

# New Findings Concerning the Underdrawing of Stefan Lochner's 'Altarpiece of the City Patron Saints' in Cologne Cathedral

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(English translation of the article: Schaefer, v. Saint-George, *Neues zur Unterzeichnung des Altars der Stadtpatrone im Kölner Dom*, in: *Kölner Domblatt* 79/ 2014, S. 121-181)

It was realized many years ago that it would be useful to apply modern techniques of painting investigation to make visible the composition planning hidden as the underdrawing beneath the paint layer of the 'Altarpiece of the City Patron Saints'. For after all, this large-format retable, as the central work of the famous Cologne painter Stefan Lochner, is the one used to attribute, on stylistic grounds, otherwise anonymous works to him (fig. 1).<sup>1</sup> As underdrawings too have been increasingly used in recent years by those comparing painters' styles, the desire for a comprehensive imaging of the graphic compositional planning of the 'Altarpiece of the City Patron Saints' became ever more pressing.

Two circumstances have recently provided optimum conditions for realizing this desire. Firstly, there was the research project 'Let the Material Talk – Technology of Late-medieval Cologne Panel Painting', which from 2009 to 2012, among many other findings, came up with numerous new insights relating to the underdrawings of paintings by Stefan Lochner and his contemporaries.<sup>2</sup> Secondly, the digital infrared camera used in the context of this investigation proved for the first time to be a suitable instrument for the imaging, within a practicable time-frame, of underdrawings of large-format panel paintings of the desired quality.

With support from all sides, we were able, during the night of 20/21 June 2012, to create the images in individual stages and then to digitally assemble them into infrared reflectograms of the whole of the central panel and the insides and outsides of the two wings.

In spite of the underdrawings thus made visible on a large scale for the first time, we should like to make it clear before we go any further that not every available means of graphic pictorial composition can be revealed in the infrared. A further limitation results from the fact that infrared radiation cannot evenly penetrate differently structured and differently pigmented paint layers, while metal leaf is totally opaque to it. In light of these physical facts, it must be borne in mind that only parts of the actually present underdrawings can be revealed and assessed.<sup>3</sup> Nevertheless, the

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<sup>1</sup> The debate concerning the identification of Stefan Lochner as the painter of the 'Altarpiece of the City Patron Saints' will not be addressed in this article.

<sup>2</sup> For the detailed results of the project, see Wallraf-Richartz-Museum & Fondation Corboud Cologne/Bayerische Staatsgemäldesammlungen Munich (ed.) *Let the Material Talk – Technology of Late-medieval Cologne Panel Painting*, London 2014.

<sup>3</sup> See Franz Mairinger, *Strahlenuntersuchung an Kunstwerken* (Bücherei des Restaurators 7), Leipzig 2003, pp. 90–92, 146–147; and Ingo Sandner, 'Wir haben nichts gesehen! Anmerkungen zum Nutzen der IR-Reflektographie', *VDR-Beiträge*, 2008, no. 2, 53–66.

latest infrared reflectograms reveal highly informative compositional plans, which will be presented here for the first time and compared with the picture as painted. During the detailed analysis of the infrared reflectograms, it very soon became clear that the findings were many-layered and extremely complex, and that their presentation would require not only an enormous number of illustrations, but that these would also have to be of a size that seemed barely feasible in the present context. For this reason we are extraordinarily grateful that a freely accessible dedicated page could be set up on the website of the Cologne Cathedral maintenance department ([www.dombau-koeln.de](http://www.dombau-koeln.de)), along with a specific URL [www.altar-der-stadt-patrone.de](http://www.altar-der-stadt-patrone.de). Here can be found, in addition to all the infrared reflectograms, high-resolution colour photographs which allow close and comparative inspection, as well as a selection of detailed views with additional information. This online presentation thus allows not only the illustration on the largest possible scale of the latest findings, but also the opportunity for further research. In this sense, the present article should not be seen in any way as a presentation of final results, but as a further contribution to the critical investigation of the genesis of one of the largest and most important Cologne panel paintings of the Late Middle Ages.

### **State of research into Stefan Lochner's underdrawings**

A first art-technological inspection of the 'Altarpiece of the City Patron Saints' was undertaken in 1985 by the conservation department of the Rheinisches Amt für Denkmalpflege (Rhineland Heritage Protection Office), in the course of which infrared photographs of informative sections of the altarpiece were taken.<sup>4</sup> However, their limited spectral sensitivity (up to app. 930 nm) meant that they revealed the lines of the underdrawing only where the paint layer was thin or easily penetrable. In spite of this limitation, the exercise made it possible for the first time to describe the compositional planning of the 'Altarpiece of the City Patron Saints', and such a description was indeed then produced in 1987 in a comprehensive article following the art-historical and art-technical investigations by Rolf Lauer, Christa Schulze-Senger and Wilfried Hansmann.<sup>5</sup>

On the basis of modern infrared reflectography, which compared with infrared photography ensures far greater spectral sensitivity (up to 2000 nm) and thus also a considerably better penetration of the paint layers, the American art-historian Molly Faries then undertook, a few years later, from 1991 to 1993, a systematic investigation

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<sup>4</sup> The infrared photographs were taken by Michael Thuns, Rheinisches Amt für Denkmalpflege, 1985/86.

<sup>5</sup> Rolf Lauer, Christa Schulze-Senger and Wilfried Hansmann, 'Der Altar der Stadtpatrone im Kölner Dom', in: *KDbl.* 52, 1987, 9–80. The chapters on painting technique ('Maltechnik') and underdrawing ('Unterzeichnung') were reprinted in abridged form and verbatim respectively in *Zeitschrift für Kunsttechnologie und Konservierung*, 1988, no. 1.

of 15 paintings attributed to Stefan Lochner.<sup>6</sup> However, in view of its large size and the technical difficulties this involved given the methods available at the time, the 'Altarpiece of the City Patron Saints' was largely ignored.<sup>7</sup> In August 1993 Faries only used her infrared reflectography equipment on a small section of the lower part of the Virgin's garment.<sup>8</sup>

Faries published the results of her analyses in 1993 and 1996, and thus characterized Stefan Lochner's individual style of draughtsmanship for the first time. As a special feature of his 'stylistically unusually varied' underdrawings she emphasized in particular the 'x-shaped cross-hatching' with which Lochner 'defined not only the plastic attributes of the folds of the garment, but also the distribution of light and shade within the individual form'.<sup>9</sup> In the case of the 'Altarpiece of the City Patron Saints' Faries already drew attention to the clear differences between the underdrawings of the insides and outsides of the wings, not least the absence of Lochner's typical cross-hatching on the outsides.<sup>10</sup>

In the following years, the artist's working method also formed the focus of Julien Chapuis's dissertation and later monograph, which appeared in English in 2004.<sup>11</sup> Considerable importance was thus attached to the analysis of underdrawings, and this led the author to a number of new insights into the artist's training and working method. Chapuis had recourse to Faries's material, and over and beyond this he incorporated the findings of further investigations. With respect to the 'Altarpiece of the City Patron Saints', the author, like Hansmann and Faries before him, was dependent on the evaluation of the not very informative infrared photographs, on the basis of which he presumed a collaboration between at least two different draughtsmen.<sup>12</sup>

Alongside further informative infrared-reflectographic examinations of the underdrawings of paintings by Stefan Lochner in the Städel Museum in Frankfurt,<sup>13</sup>

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<sup>6</sup> Molly Faries, 'Stefan Lochners Unterzeichnungen. Erste Einsichten', in *Stefan Lochner – Meister zu Köln. Herkunft – Werke – Wirkung*, ed. by Frank Günter Zehnder, exhib. cat. Wallraf-Richartz-Museum, Cologne, Cologne 1993, 169–180. According to Mairinger the Hamamatsu infrared vidikon camera N 214 used by Faries had a spectral sensitivity of app. 820 to 2000 nm, see Mairinger (as note 3), p. 110, figs. 4.1–16.

<sup>7</sup> In photographs made using infrared-sensitive tube cameras the resolution is relatively low, so that only small details of the subject can be registered with the desired image quality. Given the dimensions of the triptych in the cathedral, this would probably have meant a total of more than 600 individual photographs.

<sup>8</sup> Molly Faries, 'Robert Campin and Stefan Lochner. Any Connection?', in *Robert Campin. New Directions in Scholarship*, ed. by Susan Foister and Susie Nash, Turnhout 1996, 137–147, here p. 142, fig. 6; p. 146, note 22.

<sup>9</sup> Faries (as note 6), p. 171.

<sup>10</sup> Faries (as note 6), pp. 172–173; Faries (as note 8), pp. 141–142.

<sup>11</sup> Julien Chapuis, 'Underdrawing in Paintings of the Stefan Lochner Group', diss. Bloomington 1996; Julien Chapuis, *Stefan Lochner. Image Making in Fifteenth-Century Cologne*, Turnhout 2004.

<sup>12</sup> Chapuis 2004 (as note 11), pp. 126, 160–165.

