becoming even more suggestive and expansive in their portrayal. In Piazza del Campidoglio, the central point is the statue, while in St. Peter's Square, it is the obelisk. Additionally, the obelisk serves as a sundial, not just as a central point for observation but also with a scientific background. Later additions were made to both squares to enhance symmetry. Initially, the left building was absent in Piazza del Campidoglio, which Michelangelo later added. Similarly, in St. Peter's Square, the left fountain was initially absent, and Bernini later had it built. The result was symmetry on both squares.

These various aspects reveal that the squares share many similarities, and both artists had similar thoughts. The main difference is that Piazza del Campidoglio is oval-shaped lengthwise, while St. Peter's Square is oval-shaped widthwise. Additionally, the scale of the squares is different. St. Peter's Square is considerably larger than Piazza del Campidoglio, presenting an additional challenge for Bernini. In Piazza del Campidoglio, it appears as though it is one square unlocked by the three 'walls', and at St. Peter's Square, it seems to consist of three different parts, with one part also unlocked but with 'arms', as Bernini described them.

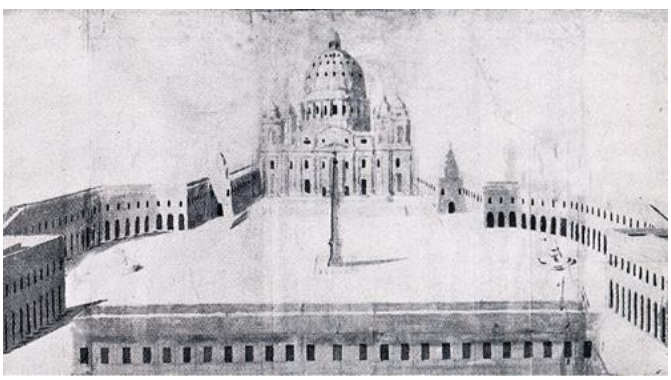

Figure 23 – Carlo Rainaldi, Saint Peter's Square drawing, Vatican City, 1646

Figure 24 – Carlo Rainaldi, Saint Peter's Square model, Vatican City, 1646

Fürst (1998) states that the trapezium shape of Piazza del Campidoglio makes the central main building appear taller, slimmer, and more impressive. Furthermore, Fürst (1998) claims that Bernini adopted the shape of Piazza del Campidoglio in the design of St. Peter's Square for the same reason. However, Wittkower et al. (1999) argue that the forecourt, Piazza Retta, was designed for topographical reasons. The position of the old entrance to St. Peter's Basilica determined the shape of Piazza Retta. Bernini had to utilize the existing north wall for the new Scala Regia staircase. Only by creating Piazza Retta in this form was it possible to widen the square. Moreover, Fürst (1998) states that Bernini adopted and further developed the plan for St. Peter's Square as well as the plan for Piazza Retta from an earlier design by Carlo Rainaldi, see Figures 23 and 24. By employing a trapezium shape, Bernini made the facade of St. Peter's Basilica appear less wide, as he found the facade designed by Maderno to be too broad. This again echoes Fürst's (1998) assertion that Michelangelo, through the use of a trapezium shape, made the central building appear taller and narrower, a concept Bernini adopted in St. Peter's Square.

2.3 – The Architecture

Michelangelo, Sforza Chapel - Basilica di Santa Maria Maggiore, 1561

Michelangelo designed the chapel when he was 87 years old in 1561 in the Basilica of Santa Maria Maggiore. It was intended for a nephew of Pope Paul II., Cardinal Ascanio Sforza. The interior is made of the material travertine, an unusual material for an interior according to Fürst (1998). This is the only building where Michelangelo incorporated his late concept of space. The dimensions are unusually large for this type of building. Typically, the proportions would only be used for a square or cross-shaped plan, and Michelangelo shortened this cross. In the floor plan in Figure 26, you can see how the walls bend on the side, and in the centre, in the 'extension' of the cross, stands the altar in a separate space. Here the width of the tunnel vault is bigger than its depth. Free-standing columns are present, and they stand in front of the diagonal surfaces of the cross pillars. Large blocks are placed between the narrow arches and the tops of the columns. Their cornices continue along the walls in a flattened form (Lotz & Howard, 1974). Towards the protruding lateral parts, the pillars are symmetrically surrounded by other columns of the same order supporting their own arch. This ensures that the weight of the vaults is evenly distributed between the eight columns and the four intermediate pillars. This construction system Illustrates a change in Michelangelo's architectural thinking. In Michelangelo's earlier works, the columns were embedded in the wall, and in the design of the Sforza Chapel, the columns have been detached from the wall (Frommel, 2007).

