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Inherited Geometry: A Socio-Professional Pattern in the Low Countries, 1480–1560

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At the beginning of the 16th century the Habsburg Low Countries witnessed the emergence of a highly skilled class of painters who also often actively engaged in architectural design practice. This phenomenon has often been explained as being the result of an influx of Italian and humanist thinking about the artist such via the writings of figures like Alberti and Vitruvius. In this article, I propose an alternative account, using selected case studies to argue that this development was an internal process. Essential to changing design practices was the transfer of geometrical design knowledge between guilds, a transfer that transgressed traditional boundaries. Finally, I explore the effect of this knowledge dissemination on the evolving status of the visual artist.

Keywords: geometry; architectural drawing; painters; workshop; humanism; painter-architect

Introduction

In 1539, after a long and successful career as an Antwerp panel painter, Pieter Coecke van Aelst (1502–1550) famously introduced and translated the architectural treatises of Vitruvius and Sebastiano Serlio to a growing northern readership of humanists (Rolf 1978; De Jonge 1998; De Jonge 2007: 26). Through his knowledge of these publications the learned Antwerp painter could present himself as a connoisseur of classical architecture and building practices. Coecke is a prime example of the phenomenon of the 'painter-architect' in the Low Countries, and this double identity was memorialized in Domenicus Lampsonius' *Pictorum aliquot celebrium germaniae inferioris effigies antverpiae* (1572), one of the first writings on Netherlandish artists in the same vein as Vasari's *Lives of the Artists* (Melion 1991: 130–131; Filipczak 1987; Lampsonius 2022). While the engraved portrait of Coecke by Johannes Wierix represents him as a painter by depicting him holding a palette (**Figure 1**), the accompanying text stresses his role as a translator of Serlio into Dutch and French.

Figure 1: Joannes Wierix, engraved portrait of Pieter Coecke Van Aelst published in Domenicus Lampsonius, *Pictorum aliquot celebrium germaniae inferioris effigies antverpiae* (1572). Photo: Rijksmuseum.

In the poem dedicated to Coecke's near-contemporary Quinten Metsys (1466–1530), Lampsonius elaborates on a popular legend according to which the Antwerp artist started his career as a blacksmith but made a professional shift to painting when he started courting a young lady who 'liked the heavy thunderclaps of the hammers far less than the quiet paintbrush' (Lampsonius 1572; Silver 1984: 1). When Hendrick Hondius (1573–1650) republished many of these plates as part of an extended re-edition of Lampsonius' biographies, the horizontal parallel hatching in the background of a number of Wierix' portrait engravings was replaced by Simon Frisius (1570–1629) with more elaborate workshop settings referring to the biographical text. In the case of Metsys, a blacksmith's workshop was added and a younger version of Metsys was depicted hammering the anvil in the background on the left (**Figure 2**). A contrast emerges in Lampsonius' biographies of these artists: he represents Coecke's interest in architectural theory as adding value to his career as a painter, while he implies Metsys' professional beginnings as a smith was a mere stepping stone or even an obstacle to be overcome in his advancing to the supposedly nobler art of painting.

Figure 2: Simon Frisius, engraved portrait of Quinten Metsys published in Hendrick Hondius, *Pictorum aliquot celebrium, praecipue germaniae inferioris* (1610). Amsterdam, Rijksmuseum, inv. RP-P-1907-375. Photo: Rijksmuseum.

Metsys' professional background was not uncommon amongst craftsmen who practiced as painters and/or architects during the first half of the 16th century, nor was it considered demeaning, as later historiography suggests. A comparative analysis of the generation of Netherlandish painters who received architectural or micro-architectural commissions during this period reveals a recurrent socio-professional pattern: many painters who engaged in architectural practice came from established families with members who had been practicing architectural design for generations in their capacity as master masons, land surveyors, goldsmiths, and ornamental sculptors. A transdisciplinary approach to these crafts uncovers the dissemination of design knowledge among different professional spheres in the Netherlandish urban environment.