<sup>13</sup> Bodo Brinkmann and Stephan Kemperdick, 'Deutsche Gemälde im Städel 1300–1500', in *Kataloge der Gemälde im Städelischen Kunstinstitut Frankfurt am Main 4*, ed. by Jochen Sander, Herbert Beck, Mainz 2002, 181–197.

the most recent findings derive from the research project, mentioned above, entitled 'Let the Material Talk – Technology of Late-medieval Cologne Panel Painting', in the course of which a total of 29 works in the collections of the Wallraf-Richartz-Museum & Fondation Corboud in Cologne and the Bayerische Staatsgemäldesammlungen in Munich were subjected to technological examination between 2009 and 2012.<sup>14</sup>

In order to make visible the underdrawings in the seven paintings linked to Lochner, the digital infrared camera system 'Osiris' was used for the first time. Thanks to its high resolution and automated scanning process, it provides far more sharpness of detail in the images it generates.<sup>15</sup> This leads to more clearly defined lines, which in turn allows more far-reaching statements to be made than hitherto possible regarding the manner and extent of the underdrawings.<sup>16</sup>

In 2012, immediately following the end of the above-mentioned research project, high-resolution infrared reflectograms of the 'Altarpiece of the City Patron Saints' were made using the 'Osiris' digital camera system; these too generated an abundance of new information compared with the existing infrared photographs dating from 1985/86 (fig. 2). Some of the new images were presented to the public at the exhibition 'Secrets of the Painters – Cologne in the Middle Ages' (20 September 2013 – 9 February 2014) at the Wallraf-Richartz-Museum & Fondation Corboud and briefly discussed in the catalogue.<sup>17</sup>

### **Description and characterization of the underdrawings of the 'Altarpiece of the City Patron Saints'**

In what follows, we shall present the various drawing techniques and the nature and extent of the underdrawings themselves, which were executed by at least four people (fig. 3). We shall also draw attention to recognizable corrections ('pentimenti') made during the graphic picture-planning stage. The numerous disparities between the underdrawing and the picture as painted will be dealt with separately in the following chapter.

#### With rapid strokes of a quill

##### The Annunciation scene on the outsides

The outsides of the wings of the altarpiece are underdrawn in a fluid black medium whose application in many places reveals the use of a quill (Latin: 'penna') as the

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<sup>14</sup> See note 2.

<sup>15</sup> The digital camera system 'Osiris' (Opus Instruments) covers the wavelength range 900 to 1700 nm, see David Saunders, Rachel Billinge, John Cupitt et al., 'A new camera for high-resolution infrared imaging of works of art', in *Studies in Conservation* 51, 2006, 277–290.

<sup>16</sup> *Let the Material Talk* (as note 2), pp. 59–83, 276, 286, 294.

<sup>17</sup> *Geheimnisse der Maler. Köln im Mittelalter*, exhib. cat. Cologne, Berlin 2013, pp. 115–119. The observations published there have been corrected here with respect to the number of draughtsmen involved

drawing implement (figs. 4, 5).<sup>18</sup> This is indicated not only by the largely equally broad lines, which begin and end bluntly, and the frequent spreading of the lines as they progress, but also the increased quantity of drawing medium in those places where the pen was put to the picture support, which creates a specific appearance of a number of fairly short lines concentrated in hatching patterns (fig. 6). A further characteristic of the quill, which is far more flexible than pens made of hollow reeds, can be seen in the dynamic alterations in the breadth of the strokes when they changed direction, such as for example in the drawing of the hair. All in all, the lines vary in the flow of the drawing and the course of the stroke, depending on how the pen was held, how much pressure was applied, and how full of liquid it was.<sup>19</sup> In the area of the floor, there are in addition incisions in the ground, which were probably made with a ruler as aids for the painting the tiles.<sup>20</sup>

The underdrawing anticipates the shape, plasticity and position of all the important elements of the picture. The figures of the Virgin and the Archangel Gabriel, along with all the other motifs, are present in detail. All that is missing from the underdrawing are minor details such as the inscriptions on the book, the scroll and the vase, and the masons' marks in the floor slabs. In respect of extent, nature and style, the underdrawings of the outsides of the left-hand and right-hand wings largely match, so that we may presume them to have been the work of a single draughtsman, whose typical characteristic is a free, loose and apparently brisk drawing style, which however displays little stringency in the elaboration of the shading of the areas in shadow. While the main contours clearly outline the motifs, and the faces, including the indications of ears, lips, noses, eyebrows, eyelids and irises, are formulated in detail, the shading of the garments comes across as uneven. It varies from individually placed, widely spaced, long parallel hatching lines, such as can be seen in the Archangel Gabriel's cloak, all the way to an altogether chaotic superimposition of collections of short lines, which for example in the shaded parts of the Virgin's garments near the prie-dieu cover the whole area almost entirely (figs. 4, 5). The cross-hatching seen as characteristic of Lochner's hand is not present anywhere. Instead, here and there can be found a system of shading consisting of a threefold superimposition of short sickle-shaped strokes, each set of lines crossing the preceding one diagonally, producing the effect of a zigzag shading.

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<sup>18</sup> On the quill, see Ingo Sandner, 'Zeichengeräte um 1500', in *Unsichtbare Meisterzeichnungen auf dem Malgrund. Cranach und seine Zeitgenossen*, ed. by Ingo Sandner, Regensburg 1998, 51–60, here pp. 51–54; Andreas Siejek and Kathrin Kirsch, *Die Unterzeichnung auf dem Malgrund. Graphische Mittel und Übertragungsverfahren im 15.–17. Jahrhundert*, Munich 2004, here pp. 76–82. With regard to the 'Altarpiece of the City Patron Saints', it had hitherto been assumed that the underdrawing on all the panels had been a purely 'brush drawing in black paint', see Lauer, Schulze-Senger and Hansmann (as note 5), p. 48.

<sup>19</sup> According to Siejek and Kirsch (as note 18), p. 75, 'drawing pens have a noticeable disadvantage [...], as their function is largely dependent on gravity and demands an horizontal or at least an oblique drawing surface.' If so, the large-format wing panels of the 'Altarpiece of the City Patron Saints' would have had to be positioned accordingly before a drawing could be made with a quill.

<sup>20</sup> Schulze-Senger describes the existence of such incised lines for the prie-dieu too, see Lauer, Schulze-Senger and Hansmann (as note 5), p. 49.

The underdrawing of the outside of the left-hand wing, but nowhere else on the altarpiece, clearly displays signs of a two-stage production process. In the first stage, the draughtsman used thin lines only to fix, in summary fashion, the outlines and a few internal lines of the Virgin's cloak and head. In the next stage, he continued by adding details of hair, face, garment folds and background, and thus also fixed volumes while distributing light and shade (fig. 4). The top half of Mary's garment also displays a further underdrawing stage, which actually came later than the first applications of paint, and represents a correction to the form of the cloak and its clasp. While, to start with, the cloak was held together by a large brooch on her breast, the artist, having already started painting, added more underdrawing lines to change the shape of the cloak, which now falls softly over her shoulders in a more modern fashion, without any kind of clasp (figs. 4, 24).

The perspective constriction of the interior scene is worthy of note. The vanishing lines, visible in the underdrawing, of the elements of the wooden-beam ceiling, the tiled floor and the prie-dieu which are relevant to the perspective are drawn freehand, and each ends in the transition to the adjacent zone of the depiction. If one extends the lines in one's mind's eye, it will be apparent that the vanishing lines of the room do not converge on a single horizon or central point; rather, the descending ceiling lines and ascending floor lines largely meet at vanishing points of their own above and below the middle of the picture. This is a technique known as 'empirical perspective'<sup>21</sup> and can be found, at least rudimentarily, in Cologne as early as around 1420 in the Marian retable by the Master of the Gereon Altarpiece.<sup>22</sup>

A further interesting observation can be made in respect of the background curtain decorated with *pressbrokat*. While the gilding of the curtain prevents all-over revelation, in the infrared reflectogram, of what lies beneath it, at the transitions between it and other zones graphic lay-ins are visible in a number of places, suggesting that the curtain, including its textile pattern and the falls of its folds, was based on a complete underdrawing (figs. 7, 25).

### Typical Lochner

#### St Ursula and her companions on the inside of the left-hand wing

The underdrawing, made with a brush and a black-pigmented drawing liquid, depicts St Ursula and her numerous entourage in largely constant manner and detail

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<sup>21</sup> While in Italy at this time linear perspective on the basis of mathematical calculations was being discovered, the artists of the north arrived at largely correct perspective constructions empirically. See Erwin Panofsky, 'Die Perspektive als "symbolische Form"' [1927], in *Aufsätze zu Grundfragen der Kunstwissenschaft*, ed. by Hariolf Oberer and Egon Verheyen, Berlin 1980, 99–167, here pp. 117–118; Kirsti Andersen, *The Geometry of an Art. The History of the Mathematical Theory of Perspective from Alberti to Monge*, Luxembourg and Berlin 2007, pp. 3–9.

<sup>22</sup> Sven Lüken, *Die Verkündigung an Maria im 15. und frühen 16. Jahrhundert. Historische und kunsthistorische Untersuchungen*, Göttingen 2000, p. 131; Lauer, Schulze-Senger and Hansmann (as note 5), p. 17.