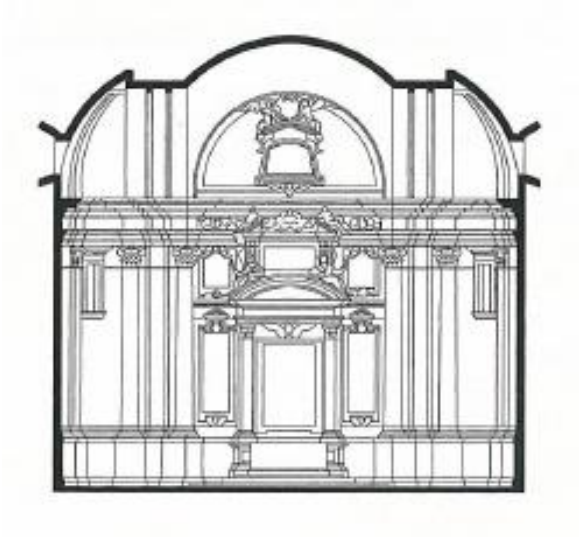

Figure 25 – Michelangelo, Sforza Chapel section cut, Rome, 1561

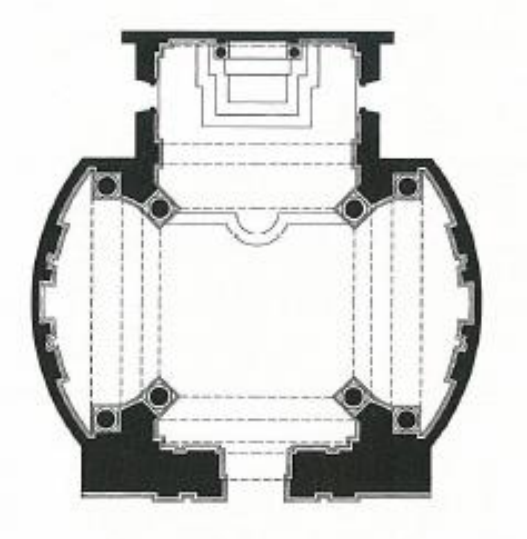

Figure 26 – Michelangelo, Sforza Chapel floor plan, Rome, 1561

When I examine the photographs, I notice a limited use of colour in this chapel, in contrast to other chapels within Basilica Santa Maria Maggiore. Additionally, there are very few photographs of this chapel to be found, as photography and videography are generally prohibited. Therefore, it is more difficult to analyse the chapel myself. Notably colour is only present at the altar, which might suggest Michelangelo's intention to draw attention solely to the altar, rather than the surrounding space.

In Figure 27, the altar is depicted. I notice that the wall of the altar contains four rectangular windows, and the window reveals seem to be directed towards the altar. I think this was done to illuminate the altar with daylight, thus drawing attention to it. Above the entablature, there is an additional trapezium-shaped window. This choice of shape may have been made to achieve a similar effect as with the deep reveals, further accentuating the prominence of the altar.

The length and width of the floor plan are equal, just like in a Greek cross. The location where the Greek cross intersects has been shifted towards the entrance, which was done because otherwise, too little light would enter the chapel. This chapel is situated in the Basilica of Santa Maggiore, so there was little daylight coming in from both the entrance and the sides. Therefore, Michelangelo extended the intersecting part of the cross. This resulted in the floor plan of this chapel not being perfectly symmetrical, which was important in Renaissance architecture, and thus, it was not appreciated. The location where the altar stands was the only place where light came from, so Michelangelo sort of extended the altar to the entrance (Ackerman, 1961).

By deviating from traditional rectangles in the floor plans, Michelangelo created a dynamic image where the visitor is immediately confronted with the central altar upon entry, but attention is also given to the altars on the sides. These side altars do not dominate the entire scene, and attention still gravitates towards the central altar. The four central columns are positioned in such a way that they participate in the central space, giving the columns an active role in the chapel. This allows the side altars to also receive attention without detracting from the central altar. Additionally, I believe the central altar receives the most attention because it is directly opposite the entrance, and there are windows in the wall that naturally illuminate the altar.