Architectural Design as Contested Practice

In the context of the late 15th century and early 16th century, the term *architect* in the Low Countries can be highly misleading. By the second half of the 15th century, a noticeable change in building practice had occurred, as the presence of a designing master mason, or 'overseer', was no longer constantly required on the building site. Instead, a handful of architectural designers such as Evert Spoorwater, Domien De Waghemakere, and the members of the industrious Keldermans dynasty were increasingly responsible for a vast share of large building projects across the Low Countries, where they worked as mobile contractors, developing innovative designs that revealed a more theoretical and intellectual engagement with architectural practice than earlier projects (Meischke 1987; Hurx 2014; Hurx 2018: 207–239). The production of architectural drawings was not restricted to the emerging design practice of the master mason; any craftsman equipped with proficient drawing skills and geometrical knowledge was able to create architectural designs, and they did not necessarily need to belong to the masons' guild. In an oft-cited 1542 Utrecht court case between a master mason and a sculptor, the master mason argued that he alone should receive payment for delivering architectural designs (Muller 1881; Miedema 1980; Hurx 2018: 42–47), but his opponent brought forward six experts from Antwerp who were all willing to testify that it was very common for craftsmen other than stonecutters or masons to deliver architectural designs, regardless of whether they assumed the form of drawings, stonecutting molds, or three-dimensional models. Contemporary contracts of employment and apprenticeship as well as existing drawings by goldsmiths, carpenters, and painters alike likewise attest to the fact that craftsmen worked on architectural designs (Kik 2021: 35–38). These craftsmen all designed architecture on some scale, often referring to it in documents with the middle Dutch term *metselrij* (which literally means 'masonry'). This term designated both buildings and a broad spectrum of architectural

objects, such as monstrances, reliquaries, the sculpted framings and tracery frames of carved altarpieces, pulpits bases, sacrament towers, and the geometric façade design of rood screens. What united these craftsmen was their commonly shared knowledge of applied Euclidian geometry, which enabled them to supply measurable and accurate drawings that could be used in the workshop or at the building site. By the middle of the 15th century the design of complex geometric figures had become a characteristic feature of architectural design and was regarded as a token of the inventiveness of the individual designer (Kavaler 2008: 121; Kavaler 2012). While these craftsmen did not employ the complex theoretical and Neoplatonic geometry practiced and embraced in humanist circles, increasingly complex Euclidian geometrical design rules were being communicated as part of a long-standing oral tradition within medieval workshop practice. Their application was mostly limited to the *ad quadratum* method: a set of rules-of-thumb for how to derive an elevation (and its mutual proportions) from a ground plan composed out of reconfigured circles, triangles, and squares (Shelby 1970; Shelby 1977; Bork 2011; Andrews 2022). The titles or introductions of the earliest written treatises on geometry and architecture, both in Germany and the Low Countries, often give insight into the varied ways craftsmen applied geometry. In the introduction to his 1489 *Fialenbüchlein* (Booklet on pinnacles) that outlines gothic design principles, Hans Schmuttermeyer, a Nuremberg goldsmith, stresses that his short treatise was intended 'for the instruction of our fellowmen and all masters and journeymen who use this high and liberal art of geometry' (Shelby 1977: 58). Schmuttermeyer's alignment of 'art' with geometry as part of the quadrivium of the liberal arts here was especially important with respect to the dissemination of geometrical design.

When Albrecht Dürer published his *Underweysung der Messung* (Treatise on measurement) in 1525, he was even more unequivocal about the connection between art and geometry, noting in his dedicatory epistle that his book was intended 'for the benefit of all who seek after art, and for the use not only of painters but also goldsmiths, sculptors, stonemasons, cabinet makers, and all who have need of geometry' (Ashcroft 2017: 777). When Dürer mentions on the title page of the same treatise that his book is intended for 'allen kunstlieb habenden' ('all who love art'), he is addressing those who practice the liberal arts (Panofsky 1948: 242–246). Dürer, who was very familiar with Schmuttermeyer's booklet, understood painting, sculpture, metalwork, stonecutting, carpentry, and architecture as practices sharing the same theoretical foundation based on geometry (Eser 2012: 25). In a 1523 letter to the anonymous ghostwriter with whom he wrote his *Four Books on Human Proportion*, Dürer stresses that 'this proportion, if it is understood, may be used by painters, sculptors in wood and stone, goldsmiths, metal-casters, potters who decorate with clay, or all those who set out to make pictures' (Ashcroft 2017: 709).

Much in the same tradition, Coecke addressed a similar reading audience when he dedicated his translation of Serlio's *Generale regelen* (1539) to 'the lovers of Architecture' (1539a: fol. 55). In his more affordable Vitruvian booklet, *Die inventie der colommen* (1539), Coecke specifies that these fellow craftsmen are his main audience, noting the pamphlet is meant 'for painters, sculptors, stonecutters, etc. and all who take pleasure from the antique building manner' (1539b: fol. 5). Therefore, even though Coecke's treatises on antique architecture promoted an innovative, Vitruvian approach to the building practice that emphasized his scholarship, they also partake in a long tradition of addressing writings on architectural design to a wide range of craftsmen. Coecke and Dürer, however, in contrast to earlier writers, included painters in their list of craftsmen. This suggests the emergence of a generation of geometrically oriented painters who consciously sought to elevate the status of painting through their geometrical knowledge.