(figs. 8, 9).<sup>23</sup> At the same time, we can recognize significant features of the vocabulary and approach that we already know from the graphic compositional lay-ins of Stefan Lochner's paintings.<sup>24</sup> These include, alongside extensive contours and internal drawings, detailed modelling by means of cross-hatching and shading. The main lines of both the contours and internal drawings, for example in the fall of the folds or the hem of St Ursula's cloak, often consist of juxtaposed strokes, and the frequency with which the brush was lifted from the panel points rather to filling-in than to free development of the shapes. The further elaboration of the underdrawing in the faces comprises circular lines or collections of lines to indicate the eye hollows. Only rarely can we discern more precise drawings of the shapes of the eyes, let alone pupils, such as for example in the case of the face of the companion to the left of St Ursula. Eyebrows, noses and mouths were mostly only sketchily outlined. Chins and necks are defined by short parallel strokes (fig. 9).

The head of the pope, shown on the left above St Ursula, is an exception; his face is underdrawn in more detail and above all with greater individuality than all the others (fig. 10). The lines, some more, some less rich in contrast, could indicate a two-stage underdrawing, which establishes the detail of the nose, mouth and chin, while also extending to the wrinkles of the forehead, eyes and cheeks. Especially in the area of the mouth and chin, individual lines arouse the impression of a certain searching for form, and could therefore point towards an actual portrait.

The draughtsmanship of all the details comes across as comparatively free and at the same time confident, as is particularly clear in the composition of the coiffures, headdresses and various items of jewellery. The extremely detailed and precise underdrawing of St Ursula's brooch is matched by the numerous, mostly loosely sketched coiffures, garlands, diadems and crowns (figs. 8, 9).<sup>25</sup>

For all the pictorial elements, not only the distribution of light and shade, but also the corporeality of the forms are defined by a network, varying in density, of shading and cross-hatching lines. The plasticity of the forms is achieved in particular by the curved lines used in much of the shading; these are sometimes stippled and thus generate soft transitions between light and dark. Many of the parallel shading lines exhibit little hooks, suggesting a certain gusto in execution. This dynamism, resulting at times in juxtaposed arcs or even loops, can be seen in the back and lower areas of the garment of the companion with the green gown. Cross-hatching likewise characterizes the shaded zones in the gaps between the figures, underscoring the three-dimensional effect of the depiction.

Short stippled lines characterize St Ursula's brooch and the depiction of the stylized ermine tails in the banner top right (figs. 8, 29). The drawings of the three lions in the

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<sup>23</sup> The use of brushes is supported by the mostly pointed ends to the lines and the fact that many of them spread out in the course of the stroke. The variations in the breadths of the strokes could be due to the use of different brushes or a variation in the way the brush was handled.

<sup>24</sup> On the characterization of Lochner's underdrawings, see notes 6, 8, 11, 13, and 16.

<sup>25</sup> On these forms of headdress, which were the distinguishing feature of brides in late-medieval Cologne, see Edith Wurmbach, *Das Wohnungs- und Kleidungs-wesen des Kölner Bürgertums um die Wende des Mittelalters* (Veröffentlichungen des Historischen Museums der Stadt Köln 1), Bonn 1932, p. 94.

same banner look like the freehand work of a skilled draughtsman, and never repeats exactly: there is no sign that a stencil or any form of tracing was used.

Speaking of the use of stencils or tracing for repeated motifs or patterns within the painting, we would point to the well-known proof of the use of pouncing in the pale fur-lined fabric of the garment worn by the companion depicted in half-rear view.<sup>26</sup>

This finding however is still a one-off, despite the progress in imaging the underdrawings of all the panels of the 'Altarpiece of the City Patron Saints'.

All in all, only a few pentimenti are discernible in the visible underdrawing. Most of them relate to hand postures. Thus the right hand of the companion in the blue cloak to the left of St Ursula in the first underdrawing version is shown raised, with the palm partly visible, the thumb apart from the fingers, which themselves are slightly bent. In a second version, visible lines change this form into one in which closed fingers hold a chain. In the area of the originally planned hand posture of the companion on the left-hand edge of the picture, which is closely related to the initially planned position of St Ursula's hands, conspicuously dark drawn lines transform a hand hanging down into one lying on the other forearm. The individual, sometimes parallel lines deviate in style and precision from the first drawing to the extent that we might suspect that they were executed by someone else. A further correction in the underdrawing is discernible in the hand at the right-hand edge of the picture, which in both versions is to be assigned to the female figure behind, and to the right of, St Aetherius. At different angles, the lines of the drawing indicate finger shapes which were originally intended to grasp the upper arm of St Aetherius (fig. 11). There is no sign of any graphic lay-in for the form actually executed in the painting, which only seems plausible as the hand of St Aetherius himself. Finally, in the face of the companion to the left of St Aetherius, conspicuously dark and brief lines assign a higher position to the forms, already present in the underdrawing, of the mouth, nose, chin and right eye.

### Two draughtsmen at work

#### The Adoration of the Magi on the central panel

The underdrawing of the central panel visible in the infrared reflectogram reveals the use of at least two different mediums, tools and drawing styles. Thus we can discern an underdrawing, closely related to the inside of the left-hand wing, in the depiction of the throned Madonna with the Christ child, and of individual figures in the left half of the panel (figs. 3, 12, 13). These include, in particular, the male figure on the left-hand edge of the picture, and the kneeling Magus. Even so, the underdrawings of these figures are by no means uniform in respect of their detail. Thus for the face of the Virgin there are few recognizable indications in the drawing, which might point to a motif so frequently repeated that its details no longer need to be expressly clarified. By contrast, the head of the kneeling Magus on the left is elaborated with greater detail and precision in the drawing (fig. 12). A middle position between these

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<sup>26</sup> Lauer, Schulze-Senger and Hansmann (as note 5), p. 54.



two extremes is taken by the head of the male figure at the left-hand edge of the picture, which in the underdrawing was originally placed a little higher and seen more from the side (fig. 14). Not only do the squashed and curiously proportioned facial features, with their ring-shaped eyes, lumpy nose and full lips deviate from the precise drawing of the head of the kneeling Magus, but so also do his hair and beard. In spite of the differences, the graphic style of these three figures matches the typical characteristics of Lochner's underdrawing style, which seems to continue in the headdress of the magus with the flanking hands. But in the vertical sword above the head of the magus, we already see a second kind of underdrawing (fig. 12). It consists of overwhelmingly thick lines of varying intensity. At first sight, one might think the mostly short, sketchy and often fuzzy lines were applications of paint. But in fact very similar lines are evident as graphic lay-ins in many other figures and pictorial elements of the central panel. They occur unmistakably, for example, in the figure at the right-hand edge, as stippled contours of the turban, the hand and the sleeve, and also in the indications of the hem of the garment or the sash (fig. 14). Many short lines with mostly blunt starts and finishes and relatively even breadth create the impression of having been drawn with a short and comparatively broad, possibly worn out, brush. The varying density of the pigmentation between and within the individual lines suggests, however, a paint rather than a homogeneously pigmented drawing fluid. The significant features of this second kind of underdrawing are short, variously spaced strokes to indicate contours and internal drawing lines. In small pictorial elements, such as the figure of the moor in the banner, we can discern a definite stippling approach, parallel stippled lines sometimes drawing attention to a searching for form (fig. 38). Short, too, are the few recognizable parallel hatching lines, for example in the garment of the man at the right-hand edge of the picture. Brief, curved brushstrokes are often used to draw the hair and beards, but these are not often so clearly distinguishable from the painting as they are in the head of the man at the right-hand edge of the picture (fig. 14). One of the reasons may be the 'painterly' style of the drawing. Thus the two headdresses of the men at the right-hand edge clearly reveal how individual brushstrokes spread out and thus come to resemble applications of paint. Finally, the short, broad lines used to underdraw the numerous stars in the banner at the right-hand edge come across as less definite, indeed positively sketchy. By contrast, the corresponding lines describe in comparative detail the small figures of the angels in the background (fig. 15). All in all, this reinforces the assumption that, apart from the underdrawing linked to Lochner and mentioned at the outset, all the pictorial elements were established with broad lines. These preliminary drawings deviate substantially both in their material and stylistically from Stefan Lochner's characteristic underdrawings. As they seem to be superimposed on his typical underdrawing in the sword mentioned above, we may presume that after Lochner, another hand continued and completed the underdrawing of the central panel. Interestingly, in the forms and motifs laid in with broad lines, we see in various places other, mostly very fine lines that could indicate a second underdrawing phase. Thus in the head and collar of the man depicted to the left of the throne, we can

discern horizontal lines in the middle of the mouth, which was originally planned to be shown closed, along with closely placed parallel hatching lines in the left-hand point of the collar, their texture suggesting a dry rather than a liquid medium. Other lines can be seen in the area of the hands of the man with a red hat and blue cloak in the right-hand half of the panel, which may also have been executed in a dry medium. Particularly in view of the coarsely stippled outlines of the hands, these generally precise drawings, which coincide strikingly closely with the painted version, may be an indication of a second underdrawing phase. To this could perhaps also be assigned the finely drawn cross-hatching in the striped pattern of the garment of the man with the red hat, as it is not identical with the painted hatching. An indication that in a second, precision, phase, different drawing mediums may have been used is provided by the recognizable hatching lines in the area of the nose of the young, standing Magus to the right of the Virgin's throne, for they look more like lines made by a brush than with any solid medium. The same is true of the conspicuously dark-looking outline and details of the coat of arms on the scabbard depicted beneath the banner with the moor.