Figure 27 – Michelangelo, Sforza Chapel altar, Rome, 1561

Figure 28 – Michelangelo, Sforza Chapel interior, Rome, 1561

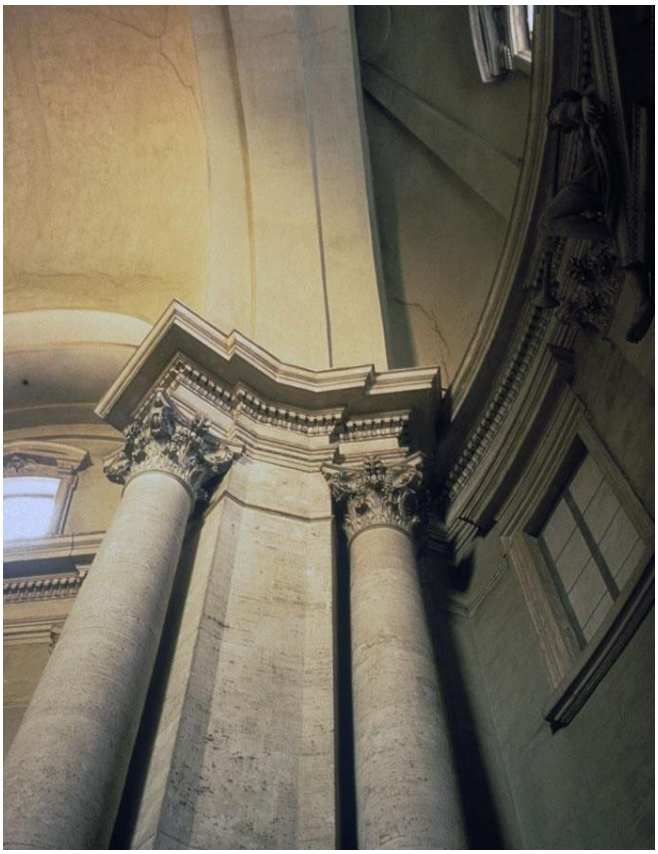

Figure 29 – Michelangelo, Sforza Chapel columns and cornice, Rome, 1561

Bernini, Sant'Andrea al Quirinale, 1670

The commission to build this church came from Cardinal Camillo Pamphili in 1658 who desired a church for the novices of the Jesuits. Due to the character of the site and the limited space available, Bernini opted for an oval plan. The design of the church is based on the Pantheon (Fürst, 1998). By creating an oval shape instead of a circle, as seen in the Pantheon, Bernini gives the space a more dynamic form. In figure 30 it can be seen that the facade is tall and narrow with steps in front, an unusual choice resembling more of a monument entrance. The curved walls surrounding the church guide the visitor towards the entrance, drawing them inside. It feels as if the church embraces the visitors with two arms, the same as in St. Peter's Square. The layout of the church is elliptical, with visitors entering from the shorter side and immediately facing the altar. This shows that the central altar was the most important part of the church. The space containing the altar is set slightly back, with

two pairs of columns in front seeming detached from the rear walls, the outer columns seem like they are not fully in front of the pilaster behind them. The lower part of the church is dimly lit, while the chapels along the transverse axis are softly illuminated. Those along the diagonal axis remain unlit, shrouded in darkness, indicating their varying levels of importance. The higher one looks, the brighter it becomes due to the windows above the cornice (Wittkower, 1999).

Figure 30 – Bernini, Sant'Andrea al Quirinale exterior, Rome, 1670

Figure 31 – Bernini, Sant'Andrea al Quirinale interior, Rome, 1670

The visitor who enters and looks at the altar is, so to speak, guided by the decorations and sculptures to look upwards, ultimately reaching the ceiling where a skylight is present, allowing light to come through. This light symbolizes the divine light, much like in the pantheon. The architecture, sculptures, colours, paintings, and decorations collectively form a religious drama, telling a story. Bernini did not work as a traditional architect but utilized architectural elements for specific purposes. He believed that architecture should be the background of the sculptures and should now overshadow decorations (Hibbard, 1965).

There is a reversal in the direction of movement between the exterior and interior of the church. Externally, the cornice appears to move towards the visitor over the oval body of the church, inviting them to rest in the portico. Internally, the movement is in the opposite direction, leading away from the entrance. This can be seen in the floor plan in Figure 32. The isolated altar room reacts inversely to the prominent portico, signifying their differing functions- the latter invites while the former excludes believers. This creates a contrast between the exterior and interior, representing 'positive' and 'negative' realizations of the same theme (Wittkower, 1999).