Architect-Painters in the Low Countries: Metsys, Blondeel, and Rombouts

Analysis of the professional background of groups of painters who engaged in architectural design and those who demonstrated a more pronounced interest in *all'antica* architectural forms during the first half of the 16th century reveals a pattern. Lampsonius' account of how Metsys the blacksmith became a painter exceeds the Vasarian commonplace of a self-taught master finding his vocation, guided by his own talent. Archival documents before 1491, the year Metsys entered the Antwerp guild of St Luke, tell us nothing about the artist's early career. Yet we can assume that he started out working in the blacksmithing workshop owned by his father Joos Metsys (d. 1482) in Leuven, who enjoyed a high position in civil society in his capacity as guardian of the chapel patronized by the Leuven goldsmiths' guild, dedicated to St Eloy and located in St Peter's, the city's main church. His eldest brother, who was also named Joos (ca. 1464–1529), followed in the footsteps of his father by joining the blacksmithing profession whilst cultivating his professional status as one of the most prominent architects in Leuven, assuming responsibility for the building site of St Peter's in 1507 (Bral 2004; Van Buyten 2004: 44). His transition from blacksmith to architect indicates the fluidity of borders between sculptors, blacksmiths, and master masons in the early modern building site and urban guild structures. As part of this ongoing building project, in 1526 Joos produced an elaborate elevation drawing in a fashionable gothic style for the ambitious west façade that featured three large spires (**Figure 3**). While the professional viewer could glean design information from the drawing, it was chiefly intended for the patrons (church wardens and the city) as well as churchgoers (Böker 2011; Böker 2013; Bork 2011: 400–410). At the same time, Joos Metsys, together with the sculptor

Jan (IV) Beyaert, who was also his son-in-law, agreed to deliver a stone model of the west towers' project. Although archival sources have indicated that the production of stone, paper, or wooden models was common in architectural design practice, the model made by Beyaert and Metsys is the only surviving three-dimensional model for a building project in the Netherlandish architectural design process (Hurx and Ottenheym 2015). The model, which is over eight meters high and made out of delicate and costly white Avesnes limestone, took more work and money than most architectural models (**Figure 4**). The presentation drawing and the stone model would have been displayed in a public space, addressing not only the professional craftsman or interested layman but also members of a growing social group whose knowledge of complex geometrical forms contributed to their intellectual prestige in learned conversations and writings (Kavaler 2000; Kavaler 2012: 50–68).

Figure 3: Joos II Metsys, Elevation of the west tower for St Peter's, Leuven, ca. 1505–1526, pen and brown ink with brown wash on parchment, 176 × 82 cm. Leuven, Museum M, inv. LP/927. Photo: Dominique Provost/Art in Flanders.

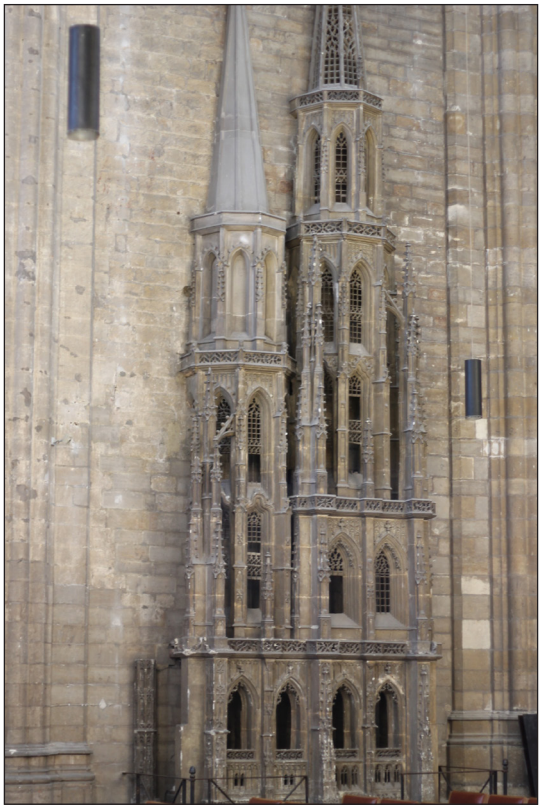

Figure 4: Joos II Metsys and Jan Beyaert, stone model of the west tower for St Peter's, Leuven, ca. 1524–1530, Avesne limestone, 827 × 246,5 × 80 cm. Leuven, St Peter's, inv. B/VI/247. Photo: author.