Changes in the form of corrections or pentimenti in the underdrawing should be distinguished from additions intended to make the intentions of the drawing more precise. Among the pentimenti are changes (only vaguely discernible) in the outline of the head of the young man on the left-hand edge of the picture, in the internal drawing and in the mouth area of his face, in individual fingers of Mary's left hand, and possibly also in the thumb of the hand on the extreme right of the picture (fig. 14).

Finally, a change in the first graphic planning of the composition, which cannot be ascertained precisely, is hinted at in the bottom left of the Virgin's cloak (fig. 16). Here, not only do the (in many places, strikingly) broad lines of a (presumably pen) drawing deviate from the rest of the underdrawing of the cloak, but so does the manner in which the hatching is executed. To all appearances, these graphic indications were executed on an existing painted surface.

The use of various drawing mediums, including some not visible in the infrared, is indicated by a symbol in the form of a laterally reversed figure 4 discernible in the collar of the male figure above the kneeling Magus on the left (fig. 17). This symbol is known to us, for it is one of a canon of seven different signs hitherto ascertained in the underdrawings of a number of paintings by Stefan Lochner and the Master of the Heisterbach Altarpiece.<sup>27</sup> Signs of this kind indicate the colour to be used for garments, which is why they are, as a rule, to be found in a number of places in one and the same work. In the 'Altarpiece of the City Patron Saints', however, only one such sign is visible with the aid of infrared reflectography, so that the existence of further indications of colour must be presumed, but in a medium which cannot be rendered visible with infrared radiation.

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<sup>27</sup> *Let the Material Talk* (as note 2), pp. 79–82.

## Brief and to the point

### St Gereon and the Theban Legion on the inside of the right-hand wing

The infrared reflectogram of the inside of the right-hand wing brings out an underdrawing with vigorous, sometimes conspicuously broad lines, which, compared with the central panel and the inside of the left-hand wing, come across as darker and thus point to the possible use of a more strongly pigmented fluid (fig. 18). Here too, the often blunt, angular, or even split starts to the strokes, the mostly short lengths of the latter, and the rhythmic alternation of thin and thick lines in the zigzag hatching in St Gereon's cloak indicate the use of a quill (fig. 19). It must remain an open question how far the considerable variations in the thickness of the strokes are due to variations in the pressure applied to the quill; they may also be due to the use of several quills of different thickness or cut in different ways.<sup>28</sup> In places the lines come across as hesitant and lacking in fluency, as though the handling of the quill was difficult or unsuccessful in places.

The underdrawing, which is revealed in high contrast in the infrared reflectogram, comes across for the most part as sketchy and not very definitive. In mostly coarse strokes, it lays down outlines and internal structures. Only rarely, as we can see for example in St Gereon's cloak, is there parallel hatching with stippled or zigzag lines or vague cross-hatching to indicate light-and-dark modelling (fig. 19). In large areas of the picture, the lines with their short and in places parallel strokes, their intersections and their incomplete joins create the impression of a draughtsman sometimes searching for form, and sometimes being deliberately sketchy. The latter is true above all of many of the faces, in which the eyes are mostly indicated by simple loops, the profiles of the noses by U shapes or hooks, the mouths each by two arcs one over the other, and finally the cheeks and chins by short curved lines, as we see particularly clearly in the head of the man at the left-hand edge of the picture (fig. 20).

The heads of the martyrs in profile at the right-hand edge of the picture, and of the companion depicted frontally on St Gereon's right, form a clear contrast to the sketchiness of the majority of faces (fig. 21). In the case of the former, short lines indicate clearly and concisely the striking facial features which seem strangely cropped by the depiction of a helmet, presumably a sallet.<sup>29</sup> The underdrawing of the head of the warrior further to the left is quite different. Here what we first notice are the largely dark lines, which in sometimes close parallel strokes seek to form the eyebrows, eyes, mouth and chin, and finally loosely sketch the hair and its adornment. On closer inspection, further fine, paler lines are visible in the face, which, as hatching, not only define the shaded areas, but, in individual, more or less dense strokes seem to go on to define the internal structures. In view of this detailed and exploratory underdrawing, it is worth considering whether this may not be the

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<sup>28</sup> See Siejek and Kirsch (as note 18), pp. 77–79.

<sup>29</sup> Visible wipe or abrasion marks at the back of the helmet could indicate a change to the top of the head or to the headdress made during the painting process.

portrait of a real individual.<sup>30</sup> The fine pale lines are in all probability not part of the first stage of the underdrawing but rather of the second, serving to concretize or correct. Thus lines of this kind also occur in other parts of the picture, where they seem to clarify individual forms in detail, or else correct them. Included here for example are details of the design and attachment of the shield-like pieces of metal which serve to protect the armpits, and replace the more usual round besagues. The refining function of these fine lines is particularly clear in the greaves or leg armour of St Gereon. The dark, vigorous lines outline the shape of the greaves only roughly at first, and the angular shape of an articulated plate or 'lame' becomes visible in particular in the poleyn over the right knee. On closer inspection, one can see here two further lines, which are finer and paler. In contrast to the angular form, they define the round contours of the lame (fig. 22). This round shape resembles that executed in paint far more closely than do the angular indications of the dark lines, suggesting an attribution of the fine lines to a second underdrawing phase serving to concretize or correct. However, in many areas it is hard to make a clear distinction between a first and a second underdrawing phase. Thus for example in St Gereon's brigandine (protective waistcoat), the transition between pale thin lines and dark vigorous lines of the original composition is fluid. In the saint's face, one is even tempted to discern a reverse sequence, as here there are fine lines to indicate the slant of the eyes, which to all appearances was later revised by broad, vigorous lines (fig. 20). Thus the different nature of the lines does not allow any consistent attribution where the final definition or correction of the underdrawing on the inside of the right-hand wing is concerned. For this reason, there is also no clarity regarding the identification and chronology of the first lay-in and the pentimenti of the forms of the feet and legs (altered several times) in the lower part of the panel to the left and right (fig. 36).

The interplay of the various drawing lines provides no indication that different draughtsmen were involved in the execution. One gets this impression, if at all, only in the comparison of the drawings, described above, of the two heads in the right-hand half of the picture (fig. 21). But in view of the uneven level of detail in the drawing as a whole, any conclusion in this regard is pure speculation. What we certainly can say, however, is that the stylistic characteristics, noted here, of the dominant underdrawing with its vigorous lines of varying thickness are manifestly different from the preliminary drawings of the other panels of the 'Altarpiece of the City Patron Saints'. For this reason we can assume that at least one other person was involved in the underdrawing of the inside of the right-hand panel.

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<sup>30</sup> There is a similar assumption in Chapuis 2004 (as note 11), p. 59.

## Disparities between the underdrawing and painting of the 'Altarpiece of the City Patron Saints'

On all the panels, the disparities between the underdrawing and the painting are so extensive that a comprehensive and detailed listing would go beyond the scope of this article (fig. 23). It should also be noted that a number of these disparities cannot be fully registered, since the motifs were already laid in using paint, and only changed during the final painting process. In these areas, the underdrawing of the originally planned form is often barely or only partly discernible.<sup>31</sup>

### Simpler and plainer

#### The Annunciation scene on the outsides of the wings

The outsides of the wings display a multitude of disparities, some of them major, between the underdrawing and the picture as painted.

With regard to the left-hand wing, this is true of the elaboration of the figure of the Virgin, her hair, the cloak falling over her shoulders, the posture of her left hand, and the hem of the left sleeve. While the underdrawing shows a Virgin whose slightly bowed head is adorned with a costly ribbon, and whose hair falls over her shoulders in loose, playful waves along her face, the Mary in the painting comes across as far more contemplative with a hair ribbon set with pearls and hair carefully combed behind her ears and back. The form of her upper body too was simplified, for the cloak we now see falling simply over her shoulders is, in the underdrawing, still clasped in the middle of her breast by a large bejewelled brooch (fig. 24).

The prie-dieu, decorated with blind tracery, also underwent a major, indeed twofold re-design in the course of the painting process (fig. 25). In the underdrawing, the top surface, along with the book, was broader and higher. In addition, the front, which is cropped by the edge of the picture, was almost completely hidden behind a hanging cloth. To judge by the folds and the broad, fringed border, this may have been a continuation of the curtain in the background, which would thus have framed the depiction on the left-hand edge of the picture. In the painting, the curtain was never executed in this position, however, probably not least because placing it in front of the prie-dieu would have led to a flattening of the perspective. In the further painting process, the rosette, which fills up one side of the prie-dieu, was also omitted. Instead, a different form of tracery, consisting of a rose, trefoils and lancets, was painted. Before the painting process had come to an end, however, a further rethink took place, and the final version takes the form of blind tracery consisting of intersecting ogees. All three forms of decoration represent varieties of tracery from the Parler period, and go back stylistically to the fourteenth century. The first two, based on roses, exhibit striking structural errors, however (e.g. in the odd number of

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<sup>31</sup> Schulze-Senger pointed as long ago as 1987 to changes during the painting process on the outsides of the wings, the inside of the right-hand wing and the central panel, see Lauer, Schulze-Senger and Hansmann (as note 5), p. 50.

lancets in the rosette, in the radial reference, and the symmetry), so that we must assume that the draughtsman or draughtsmen and painter(s) were not very familiar with Gothic architectural geometry, and doubtless decided to reject these forms because they were simply unsuccessful. The intersecting ogee motif as finally chosen was easier to construct and commonly found in Cologne, for example in the choir of the Cathedral and on the long walls of the Hansasaal in the City Hall.<sup>32</sup>

Some changes vis-à-vis the graphic lay-in, marginal by comparison, can also be found in the backrest of the bench, the vase placed upon it, and the apparatus for hanging the brocade curtain. Also worthy of note is the oblong opening in the ceiling in the underdrawing, through which the Holy Spirit could enter the scene in the form of a dove; curiously, and presumably at a later date, this was painted over, so that when we look at it today, we hardly register it as an opening at all.