The use of an oval floor plan where the transverse axis is longer than the main axis between the entrance and the altar was not new. In Santissima Annunziata, Parma, designed by Renaissance architect Giovanni Battista Fornovo in 1566, the architect also used an oval shape for the floor plan, see figure 33. At the ends of the transverse axis are chapels present. In Bernini’s church, this is done differently, with pillars instead of chapels along the same transverse axis, directing the visitor's gaze directly to the central altar upon entry, rather than allowing it to wander to the sides.

Figure 32 – Bernini, Sant'Andrea al Quirinale floor plan, Rome, 1670

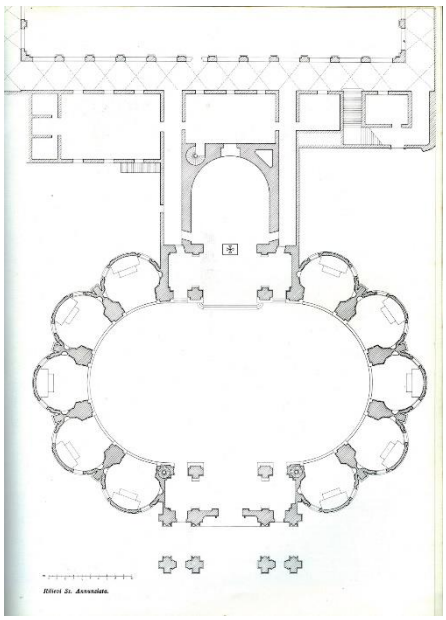

Figure 33 – Fornovo, Santissima Annunziata floor plan, Parma, 1566

Michelangelo's chapel in comparison with Bernini's church

In Hopkins' book (2002), the author asserts that it is not surprising that Borromini, an artist from the Baroque period, admired and was influenced by Michelangelo above all other architects. It can even be said that Borromini understood, explored, and developed the Baroque spatial forms that were latent in Michelangelo's late Sforza Chapel, which had remained untapped since the 1560s. Since Bernini lived in the same era as Borromini, the same can be said about Bernini as well.

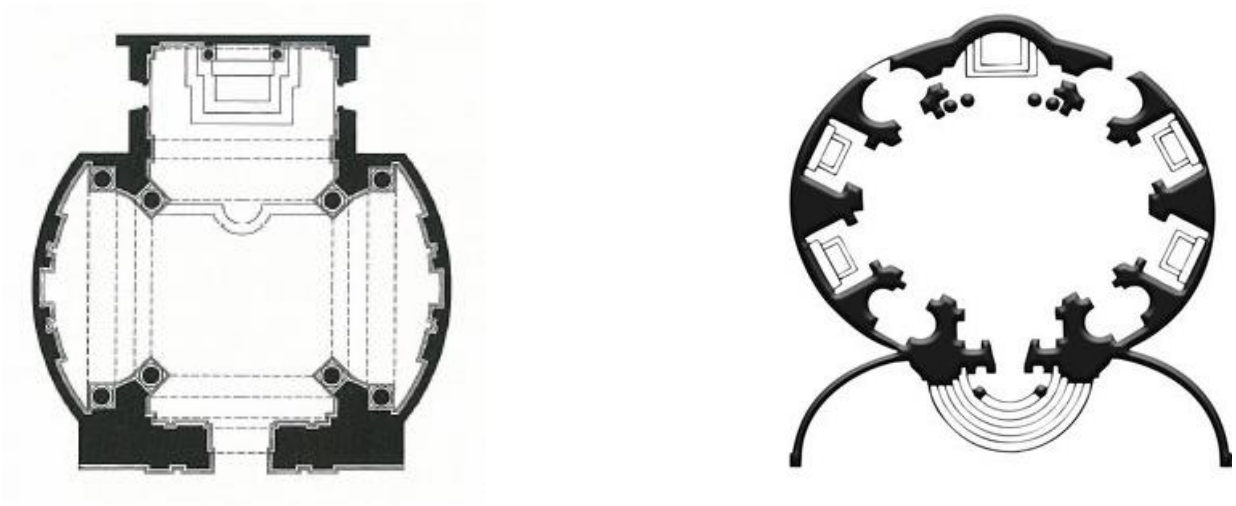

Figure 34 - Left: Michelangelo, Sforza Chapel floor plan compared to right: Bernini, Sant'Andrea al Quirinale floor plan