Although no evidence exists documenting Quinten Metsys' training before his enrolment as a free master in the Antwerp painter's guild in 1491, his brother Joos' design project in Leuven and their father's activities suggest that the young artist first learned how to draw and transfer his ideas to paper from his family and that they first exposed him to architectural forms and their creative deployment. His earlier works in particular clearly suggest that he had training as an architectural draughtsman. In his 1505 *Virgin and Child Enthroned* (**Figure 5**), the divine titular characters are seated on a gilded throne whose gothic tracery echoes that in the window on the parchment drawing and the limestone model for the St Peter's project to which his brother was assigned at around the same time. In particular, the rigid linearity and absence of depth in the gold tracery (especially in comparison with other painted goldwork tracery, for instance, that in Jan Gossart's *Deesis* [1525–1530]), strongly reflect the influence of an orthogonal approach to drawing, as seen in many gothic elevation drawings, most notably his brother's design for the Leuven church. The *Virgin and Child Enthroned* is a perfect example of the cross-fertilization of these drawing traditions that would

lead painters to develop new skill sets. The painter's architectural background in Leuven can also be seen in his second *Virgin and Child Enthroned* that dates to the final years of his career, around 1525 (**Figure 6**). The double gothic tracery in the upper arch demonstrates an excellent knowledge of the novel gothic language employed by leading building masters such as the Keldermans (Mosselveld 1987; Kavaler 2012; Hurx 2018), while the fountain in the landscape to the right refers to the upper section of the sacrament tower designed for Leuven's St Peter's by Matheus De Layens in 1450.[1]

Figure 5: Quinten Metsys, *The Virgin and Child Enthroned*, c. 1506–1509, oil on panel, 62.3 × 43.5 cm. London, National Gallery, inv. NG6282. Photo: National Gallery.

Figure 6: Quinten Metsys, *The Virgin and Child Enthroned*, c. 1525, oil on panel, 138.2 × 91.5 cm. Berlin, Gemäldegalerie der Staatlichen Museen zu Berlin, inv. NG6282. Photo: Jörg P. Anders/Gemäldegalerie der Staatlichen Museen zu Berlin, Preußischer Kulturbesitz.

Gilt tracery is also a dominant element in the oeuvre of the Bruges painter Lanceloot Blondeel (1498–1561). Like Metsys, Blondeel took a turn in his career path when he joined the Bruges Guild of St Luke, and as in the case of Metsys, there is no record of his having been a pupil of another painter, so it can be assumed that he was likewise trained by his father (a master mason) and taught to draw architectural designs for both buildings and sculptures. In his *St Luke Painting the Virgin* and *The Enthroned Virgin with St Eloy and St Luke* (**Figure 7**), both from 1545, the religious figures are almost

overshadowed by an elaborate *all'antica* framework with a remarkably innovative ornament design and ambitious, structurally complex architectural innovations that reference the fashionable frames and grotesque motifs found in French, German, and Italian ornament prints, as well as theoretical treatises such as Serlio. Blondeel was one of the first painters to introduce the Fontainebleau strapwork ornament to the Low Countries with these panels, doing so at the same time that prints with similar ornamental motifs were published in Antwerp by Cornelis Bos (Schelé 1965: 24; Van der Coelen 1995: 123; Speelberg 2014). Like Metsys, Blondeel used his knowledge of architecture and ornament to distinguish himself from other painters as an artist whose work was informed by an interest in architectural novelty and geometrical design, which he developed during his training as a mason or stone sculptor (the distinction between these two professions being practically nonexistent in early modern architectural practice).

Figure 7: Lanceloot Blondeel, *The Enthroned Virgin with St Eloy and St Luke*, 1545, oil on canvas, 136 × 95 cm. Bruges, Sint-Salvatorskathedraal. Photo: Hugo Maertens/Art in Flanders.

Blondeel continued to set himself apart by drawing on his architectural knowledge throughout his career: one of his earliest documented commissions was to design the ephemeral architecture with *tableaux vivants* to celebrate the joyous entry in the city of the newly coronated Charles V in 1520 (Weale 1908; Schouteet 1958: 18; Jansen 1998; Martens 2017: 129), and his most renowned contribution as a sculptural and architectural designer was his work for the chimney piece in the newly constructed alderman's chamber in the Brugse Vrije (**Figure 8**).[2] In January 1525 the commission was granted to the Bruges carpenter Willem Aerts, who was to provide designs and instructions and then execute the mantelpiece (Devliegher 1987: 45–50). In November 1528 Blondeel presented new drawings for the mantelpiece to the magistrates, who subsequently decided to use his designs instead of the ones previously presented by Aerts, thus shifting the design commission from a carpenter to a painter. Blondeel had already demonstrated a solid understanding of novel ornamental motifs in the antique style in his painted oeuvre, which most likely had been displayed for the entire city and imperial court during the 1520 visit of Charles V. In the *Triptych with Saints Cosmas and Damian* of 1523 the narrative scenes are structured and dominated by an elaborate gold framework in a well-balanced combination of modern gothic elements (akin to those used by the major master masons of the Keldermans dynasty) and equally fashionable antique ornament such as medallions, putti, garlands, candelabra pilasters, and bucrania. Blondeel's mastery of both ornamental styles, which was a trademark of many contemporary artists such as Gossart and Bernard Van Orley, was most likely the main reason the magistrates opted for him over Aerts (Kavaler 2000; Kavaler 2012). Throughout his career as a painter, Blondeel would continue to deliver designs for sculpture, particularly for works realized by his brother-in-law, the Bruges sculptor Michiel Scherrier (active 1534–1552).