The finished painting of the outside of the right-hand wing displays fewer deviations from the underdrawing. One is the gaze of the Archangel Gabriel, which in the underdrawing is directed at the scroll in his hands, in the painting by contrast at the Virgin. Other changes relate to the shape of the scroll, and to the clasp of the cloak (fig. 26). Interestingly, the underdrawing does not yet show the figure of God the Father on the large clasp of the angel's cloak.<sup>33</sup>

### Less is more

#### St Ursula and her companions on the inside of the left-hand wing

In the painting of the central figure of St Ursula, the underdrawn shapes of the head were largely realized; by contrast, there were major changes made in her hand posture and in the shape and decoration of her garment. While the underdrawing shows her right hand in a loosely hanging posture, the painted version has it folded together with her left hand (fig. 27).<sup>34</sup> Further disparities between the underdrawing and the painted version involve the shoulders, the décolleté, the brooch (which is far larger and more detailed in the drawn version) and the fall of the folds, whose exuberant curves in the drawing have given way in the painting to something comparatively simpler, with straight lines (fig. 8).

The companion depicted to the left of St Ursula was planned in the underdrawing not in a half-rear view, but more in profile, with her head somewhat more bowed, while the silhouette of her figure was narrower. In the painted version, this change in the depiction of her garment had numerous consequences for the fall of the folds. In addition, the fabric of the cloak hanging over her arm and her turban-like headdress were more decorated in the underdrawing; these decorations were removed in the

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<sup>32</sup> We owe the interpretation of the tracery in the context of Gothic architectural geometry to a written personal communication from Norbert Nussbaum dated 3 September 2014.

<sup>33</sup> See Lauer, Schulze-Senger and Hansmann (as note 5), p. 20.

<sup>34</sup> The shape of the downward pointing hand can be found in the depiction of St Ursula in an initial of the Darmstadt Book of Hours: Stefan Lochner, *Stundenbuch*, c. 1451, Hessische Landes- und Hochschulbibliothek Darmstadt, Hs 70, fol. 197r.

painting, as were the open strands of hair which reached down past her waist, being replaced by a plait.

The reduction in adornment between drawing and painting is also evident in the group of companions. Thus the underdrawing envisaged, for many of their heads, an extensive and elaborate decoration with garlands, headbands, bonnets and diadems (fig. 28). The reduction in headdress decoration, and indeed the entire rejection of some elements, led in many cases to an extended depiction of the faces. As this was not by any means true for all of them, however, the greater visibility of the faces was probably not the clinching reason for the large-scale reduction of the headdresses in the painted version. In addition, the outlines and internal drawings of the eyes, noses and mouths of many of the companions' heads were changed or moved during the painting process, although no general principle can be discerned. While in the left background a single head took the place of two heavily overlapping heads in the underdrawing, on the right-hand edge of the picture a head crops up for which apparently there is no underdrawing, and which, presumably by dint of the originally planned diadem of the person beneath, was probably not even envisaged (figs. 9, 28).

By contrast, the head of St Aetherius evinces no underdrawing of the painted wreath of leaves which assimilates his head to the painted headdresses of St Ursula's retinue. His mouth, closed in the drawing, is slightly open in the painted version (fig. 28). Particularly notable alterations were made to the banner in the right background, which, with the depiction of lions 'passant guardant' and the heraldic ermine tails, represents a quartering of the arms of England and Brittany, and thus makes reference to the countries of origin of St Ursula and St Aetherius respectively (figs. 29, 30). In contrast to the underdrawing of this quartering of the arms, presumably an instance of 'attributed arms',<sup>35</sup> the lions in the painted version each have a crown.<sup>36</sup> Also changed in the painted version, finally, was the planned depiction of the heraldically stylized ermine tails in the other two quarters. The number of tails – ten in the top left quarter and eleven in the bottom right – can hardly have been a coincidence. The ten top left will have symbolized the ten virgins who, according to the 'Legenda aurea' written by Jacobus de Voragine in around 1363, St Ursula asked to accompany her. The eleven bottom right would then stand for the saint's wish, recorded in the same work, that she and the ten desired companions should each have 1000 further companions, thus giving rise to the traditional figure of 11,000,

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<sup>35</sup> Imaginary coats of arms attributed after the event to famous personages who lived in pre-heraldic times are known in German as 'Fabelwappen', for which information we are grateful to Rolf Sutter (in English they are known as 'attributed arms', MS). According to him, we should presume that Lochner had seen a combination of the two coats of arms in the form in question, which corresponds to 'marital arms', where, following the marriage or betrothal of the couple, the arms of the two families were combined, mostly by the creation of four fields.

<sup>36</sup> According to information kindly provided by Rolf Sutter, crowned lions are a further variation on the English arms, as the following example shows: *Das Wappenbuch Conrads von Grünenberg, Ritters und Bürgers zu Constanz*, c. 1480, Bayerische Staatsbibliothek, BSB Cgm 145, <[http://daten.digital-sammlungen.de/bsb00035320/image\\_47](http://daten.digital-sammlungen.de/bsb00035320/image_47)>.

represented here by the number eleven. Accordingly, the original design of the banner in the underdrawing anticipates an important element of the later civic coat of arms of Cologne, which did not include either flames or ermine until 1475.<sup>37</sup> In the painted version, the heraldic ermine tails are much smaller and above all more naturalistic, making them almost imperceptible to the normal beholder of the triptych, then as now.<sup>38</sup>

### Alterations to details

#### The Adoration of the Magi on the central panel

On the central panel, it is more difficult to discern disparities between underdrawing and painting in some areas because some motifs were laid-in using paint, and then changed during the painting process. This applies for example to the figure at the left-hand edge of the picture, where deviations from the graphic indications are still easily recognizable in the area of the head, the decorative elements of the clothing, and the hands (fig. 14), but unclear in the positioning of the legs. This is true not least in view of the shapes of the feet between the parted legs, which can hardly be reconciled with the person at the left-hand edge of the picture, but which produce pale images in the infrared reflectogram and were presumably part of the planned composition.

By contrast, it may be taken as certain that the sword held by this character was originally planned to be totally visible, although in the painted version it is partly hidden by the man's leg (fig. 31). On the other hand, only partial graphic indications can be discerned for the pale blue fabric of the garment, which, starting from his left upper arm, is artfully curved and falls, with many folds, down past the lower hem of his tunic; this more elaborate execution may therefore only date from the painting stage.

Disparities between the underdrawn and painted shapes of the hands represent a repeated phenomenon. They range from changes in the position of individual fingers, such as in the Virgin's hands, all the way to exchanging the left and right hands of a single person. Thus the drawn lay-in of the male figure on the right-hand edge of the picture envisaged that his left hand would hold the pole of the banner, but in the actual painting this planning was rejected, and his right hand now performs this task (fig. 32).

Among the few discernible disparities between the underdrawing (in any case often only weakly visible) and the version as painted are, in the faces, the shapes of the mouths, which, in the case of the man standing to the left of the throne and the young Magus with the long wavy hair to the right of the throne, are both closed in

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<sup>37</sup> It was only during the Counter-reformation that the civic arms of Cologne began to incorporate the attributed arms of St Ursula with eleven ermine tails (or flames), and for a long time this exact number was by no means binding. See Heiko Steuer, *Das Wappen der Stadt Köln*, Cologne 1981, pp. 42, 69.

<sup>38</sup> On general limitations regarding the legibility of the painting of the 'Altarpiece of the City Patron Saints', see Chapuis 2004 (as note 11), p. 66; Lauer, Schulze-Senger and Hansmann (as note 5), pp. 10–11.



the underdrawing, but open in the painting, with some of the teeth visible. In the head of the Magus, the sketchily laid-in band of pearls is shifted further up his forehead, where it is shown in more detail and with more ornamentation.

Further disparities also mark the headdress of the man beneath the banner with the moor's head. In the underdrawing his hat reached down on one side markedly further over his cheek and ended just above his fur collar. The curved lines of the drawing beneath it could however represented a curl of hair, which was omitted in the painting, the shortening of the hat at the side making it possible to show a head of curly hair instead.

In the clothing there are in turn numerous recognizable disparities between the underdrawing and the painted version. If we ignore for the moment the changes in the fall of the folds of many of the garments, which can hardly be shown in detail, what must be mentioned above all in this connexion are the shapes and decorative elements of the hems of the garments. For the Magus kneeling on the left, the underdrawing of the cloak envisaged a round-ended slit above the girdle, which in the painting was realized further down and largely covered by the purse. An underdrawn pearl decoration of the hem of his sleeve was omitted in the painting entirely, as were the planned ornamental elements in the hems of the garment of the man at the right-hand edge of the picture.