This leads me to believe that the Sforza Chapel was the beginning of Baroque art. It was Michelangelo's final work, and he began thinking in a different way, which is reflected in the design of the Sforza Chapel. It seems that Bernini, alongside Borromini, noticed this and continued working based on Michelangelo's design. Baroque characteristics are present in Michelangelo's Sforza Chapel. He deviated from perfect circles and rectangles and

created a floor plan that was not perfectly symmetrical. It appears that Michelangelo departed from this form to allow more light into the chapel, ensuring that upon entering, people would immediately see the central altar and then consider the side chapels. In Bernini's church, the floor plan is arranged so that upon entry, the visitor immediately sees the back of the church, where the altar is placed. It seems that Michelangelo also did this, and if you look at Michelangelo's Sforza Chapel floor plan, you can also see a sort of oval shape.

In the chapel of Michelangelo, the windows in the wall behind the central altar are clearly visible. The altar is, so to speak, illuminated. In the church of Bernini, there are also windows, but these windows are placed above the cornice throughout the church. However, there is a cutout above the location of the central altar so that daylight can shine on it. Additionally, in Michelangelo's chapel, hardly any colour has been used, and colour is only present at the central altar. Perhaps Michelangelo did this to draw attention to the altar rather than to the architecture. In Bernini's church, on the other hand, Bernini used a lot of colours. He did this because he thought the architecture, sculptures, colours, and paintings form a religious drama, telling a story. Bernini believed that architecture should serve as a backdrop for the sculptures and the story they tell (Hibbard, 1965). The exterior of Bernini's church, on the contrary, lacks colour. When visitors enter this church, I believe they do not expect the interior to be filled with different materials and colours. The exterior of the church is completely different from its interior.

In Figure 34, the floor plans of Michelangelo's chapel and Bernini's church are juxtaposed. In both buildings, a kind of oval shape is visible, with the entrance located at the short axis. Upon entering both buildings, visitors are immediately confronted with the central altar, before turning their attention to the side altars. In Bernini's church, there are multiple altars set into recesses in the wall. In Michelangelo's chapel, besides the central altar, there are only two side altars that are quickly noticeable to visitors. Bernini utilized completely freestanding columns at the altar in his church, while Michelangelo also created the impression of freestanding columns, although they are not entirely detached from the walls. I believe that Bernini's church truly showcases a dynamic interplay through its theatrical embellishments, whereas Michelangelo's chapel exudes a sense of tranquillity due to its sparing ornamentation. The space feels calm and serene, while Bernini's church narrates a theatrical story.

Conclusion

In this thesis, a comparative analysis has been conducted on three different subjects: the sculptures, the urban plans, and the architectural works of Michelangelo and Bernini.

The comparison between Michelangelo's David and Bernini's David reveals two different approaches to the same design. Michelangelo's David embodies the Renaissance ideals of perfection and serenity, while Bernini's David exudes drama and movement, typical of the Baroque period. It has also become clear that both artists drew inspiration from the sculptures of the ancient Greeks but approached them in their own way. Michelangelo remains faithful to the idealization of the human form and strives for timeless perfection, while Bernini embraces the emotional and dynamic aspects of human existence.

The comparison between Michelangelo's Piazza del Campidoglio and Bernini's St. Peter's Square reveals similarities and differences between these two works. Both squares aim for symmetry and proportion, with a central feature that captures the visitor's attention. Piazza del Campidoglio seems to have a more enclosed atmosphere due to the three surrounding buildings, while St. Peter's Square appears as a more open and inviting space with arms that figuratively embrace the visitor. What is striking is that Michelangelo, as a Renaissance artist, deviated from perfect circles, which were important in the Renaissance. This shows that Michelangelo found it more important to create a coherent plan rather than adhere strictly to the 'rules' of the Renaissance. Bernini utilized the trapezium shape of Piazza del Campidoglio in his design for St. Peter's Square to elongate and narrow the façade of St. Peter's Basilica.

In Michelangelo's Sforza Chapel, little use of colour is made, and there is an atmosphere of restrained serenity. In Bernini's Sant' Andrea al Quirinale, however, colour, ornamentation, and sculptures abound, telling a story to the visitor. It can be seen in the layout of the Sforza Chapel that Michelangelo, in the later years of his life, began to think differently. Once again, he deviated from perfect geometric forms and preferred to create architecturally sculptured spaces by maximizing the introduction of light.