Figure 8: Alderman's chamber in the Brugse Vrije, with chimney piece by Lanceloot Blondeel. Photo: author.

Another example of a painter following a similar career path as Blondeel and Metsys is the recently rediscovered Leuven painter Jan Rombouts (ca. 1480–1535). The fact that he was referred to in documents as *scaille* (slater) suggests that he may not always have been a painter, but probably spent a few years of his life working in his father's and grandfather's roofing profession (Bruijnen 2011: 25). His painted work is also dominated by an abundance of monumental architectural forms and ornament, most often inspired by antique architecture (Bruijnen 2011). A prime example is the outer wing of an altarpiece in Leuven (Museum M) depicting St Margaret and the dragon, dated between 1522 and 1525 (**Figure 9**). Although textual accounts of St Margaret's life place the scene in a dungeon, where the saint was imprisoned, Rombouts' painting shows her in a richly decorated palatial interior dominated by massive columns. Working before any standardization of the orders in the Netherlands, painters like Rombouts and many of his contemporaries enjoyed great creative liberties with antique architectural forms, and their experimentation often resulted in extravagant combinations. Hence, the marble and porphyry shafts of the columns to the left stand on bases that look like highly decorative, upside-down voluted capitals. While some of these individual elements may be derived from printed or theoretical sources on architectural orders and ornamentation, they were deployed freely by a variety of contemporary artists, including Van Orley, Blondeel, Joos van Cleve, the so-called Antwerp Mannerists, and even Gossart, whose approach to antique architecture can be considered the most antiquarian of his time (Heringuez 2008; Kavaler 2010; Kik 2014; Bass 2016).

Figure 9: Jan Rombouts, *St Margaret and the Dragon*, 1522–1525, oil on panel, 228 × 118 cm. Leuven, Museum M. inv. S/10/R. Photo: Dominique Provost/Art in Flanders.

The variety of occupations that family members engaged in created numerous job opportunities. Young painters could often benefit from the high-profile networks established by their family members working as goldsmiths or master masons, professions that were very well regarded in the early modern urban society of the Low Countries. For example, Metsys' first documented commission, the St Anne altarpiece of 1509, was created for the same church in Leuven whose building site his brother was overseeing. The fact that some members of goldsmithing or master masons' families chose a career in painting did not necessarily undermine the family's often-cherished traditions or established expertise, since the eldest son was still most likely to follow in his father's footsteps. In addition, family ties with other influential families in the trade were maintained through marriage. This trend provided a tremendous diversification: family members worked across a broad array of crafts and belonged to different guilds, which enlarged their family's network and its impact on social and corporate urban structures.

It is no coincidence that this socio-professional diversification was accompanied by a sudden increase in the demand for panel paintings and the creation of an international market for them. The establishment of the Dominican *pand* (1445–1553) and Our Lady's *pand* in Antwerp, for example, meant painters were no longer dependent on specific commissions from the clergy, nobility, or urban upper classes but were at liberty to sell and export their works to a broad international clientele (Vermeylen 2003). The expansion of the Antwerp market that made paintings available as a middle-class luxury product is a well-studied phenomenon, and research has confirmed Ludovico Guicciardini's claim that there were at least 300 active painters' workshops in Antwerp by the 1560s (1567: 168). Quantitative analyses of enrolment in the Antwerp guild of St Luke indicate that the number of painters who were free masters was significantly higher than that of other professional groups (Martens and Peeters 2007: 214–215). By 1564, a total of 149 painters were registered as free masters, in comparison to 10 silversmiths and 16 sculptors. The market for paintings was more active than that for other objects and rife with opportunities (at least during the first quarter of the century). There were also more painters (some of whom came from goldsmithing families) than other craftsmen registered in the Bruges guild of St Luke between 1466 and 1500. The first decades of the 16th century saw an influx of new painter apprentices coming from a workshop environment whose skill set was dramatically expanded by the geometrical and arithmetical approach to design and drawing practice and whose professional status improved in turn.