In the area of the costly metal vessels, we can see at least hints of differences between the drawing and the painting. The goblet in the hands of the young standing Magus, already described on account of its sketchy underdrawing, deviates at least in the horizontal structuring of its foot from the painted version. Discernible underdrawing lines in the area of the gold casket in the foreground draw attention to its previously differently envisaged position.

In the depiction of the banners of the Magi, finally, we can see major changes vis-à-vis both the underdrawing and forms already painted. The latter is true in particular of the banner top left with the crescent moon and star. In the infrared reflectogram both motifs are laterally reversed relative to the position finally chosen. The originally larger star also displayed central reinforcements of the individual rays. In addition, the banner and streamer have pale lower edges. Furthermore, in the final version, the moon and star have changed places, the star is reduced in size, and the pale edge has disappeared in favour of a monochrome blue for the banner and streamer. Interestingly, both versions of the arrangement of star and moon are found in contemporary depictions of the arms of the Magi.<sup>39</sup>

In the banner with the depiction of the moor, the painting deviates in numerous respects from the underdrawing (fig. 38). The latter reveals, in the infrared reflectogram, two raised arms bent at the elbow, the left arm holding a beribboned lance whose lower end seems to indicate a position in front of the body. The drawn lay-in of the head is only weakly visible, which is shown in profile facing left, and, with densely sketched hair is, in total, larger than the head in the painted version. The underdrawing of the upper body shows in addition that it was turned more

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<sup>39</sup> These include the manuscripts mentioned in notes 53 and 55.

markedly to the left. In the painted version, the moor is shown frontally, fashionably dressed in a short garment with hat and boots. A sword is attached to the girdle around his hips, in his right hand he holds a lance which is moved to the left relative to the underdrawing, and has a streamer attached.<sup>40</sup>

In the starry banner on the right-hand edge of the picture, finally, the star motifs, only sketchily underdrawn, are smaller in the painted version.

### A peaceable armed force

#### St Gereon and the Theban Legion on the inside of the right-hand wing

In the comparison between the underdrawing and the painting, our gaze is immediately directed towards the depiction of the central figure of St Gereon. The underdrawing here envisaged a brigandine with a jewelled v-neck, which in its further elaboration seemed in part to emulate the musculature of the masculine chest, and is also provided with a chain (to hold a weapon) running diagonally across the torso (fig. 33). While the painted version retains the basic shape of the brigandine with a belt and a cloth garment and mail-shirt underneath, the further elaboration is completely different. We have an upper garment of costly fabric, with a round neck; the belt and hems are richly decorated with pearls, and on the breast we can hardly overlook a highly decorative and bejewelled cross.<sup>41</sup> The shield-like pieces of metal at the level of the armpits were, in the drawing, originally larger. Their fastenings, on the right in fact with two loops, were changed both in their shape and in their position in the finished painting. A further loop in the underdrawing, which was presumably there to fasten the plate protecting the right armpit using the same technique, was omitted in the painting, as was the planned hem pattern of the garment protruding from beneath the shoulder plate. In addition, the infrared reflectogram reveals that St Gereon's cloak originally spread out further over the ground and covered much of the pole of the banner.

The depiction of his neighbour to the right, who carries a sword, was changed relatively little. The alterations are limited to slight changes to the shape of the guard of the sword, the hilt, and the pommel of the right knee, and to the addition of a moustache in the painted version.

There are striking differences between the underdrawing and the painting of the warrior further to the right, who is holding a pole weapon (fig. 34). The biggest disparity is in the depiction of the head, which in the underdrawing has a helmet pulled down well over the forehead and a face with striking, one might even say grim features, but in the painting is transformed into the portrait of a young man with soft and friendly features, and curly hair decorated with a garland of flowers.

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<sup>40</sup> Owing to lack of sharpness of detail in the image, it has not been possible hitherto to identify the inscription on the ribbon. Clemens M. M. Bayer kindly informed us in writing on 18 June 2014 that it may be a fantasy script.

<sup>41</sup> See Hans Peter Hilger, 'Das Brustkreuz des St Gereon auf dem Altar der Kölner Stadtpatrone von Stephan Lochner', in *Rhein und Maas. Kunst und Kultur 800–1400*, ed. by Anton Legner, exhib. cat. Cologne 1973, vol. 2, 467–472.

Immediately next to his head the drawn forms of an axe-head, a spike and probably a hook draw attention to the originally planned depiction of a battle-axe.<sup>42</sup> In the painted version, the pole was shortened and took on the form of a war hammer, a less dangerous weapon which served mainly to dent or break armour. Also omitted was the originally planned hand-guard, which to all appearances was already laid-in in paint. In addition, the underdrawing seems to have envisaged for the garment not only dagged hems, but also dagged fringes, a form of decoration which was abandoned in the painting in favour of simple cloth ribbons. The shapes of his legs and feet are characterized by smaller deviations, the spur in the drawing being omitted in the painting.

The figure of the warrior on the left-hand edge of the picture likewise displays a few changes. In the drawing his left leg was longer, and positioned further to the right than we see it in the painting. His shoe likewise seems to have had at least the hint of a spur in the drawing. As for his armour, consisting of a cuirass with plackart and cuisses, there are few disparities apart from the besague on the left, which was probably originally planned to be smaller. At a late point in the painting process, a completely new feature, his sword, was added; it seems to have been neither present in the underdrawing nor reserved when the painting was carried out. The hand gripping the hilt was initially resting on the plate armour (fig. 35). The warrior's head with a very sketchily planned face was executed in the painting in the same posture as in the drawing, but slightly lower down (fig. 20).

A comparison between the indications in the underdrawing and the execution in paint reveals not only shifts in the internal drawings, but also changes to the attitudes of the heads of many of the warriors in the background. Even though the extremely sketchy indications hardly allow comparisons to be made with the painted physiognomy, it is clear that there is an overarching phenomenon. Thus the largely drooping corners of the mouths in the underdrawing contribute to grim, not to say threatening faces in many instances, but these are transformed in the painted version into much friendlier and softer physiognomies.

The lack of commitment displayed by the sketchy indications of the warriors in the background is confirmed by the numerous corrections not only to the underdrawing but also to items already painted. This is particularly evident when we look at the six foot shapes visible in the infrared reflectogram between the two legs of the warrior on the left-hand edge of the picture. They were not only laid-in in the drawing, but also partly painted, but except for just one foot, they were all overpainted with the background green of the grass (fig. 36).

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<sup>42</sup> On the assumption that this is the weapon depicted is a battle-axe rather than a halberd, see Wendelin Boeheim, *Handbuch der Waffenkunde. Das Waffenwesen in seiner historischen Entwicklung vom Beginn des Mittelalters bis zum Ende des 18. Jahrhunderts* (Seemanns Kunstgewerbliche Handbücher 7), Leipzig 1890, p. 376.

## From the first lay-in to the painting

### Development and context of the underdrawing

The underdrawings revealed by the infrared reflectogram on the total of five panel sides of the 'Altarpiece of the City Patron Saints' display neither fundamental developments in the form or arrangement of the figures or motifs, nor in the perspective construction, so that we must presume prior compositions.<sup>43</sup>

It is open to question, in this context, whether the corresponding compositional drawings were made on the primed panels themselves, as is generally assumed for panel painting up until the middle of the fifteenth century,<sup>44</sup> or whether there were preliminary drawings physically separate from the work, whose lines were then transferred to the panels.<sup>45</sup> While the infrared reflectograms themselves do not suggest any such graphic preliminary stages, their existence cannot be ruled out by any means, as such lines could be either covered over, removed after being fixed with a fluid drawing medium, or else are simply not revealed by the infrared.<sup>46</sup> Little information is to be gained either from the main lines and contours which can be seen on all the panels, and whose described characteristics point to the tracing of an existing form. For here too, it is uncertain whether these lines came about as the result of tracing over existing lines on the panels themselves, or were the result of a largely freehand redrawing of separate compositional designs. When looking at the underdrawings of many individual motifs and details as revealed by the infrared reflectograms, most of them executed very freely and skillfully, but varying greatly in their detail and precision, some indeed being extremely sketchy, one is tempted rather to think in terms of a largely freehand transfer of physically separate preliminary drawings.<sup>47</sup>

We may with some certainty assume the existence of auxiliary or orientation lines on the panels at some stage, which today cannot be revealed in the infrared. A vague clue to their presence could be an arc-like stroke, independent of the motif itself, in the underdrawing on the inside of the right-hand wing, which extends from the left-

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<sup>43</sup> This was already assumed by Chapuis, who does not however go into its possible texture in detail. See Chapuis 2004 (as note 11), pp. 130, 163.

<sup>44</sup> See Siejek and Kirsch (as note 18), p. 158; Rolf E. Straub, 'Tafel- und Tüchleinmalerei', in *Farbmittel, Buchmalerei, Tafel- und Leinwandmalerei* (Reclams Handbuch der künstlerischen Techniken 1), 2nd ed., Stuttgart 1988, pp. [125]–259, here p. 160.