Both artists drew inspiration from earlier works. Michelangelo and Bernini drew inspiration from the Apollo Belvedere and the Laocoön group. Bernini's work was inspired by his predecessor Michelangelo and further developed by his own beliefs. It could also be said that Michelangelo, after the excavation of the Laocoön group in 1506, began to think differently and realized that in antiquity, they did not only have static perfect statues but that there could be more dynamism. Before this excavation, Michelangelo had created the static David, but after the discovery of the Laocoön, it is particularly evident in Piazza del Campidoglio and the Sforza Chapel, where he took the first steps towards the Baroque in the design of the Sforza Chapel, and Bernini picked up on this and further developed it.

Six works by both artists have been examined and compared. I believe these works were well-chosen and effectively compared, as they exhibited both differences and similarities. The differences observed among the works seem logical since Michelangelo was a Renaissance artist and Bernini a Baroque artist, resulting in two distinct artistic styles. However, identifying similarities between the different works might have seemed challenging. Nevertheless, by selecting appropriate works from both artists, these similarities were highlighted. For further research, multiple works by Michelangelo and Bernini can be compared to arrive at a more comprehensive understanding. Specifically, sculptures and architectural works can be juxtaposed, as both artists have created numerous pieces in these mediums. Moreover, neither artist has extensively contributed to urban planning projects that could be compared. It is important to ensure that, when comparing these works, it is investigated whether the comparison is feasible, and that two completely different works are not compared with each other.

In the existing literature, numerous books cover Renaissance and Baroque sculptures, paintings, and architecture. There are also books dedicated to the life and works of both Michelangelo and Bernini. I have utilized these books for my thesis, as indicated in the bibliography. This thesis offers a comparison between various works of Michelangelo and Bernini, which have been thoroughly analysed. Additionally, I provide my

own perspective on these works by both artists and where possible, I critically evaluate the literature. I have expressed my opinions on the existing literature and have made assumptions about my thoughts and feelings regarding the different works. Given my background in architecture, I have made assumptions and provided my opinions on certain works. It is possible that a layperson or an art enthusiast might have arrived at different conclusions.

Annotated Bibliography

- Grömling, A., Völkel, L., & Timmerman, T. (2000). *Michelangelo Buonarroti: leven en werk*
  This book is used to gain more information about Michelangelo's life and works.

- Sanders, K. (2020). *Donatello, Michelangelo, and Bernini: Their Understanding of Antiquity and its Influence on the Representation of David. Department of Art and Art History, University of the Colorado.*
  This book is used for the analysis of the sculptures of Michelangelo and Bernini.

- Della Monica, M., Bernabei, P. A., Andreucci, E., Traficante, G., Paternostro, F., Peluso, F., Mauri, R., Provenzano, A., Giglio, S., Casazza, O., & Gulisano, M. (2019). *Michelangelo's David: triumph of perfection or perfect combination of variation and disproportions? A human perspective.*
  This book is used for the analysis of the sculpture of Michelangelo.

- McManus, I. C. (2005). *Symmetry and asymmetry in aesthetics and the arts.* European Review, 13(S2), 157–180. https://doi.org/10.1017/s1062798705000736
  This article is used for the analysis of the urban planning works of Michelangelo and Bernini

- Hibbard, H. (1965). *Bernini.*
  This book contains information about the life of Bernini and contains his works.

- Wittkower, R., Connors, J., & Montagu, J. (1999). *Art and Architecture in Italy, 1600–1750: Volume 2: The High Baroque, 1625–1675*. Yale University Press.
  This book contains information about art and architecture in Italy in the baroque period.

- Carlini, A., & Magrone, P. (2017). *Ellipses and ovals in the physical space of St. In Peter's Square in Rome.* 16th Conf. on Applied Mathematics (pp. 295-311)
  This article is used for the analysis of the St. Peter's Square.

- Lotz, W., & Howard, D. (1974). *Architecture in Italy, 1500-1600.*
  This book is used for the analysis of the urban planning works and architecture of Michelangelo.

- Frommel, C. L. (2007). *The Architecture of the Italian Renaissance.*
  This book is used for the analysis of the urban planning works and architecture of Michelangelo.

- Hopkins, A. (2002). *Italian Architecture from Michelangelo to Borromini.*
  This book is used for the analysis of the urban planning works and architecture of Michelangelo.

- Fürst, U. (1998). *The architecture of Rome: An Architectural History in 400 Individual Presentations. Edition Axel Menges.*
  This book is used for the analysis of the urban planning works and architecture of Michelangelo and Bernini.

- de Heij, G. E. (2011). *Michelangelo en de Laocoön.*
  This article is used for the analysis of the sculptures.