Signs of Knowledge

Besides the representation of architecture, another way for painters to display their geometrical and architectural knowledge was through the use of a signature. During the 15th-century Netherlandish painters rarely systematically signed their work (Burg 2007: 382–416), but beginning in the early 16th century signing became a more common practice both in urban and courtly centers. These early signatures were often house marks like those traditionally used by masons, sculptors, gold- and silversmiths, cabinetmakers, and woodcarvers. Most commonly they were restricted to a combination of horizontal, vertical, and diagonal lines, although they could also take the shape of individual letters, monograms, or masons' tools such as a hammer, trowel, a measuring rod, or a measuring square. The geometrical nature of the signature (both as sign or tool) highlighted the technical background of the designer. During the 15th century, house marks were not just used to identify an artisan's workshop but also appeared on coats of arms, tombstones, and documents. While house marks were not the exclusive province of architects, sculptors, or goldsmiths, it was specifically within this professional environment that they signified the creator's technical expertise in the liberal art of geometry and the social standing associated with it. As Kavaler argues, even idiosyncratic geometrical forms and patterns could amount to self-aware expressions of the designer's artistic identity (2012: 91–94).

A new generation of painters (and, by extension, printmakers) inherited a fundamentally geometrical understanding of design principles as well as new signing methods that highlighted the social position of the artist. Quinten Metsys, for example, not only signed his works with Latinized capitals 'QUINTE METSYS SCREEF DIT' ('Quinten Metsys wrote this') a common practice among artists (e.g., Gossart and Van Orley) working for courtly and humanist patrons, but also with an hourglass-shaped house mark (often neglected in the literature) and the work's year, 1509 (**Figure 10**).[3] The location of his signature also seems to hint at his advanced architectural design knowledge, as it is prominently placed on an entablature above a window overlooking what seems to be an anticipated version of the north tower of Antwerp's church of Our Lady, which would not be finished until 1521, twelve years after the painting was commissioned (Van Langendonck 1993: 117). While Metsys did not contribute to the plans for the spire (this job was entrusted to the architect Domien de Wagemakere), we can assume that he was well aware of the latest developments in architectural practice given that his oldest brother was working at a rival ecclesiastic building project.[4]

Figure 10: Quinten Metsys, St Anne altarpiece (outer left wing), 1509. Brussels, Royal Museum of Fine Arts, inv. 2784. Photo: Johan Geleyns/KMSKB.

In the famous *The Money Changer and His Wife*, an inscription reading 'Quinten Matsys Schilder 1514' appears on a roll of parchment on one of the shelves in the background along with a small hammer beneath it, signifying to the beholder that Metsys is a painter and simultaneously proud to have been trained as a smith (**Figure 11**). As the son of a smith and the brother of a master mason, he signed his paintings with a hammer (the main tool of a blacksmith) to convey his professionally inherited experience in geometry and its applications.

Figure 11: Quinten Metsys, *The Money Changer and His Wife* (detail), 1514, oil on panel, 70.5 × 67 cm. Paris, Musée du Louvre, inv. 1444. Photo: Royal Institute for Cultural Heritage.

Metsys' method of signing with a hammer is comparable to Blondeel's of using a trowel to emphasize his background and training as a mason in Bruges. Since architectural and ornamental frameworks dominate the painted oeuvre of Blondeel and since we know he was involved in several sculptural, cartographic, and architectural commissions (Jansen 1998: 173), there can be little doubt that the trowel in combination with his monogram functions as a testimony of the artist's geometrical knowledge. The signature of the early engraver who is often referred to as Master IAM of Zwolle likewise serves to indicate his technical acumen. Working as a painter of sculpture and probably as a local goldsmith in the city of Zwolle, the artist consistently combined his initials in his engravings with the representation a burnishing tool or gold drill employed by goldsmiths (De Vries 1985; Pfeiffer-Helke 2013: 86).

Geometry, Science and Art

Despite the image later projected by humanist scholars such as Lampsonius (which was reinforced by 19th- and 20th-century historiography), the professions of mason, goldsmith, or blacksmith were highly regarded in Netherlandish urban society, as also suggested by these artists' income, courtly titles, and their (self-)representation in sculpted and painted portraits. Their social standing was bolstered by their network of prestigious patrons, and their expertise in the field of geometry, one of the four arts of the quadrivium and considered a liberal art, further enhanced their professional and social status. Over the course of the 15th and 16th centuries, European intellectuals and humanist thinkers came to value the mathematical quadrivium alongside the already established, language-based, and more scholastic trivium in their attempt to understand the perceived world (Reiss 1997). The embrace of mathematical reasoning coincided with the emergence of a novel aesthetic rationalism, connected closely with the study of proportions in the visual arts and music (Baxandall 1972). The proportions of the human body, architecture, and sculpture were reduced to and comprehended through general arithmetical or geometrical principles, as explained in the writings of Vitruvius, Alberti, Pomponius Gauricus, Piero della Francesca, and Luca Pacioli.