<sup>45</sup> Terminologically German distinguishes between 'Unterzeichnung' (underdrawing) as a compositional lay-in on the same picture support as the eventual painting, and 'Vorzeichnung' (preliminary drawing) as a preparation of the composition on a separate support, see Straub (as note 44), p. 160. (This distinction is followed here in English thus. MS)

<sup>46</sup> See Siejek and Kirsch (as note 18), p. 56; Straub (as note 44), p. 160; Sandner (as note 18), p. 59.

<sup>47</sup> These characteristics are in stark contrast to the technical underdrawing (*werktechnische Unterzeichnung*), in which preparatory images are mechanically transferred by a variety of methods. In the case of the 'Altarpiece of the City Patron Saints' no indication has been discovered to date of the use of traditional transfer techniques, including, alongside *spolvero* and *calcho*, also squaring. See Siejek and Kirsch (as note 18), pp. 182–215.

hand side of the lower edge of the panel as far as the point of St Gereon's foot (fig. 37).

A number of clues suggest that the hypothetical separate preliminary drawings did not represent detailed compositional designs. They may even have been no more than projections in the sense of presentation designs or contract drawings. While such drawings, also known as patterns,<sup>48</sup> are only known in the context of Cologne painting from the 1520s through surviving contracts with Bartholomäus Bruyn the Elder, they may well have been normal practice earlier.<sup>49</sup> As documented for Bruyn, reduced-scale drawings should also be considered for the planned altarpiece.<sup>50</sup>

Generally, such drafts were mostly small-scale and incompletely worked out, but they did establish all the major features of a planned painting.<sup>51</sup>

On this assumption, at least the (if anything, sparse and sketchy) underdrawings in large areas of the central panel and on the inside of the right-hand wing would be explicable. While these may only reproduce the main lines of the presentation drafts, the more detailed underdrawings on the outsides of the wings, the inside of the left-hand wing, and in places also on the central panel may represent further developments of the transferred preliminary drawings, a process that was in principle normal.<sup>52</sup>

That the separate preliminary drawings did not clarify all the motifs in detail and that probably further drawings were also used is suggested not only by the underdrawing of the fictitious banner of St Ursula on the inside of the left-hand wing, but also by the flag with the moor on the central panel (fig. 38). In the latter case, the graphic indications reveal the knowledge and use of different pattern drawings, which were combined in the underdrawing and underwent further substantial alteration in the painting process. Thus the graphic indications display at first striking parallels with moors in the 'Codex Gelre', which dates from between 1369 and 1396<sup>53</sup> (fig. 39).<sup>54</sup> The depiction of the moor there, with his head in profile

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<sup>48</sup> See Georg Habenicht, 'Die ungefassten Altarwerke des ausgehenden Mittelalters und der Dürerzeit', diss. Göttingen 2002, p. 102 <<http://hdl.handle.net/11858/00-1735-0000-0006-B385-4>> [accessed on 31 July 2014].

<sup>49</sup> In the surviving contracts of the chapter of the Xanten collegiate church with the painter Bartholomäus Bruyn the Elder and the Cologne joiner Wilhem van Ruremunde, the terms 'exemplar' or 'exemplair' indicate corresponding preliminary drawings. See Horst-Johannes Tümmers, *Die Altarbilder des älteren Bartholomäus Bruyn*, Cologne 1964, pp. 132–133; Brigitte Corley, *Maler und Stifter des Spätmittelalters in Köln 1300–1500*, Kiel 2009, p. 50; Hans Huth, *Künstler und Werkstatt der Spätgotik*, 4th ed., Darmstadt 1981, p. 27, p. 91, note 41; *Art in the making. Underdrawings in Renaissance paintings*, ed. by David Bomford, exhib. cat., London 2002, p. 48.

<sup>50</sup> After all, the picture supports for the high altar of the collegiate church in Xanten were to be made 'nae enen exemplair meister Bartholomeus meelre hefft op den hoegen altaer to Xanten to maicken nae proportion van hoegeden ind breyden als sych gebort und eysch' ('in accordance with a contract design, which Master Bartholomeus must make for the high altar in Xanten using proportions of height and breadth as are proper and required'). See Tümmers (as note 49), p. 133.

<sup>51</sup> Siejek and Kirsch (as note 18), p. 24.

<sup>52</sup> Siejek and Kirsch (as note 18), p. 24.

<sup>53</sup> *Codex Gelre*, c. 1370, Royal Library of Belgium, Brussels, Ms. 1565L-5, fol. 28v. The collection of coats of arms includes that of the city of Cologne, based on designs from the city.

facing left and the two raised arms bent at the elbow, is reflected very closely in the underdrawing of the flag with the moor in the 'Altarpiece of the City Patron Saints'. However, the arm with the raised hand has changed places with the arm holding the lance. The underdrawing of the figure of the moor does however include individual elements which evince parallels with a coat of arms of the Magi in surviving manuscripts of the council chronicle written by Ulrich von Richental sometime after 1420 (fig. 39).<sup>55</sup> After all, the depiction of the moor there shows a red fluttering ribbon as a component of his headdress, which seems to agree in form and position with the long curved line and dabbed sequence of strokes in the flag with the moor on the 'Altarpiece of the City Patron Saints'. Further similarities can be seen in the fluttering streamer, whose pole is depicted on the same side in each case with a similar hand and arm posture.

The flag with the moor is the best example of the numerous, sometimes striking disparities between the underdrawing and the painting which can be seen on all the pictures. The whole spectrum comprises changes of form, position and size of contours and internal drawings of the individual figures and motifs. Individual elements were both added and deleted at the painting stage. Numerous facial features also underwent substantial alterations. How can we explain these numerous changes, which took place both at the underdrawing stage, between this and the painting stage, and finally during the painting process itself?

Some of the alterations, such as in the prie-dieu of the Annunciation scene, were doubtless made on grounds of uncertainty as to the form the motif should take and with a desire for improvement or greater precision; others by contrast may be due to lack of detail and precision in the underdrawing, such as we find in places on the central panel and on the St Gereon panel.

Some changes, both during the underdrawing stage or between the underdrawing and the painting, may have been initiated as a result of workshop-internal revisions to the graphic planning. In this context, it should be remembered that in all probability, the panels were created individually in the workshop before being assembled into a triptych at their eventual destination.<sup>56</sup> The assembly of the panels, whether it was to test the inside or outside view of the altarpiece, could have triggered a number of corrections. This would explain, for example, the correction, described above, of the drawn head posture and eye position of St Gereon on the inside of the right-hand wing, because only when the altarpiece is opened can one

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<sup>54</sup> Hans Horstmann, 'Die Wappen der Heiligen Drei Könige', in *KDbl.* 30, 1969, pp. 52–53; Marinus Flokstra and Ralf G. Jahn, 'Herold Gelre. Das mittelalterliche Heroldswesen und der geldrische Adel im Codex Gelre', in *Gelre – Geldern – Gelderland. Geschichte und Kultur des Herzogtums Geldern*, ed. by Johannes Stinner and Karl-Heinz Tekath, Geldern 2001, pp. 395–402.

<sup>55</sup> Ulrich von Richental, *Chronik – St. Georgen* 63, 70r, Konstanz, c. 1470, Karlsruhe, Badische Landesbibliothek <urn:nbn:de:bsz:31-37921>. The use of other references cannot be ruled out, for the shape of the spread legs can be seen for example in the 'Exempla' of the 'Ingeram Codex'.

<sup>56</sup> On the erection and assembly of altarpieces at their destination, see Habenicht (as note 48), pp. 111–112.

see the line of sight between him and the companion in the green gown on the inside of the left-hand wing.<sup>57</sup>

The kind and extent of many further disparities can however hardly be explained by these criteria. This is true in particular of a group of changes on the insides of the left and right-hand wings that can be related to each other, and which are fundamental in their nature. Thus the underdrawing on the panel with the depiction of St Gereon and his retinue makes it clear that this scene had been planned to look far more warlike, while the version as actually painted conveys a far more peaceable impression. No less revealing are the numerous disparities between the underdrawing and the painting in the depiction of St Ursula and her companions on the inside of the left-hand wing. Thus in the drawing, numerous garlands, headbands, bonnets and diadems on the heads of the virgins are indicated, which in the painted version were either simplified or omitted entirely. Thus originally, when the altarpiece was opened, and the insides of both wings could be seen together, a stronger contrast was planned between the gentle appeal of the virgins in St Ursula's retinue and the combativeness of the Theban Legion under their officer Gereon.<sup>58</sup> Such comprehensive changes of plan are difficult to explain purely by a revision on the part of the master or his assistants. Nor can the planned, but not executed, brooch as a clasp for the Virgin's cloak, and the changes to the banner above St Ursula's retinue, really be explained by a workshop-internal revision of the underdrawn composition. Rather, this kind of change suggests the intervention of persons outside the workshop.

It seems altogether plausible that the client or clients could have initiated these and other changes after they had personally inspected the underdrawings. Even though such procedures have hitherto been demonstrated only in individual cases, they could, particularly in the case of large-format and important paintings, have been entirely normal practice.<sup>59</sup>

Such an inspection of the compositional plans for the 'Altarpiece of the City Patron Saints' would also explain the presumably all-over underdrawing of the patterns of the brocade curtain in the Annunciation scene, for from a purely technical point of view graphic indications of the cloth pattern would, as far as the workshop was concerned, not have been necessary for a planned execution with applied *pressbrokat* leaves.<sup>60</sup> If we further remember that the (in some cases) very sketchy indications of the heads in the background of the St Gereon panel or in the starry banner on the central panel could hardly have functioned as a satisfactory lay-in for the execution in paint, they too may have served primarily to illustrate the planned composition for the benefit of the clients.