In the Low Countries, the use of terms such as *artiest* and *constelijk* (artistic) along with *scientie* and *ingenium*, which often refer to a craftsman's mastery of the liberal art of geometry, indicates the growing interest in mathematics and its applications to craftsmanship. For example, Coecke uses the term *scientie* to specify that his *Inventie der Colommen* (1539) deals with 'the science of Architecture', an expression he quotes from Cesariano's 1521 edition of Vitruvius' *De architectura*. The identification of craftsmen as *artiest* is an interesting phenomenon, since the word was barely used in the Low Countries before the 16th century. The term crops up in reference to the sculptor Jean

Moné, who appears as ‘artiste’ or ‘Mr Jannen Artiste’ in documents and contracts dating from 1522 to 1547 (De Jonge 2011: 112), and the courtly sculptor and architect Jacques Du Broeucq, described as ‘Jacques lartiste’ and ‘maistre artiste de l’empereur’ (‘artist to the emperor’). Coecke too was designated ‘artiste de l’empereur’ because of his works for the Habsburg court and his knowledge of classical architectural language (De Jonge 2017: 135). All three of these ‘artists’ had an urban background, worked for the most prominent members of the Habsburg court, and were actively engaged with architectural theory and practice informed by the rules of geometry. A literary epitaph for the recently deceased Lanceloot Blondeel composed by the Bruges humanist poet and rhetorician Eduard de Dene (1505–1578) in 1578 as part of a collection of handwritten effigies on prominent Bruges citizens likewise stresses the value of a background in geometry as foundation for his status as an artist (De Dene 1976–1977: 22; Devliegher 1987: 87): ‘Here lays buried the body of Lanceloot Blondeel/First he was at work as a mason and a great artist with the mason’s trowel/after which he became a painter/following Apelles’s brush in painting/thus completing himself in Architecture’ (De Dene 1578: fol. 180r).

Although De Dene deploys familiar Plinian tropes by referring to Apelles, he makes it clear that Blondeel was a great artist thanks to his handling of the mason’s trowel and not in spite of it. Unlike Lampsonius’ almost contemporary poem about Metsys by Lampsonius that represents Metsys as having overcome his blacksmithing roots by becoming a great painter, while De Dene suggests Blondeel was already a great artist when he was a mason. For De Dene, the term ‘art’ was a clear reference to the liberal arts (and geometry in particular) so that Blondeel’s family background in architecture could only be regarded as an advantage. Painting, De Dene implies, was not the highest goal of artistic endeavour but provided Blondeel with a way to refine his accomplishments and complete the arc of his career with Architectura, seen within the Vitruvian meaning of the term (i.e. an intellectual designer skilled in various arts).

Adding to the prominence of geometry and geometrical design in general was the medieval tradition of aligning the perfection of geometrical figures to theological concepts of the divine (Reiss 1997; Kavaler 2017: 48–52). From Cassiodorus (c. 485–580) to Boethius (c. 477–524), geometry was seen as the driving force of creation and as an instrument for comprehending God’s design. Boethius argues in his *De institutione arithmetica* (c. 500) that ‘God founded the first principle [of the quadrivium] as the exemplar of his own thought and established all things in accord with it’. Illuminations of God holding a compass as he creates the cosmos are numerous and illustrate the concept of divine geometry. The fact that architectural designers applied the same methodological and conceptual tools which were used by God during creation gave

architects an almost mystical aura. For the visual arts in the Low Countries, it was essentially the writings of Nicholas de Cusa (1401–1465) that influenced the debate and image of geometry as divine power (Koerner 1993: 127–138; Bocken 2012). In his *De docta ignorantiai*, he represents the circle and sphere as divine forms of the cosmos, explaining that 'with Geometry' God gave the cosmos 'a balanced design upon which depends its stability and its power of controlled movement'.

As a result of the growing importance of the quadrivium within a humanist urban middle class, the ability to apply geometrical and arithmetical principles with a compass and rule increasingly distinguished the architectural designer from other manual craftsmen, including painters. At a time when painters were seeking to elevate their social position, the promotion of geometrical acumen through a display of architectural ingenuity or the tactical placement of a house mark helped distinguish them from other painters whose training or background did not include geometrical design. This was not just an important marker of distinction in terms of social status; it also enabled painters to work in different fields: many geometrically trained painters, including Blondeel and his son-in-law Pieter Pourbus, also worked as cartographers, testifying to the breadth and detail of their mathematical training as well as to their ability to practically apply their knowledge of triangulation and trigonometry.

Conclusion

Although this article highlights Metsys, Blondeel, and Rombouts, the list of 16th-century Netherlandish painters whose families included members engaged in a profession for which they received geometrical training is much longer.[5] As a result of their acquired capital in the building trade, the precious material they worked with, and their expertise as geometrical designers, architects and goldsmiths had already boosted their status by the 15th century. For the new generation of painters, active between 1500 and 1540, having a technical background rooted in geometrical design principles, trigonometry, and triangulation made it possible for them to develop geometrical linear perspective and to take on commissions in micro-architectural projects, giving them a profound understanding of structural relationships in designing painted architecture. The geometrical knowledge of goldsmiths and sculptors/masons who became painters during the first half of the 16th century had a considerable impact on their professional and social position, giving them access to the social circles to which the professional group of architectural designers proudly belonged.

The socio-professional pattern studied here had occurred about a century earlier in Florentine artistic circles. A full comparative analysis of these two different socio-economic and cultural regions calls for an in-depth inquiry, but the fact that the

social network of those artists known for (re)introducing linear perspective and a basic mathematical understanding (e.g., Brunelleschi, Ghiberti, Donatello) shared a background as sculptors, architects, and goldsmiths whose work was informed in fundamental ways by Euclidean principles is remarkable (Kemp 1990). Quattrocento sculptors and painters such as Masolino, Paolo Uccello, Andrea del Verrocchio, Sandro Botticelli, Francesco Francia, and Domenico Ghirlandaio were initially trained as goldsmiths but found a profitable alternative business model in new developing markets, often exploiting their knowledge of fashionable ornamentation and geometrical know-how (Bloch & Zolli 2020: 5–15). The prominence of geometrical and mathematical understanding for Italian artists would reach a peak during the high Renaissance.

The fact that this socio-professional process occurred in northern Europe at the beginning of the 16th century is less the result of Italian influence than of certain conditions being met that made it possible, such as market changes, knowledge transfer, and a humanist interest in the quadrivium. Very similar circumstances obtained in early 16th-century Bavaria, where not only Dürer but also artists such as Augustin Hirschvogel and Christoph Jamnitzer embraced geometry and art, creating a bridge between the scientific concept of *ars* and art as an aesthetic category (Viljoen 2016; Marr 2018; Andrews 2022). Misleading terms such as painter-architect or sculptor-architect falsely suggest an underlying dichotomy between these professional groups. While guilds had a social and normative function, their regulations did not prevent their members from designing for specific crafts, allowing for the transfer of design knowledge beyond guild boundaries. When we examine early modern design practice by only considering categories limited to professional groups, we fail to see the larger context and particularly the relations between various arts.

Notes

[1] This sacrament tower was one of the most influential gothic spires in the region and had lost little of its popularity 50 years later. The master mason Alart Du Hameel published an engraving featuring a similar structure around 1495. Between 1536 and 1538 the church wardens of St Gummarus in Lier and of St James in Leuven both stipulated that De Layens' sacrament tower should be treated as the prototype (Timmerman 2009: 324–327; Kavaler 2012: 10–11).

[2] Although visual records on these decorations have not survived, the ephemeral decorations made during the joyous entry of Prince Charles on April 18, 1515 gives an indication of the classical nature of the decorations made by Blondeel five years later. A manuscript with depictions and descriptions of the decorations was produced by Remy du Puys, archivist and historiographer to the court of Maximilian I. All ephemeral decorations were executed in the newest *all'antica* manner. See Vienna, Osterreichische Nationalbibliothek, codex 2591; for a facsimile, see Du Puys 1973.

[3] The St Anne altarpiece is one of few signed and dated works by Metsys. The fact that his signature is located on the outside wings is significant: it would have been visible when the triptych was closed, which was most of the time, as altarpieces were only opened on festive days or other special occasions.

[4] Other architects working on comparable projects were usually asked to give their opinion on their colleagues' architectural designs. They might make a visit (*visiteren*) to the building site or offer an assessment of the drawings. Joos II Metsys was part of a close-knit network of architectural designers in the Low Countries whose expertise was frequently requested.

[5] For example, Willem Key (1519–1568) was part of a renowned family of goldsmiths from Breda. Lambert Suavius (1510–1567), famous painter and engraver, was the son of the Liège goldsmith Henri Zutman (1460–1512), where he first received his training. Jan Gossart may have sprung from a family of reputable sculptors. Frans and Cornelis Floris came from a long family tradition of masons and stonecutters in Brussels and Antwerp, which can be traced back to the late 14th century. The son of the celebrated sculptor and architect Jan d'Heere was the painter and art theorist Lucas de Heere. Finally, the Antwerp painters Gillis I and Gillis II Coignet were members of one of the most renowned families of goldsmiths, jewelers, and instrument makers in the Low Countries (Kik 2021: 82, with further references).

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