Some of the sketchy indications, such as the head at the right-hand edge of the St Gereon panel, seem to have tossed off so rapidly that we must assume a degree of

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<sup>57</sup> Chapuis 2004 (as note 11), p. 64.

<sup>58</sup> See *Geheimnisse der Maler* (as note 17), pp. 115–119.

<sup>59</sup> See *Art in the making* (as note 49), pp. 38, 48.

<sup>60</sup> On the nature and size of the *pressbrokat* leaves of the curtain on the outsides of the wings and on the central panel, see Lauer, Schulze-Senger and Hansmann (as note 5), pp. 51–52.

haste on the part of the draughtsman. The division of labour noted in the underdrawing of the central panel and the insides of the two wings might also point to deadline problems. In view of the underdrawings of the St Ursula panel and parts of the central panel, which are typical of Lochner, it is certainly possible that originally the master himself was to execute the graphic compositional planning of the insides of the panels, and an assistant the outsides. Deadline problems, possibly relating to an agreed presentation of the underdrawings to the clients, may have caused Lochner to entrust the completion of the underdrawings on the central panel and the St Gereon panel to two further assistants. This thesis is also perfectly compatible with the possibility that at the time of an assumed appraisal of the underdrawing, paint had already been applied in some areas. For ultimately this procedure could also indicate a certain pressure of time, as many painter's workshops at this period were contractually bound to keep to agreed deadlines.<sup>61</sup>

### **Concluding remarks on underdrawing and painting**

The existence of numerous disparities between the painting and the discernible underdrawing, which, quite apart from this, is in many places very sketchy, raise the question of what the detail of the final painting was actually based on. Only in a few areas can we discern any detailed indications in the drawing that could have guided the subsequent applications of paint with any precision. The extent to which these detailed indications may only represent a fraction of the total of the graphic lay-in, which may not be visible in the infra-red, is therefore an open question. However, we must remember in principle that underdrawings only represented an aid to orientation, while further development and elaboration could take place during the painting process itself.<sup>62</sup>

In the case of the 'Altarpiece of the City Patron Saints' the disparities noted here, as well as the rudimentary graphic indications, seem too numerous to be able to attribute any further development or definition in the course of the first applications of paint only to the master himself, as has hitherto been presumed.<sup>63</sup> Rather, the underdrawings now made visible for the first time reveal a considerable number of assistants, who, given their skills as draughtsmen, will probably also have been capable painters. On the basis of the underdrawings we have analysed, there must have been at least four people at work. The first is the well-known hand we associate with Stefan Lochner, which can be seen to the exclusion of all others on the St Ursula panel, but only in some places on the central panel. In large areas of the latter, we can detect a further hand involved in the graphic lay-in, one that is not recognizable in the remaining underdrawings. No less individual is the graphic compositional planning on the St Gereon panel, but here at least one further draughtsman seems to

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<sup>61</sup> Huth (as note 49), pp. 28–29.

<sup>62</sup> See *Art in the making* (as note 49), p. 24.

<sup>63</sup> Chapuis 2004 (as note 11), pp. 164–165 .



have been at work. With the stylistically closely related underdrawings of the Annunciation scene on the outside, which in their turn differ from all those on the insides of the wings and the central panel, a fourth draughtsman makes himself known.<sup>64</sup>

Interestingly, the presumed assistant in the underdrawing of the central panel of the 'Altarpiece of the City Patron Saints' appears to turn up in a further work by Stefan Lochner, namely the panel 'Christ on the Cross between Saints' in the Germanisches Nationalmuseum in Nuremberg. This is suggested by striking material and stylistic similarities in the underdrawings of the two works.<sup>65</sup>

For the first time, then, a picture of Lochner's workshop begins to emerge, a workshop which in view of the latest findings seems to have been larger than average.<sup>66</sup> In the case of the 'Altarpiece of the City Patron Saints' it remains all the more fascinating (as well as unexplained) how, given the number of different hands involved in the underdrawing and probably also in all stages of the painting, an in many respects homogeneous complete work was achieved.

We should perhaps also reconsider the dating of the completion of the work, which has hitherto been put at about 1442, as this date is largely based on the depiction of a stag beetle on the inside of the right-hand wing, and its presumed connexion with the Hirtze family and the election to the city council of Eberhard vom Hirtze in that year.<sup>67</sup> This association appears dubious in view of conspicuous parallels in the depictions of St Gereon on the inside of the right-hand wing of the 'Altarpiece of the City Patron Saints' and the outside of the right-hand wing of the triptych 'Christ on the Cross with the Virgin and the Twelve Apostles', now in Bamberg, which, in line with recent discoveries, is no longer attributed exclusively to the Master of the Heisterbach Altarpiece, but is regarded as a work created jointly by him and Stefan Lochner at some time during the 1430s (fig. 40).<sup>68</sup> For after all, the underdrawing of St Gereon on the 'Altarpiece of the City Patron Saints' with the originally planned head, inclined slightly to the left, the oblique cast of the eyes, the hat pulled down further over the forehead, the painted brooch on the hat, and the total posture of the figure,

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<sup>64</sup> Chapuis already recognized Lochner's hand on the central panel and the inside of the left-hand wing. The underdrawings of the outsides, by contrast, he attributed to a different person, who in his opinion may also have drawn some of the figures on the inside of the right-hand wing. See Chapuis 2004 (as note 11), p. 130.

<sup>65</sup> A very similar underdrawing on the Nuremberg panel to that of the broad-lined underdrawings on the central panel of the 'Altarpiece of the City Patron Saints' is described and illustrated by Faries (as note 6), p. 172, p. 174, fig. 9; Chapuis 2004 (as note 11), pp. 169–171, presumes that two hands ('master and assistant') were involved in the execution of the underdrawing of the Nuremberg panel, although provisional results of current investigations in Nuremberg suggest Stefan Lochner as exclusively responsible for the underdrawings (written communication from Katja von Baum on 11 July 2014).

<sup>66</sup> On this by no means surprising observation, see *Let the Material Talk* (as note 2), pp. 188, 192, 197–199 and, on regulations concerning the type and number of assistants in Cologne painters' workshops of the time, Iris Schaefer, 'Zunftordnung und Werkstattpraxis Kölner Maler des Spätmittelalters', in *Genie ohne Namen*, ed. by Rainer Budde and Roland Krischel, exhib. cat. Cologne 2001, 117–137.

<sup>67</sup> See most recently Chapuis 2004 (as note 11), p. 59.

<sup>68</sup> *Let the Material Talk* (as note 2), pp. 26–27.

displays striking similarities with the image of St Gereon on the outside of the right-hand wing of the triptych in Bamberg. Surprisingly, a stag beetle is also depicted on the Bamberg panel, which unfortunately, owing to the poor state of preservation of this work has not been more closely inspected and assessed. If, as we assume, this beetle is not a later addition, Lochner will have been at least familiar not only with the form taken by the figure of St Gereon, but also with his depiction in combination with the illustration of a stag beetle. He may even have been in possession of the corresponding drawings.<sup>69</sup>

A final aspect is concerned with possible real portraits, which may be present not only in the underdrawings of individual faces on the St Ursula and St Gereon panels, but also in the paintings. Conspicuous in this connexion is the male figure with a hat depicted on the left of the Virgin's throne in the background of the central panel (fig. 41). We can see on the grey surface of the hat two signs in illusory relief. At first sight, both appear to resemble the letter 'S', but in fact only the one on the left is an 'S', while the other in all probability is a 'Y'.<sup>70</sup> The first of these letters immediately suggests a possible association with Lochner's forename Stefan, and thus possibly a hidden signature, which however, in view of the second letter, seems at first not very plausible. How, though, should we interpret the 'senile warts' which are a further distinctive feature of the depicted person? According to Tobias Burg, there are a number of factors speaking against a self-portrayal of the artist as an ancillary figure: the compositional coherence of the figure (as a counterpart to the figure of the young Magus on the right), the absence of any inscription which could be unambiguously decrypted or interpreted as a signature, the absence at that time of any tradition in the German-speaking area of any such pictorial tradition, and finally the fact that the figure is not looking out of the picture, a sign which may not be conclusive, but is seen as probable.<sup>71</sup> On the other hand Burg also points to the fact that the figure in question stands out clearly from the other faces. In view of the comparatively non-schematized, and, with the warts, additionally individualized face, and finally also in view of the unique letters on the hat (which contemporaries may have known how to interpret), he thinks it possible that a real person of the time was being depicted. Interestingly, Burg thinks the figure in question fits even less well into the tradition of donor portraits (which would be conceivable in principle), however, than into the context of self-portraits as ancillary figures. Consequently, we cannot entirely dismiss the appealing thought of a possible self-portrait of Stefan Lochner on the central panel of the 'Altarpiece of the City Patron Saints'. Future scholars may succeed in solving this puzzle. In any case, in view of many other detailed observations which we have been unable to discuss in the present article, we might imagine that the new

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<sup>69</sup> On the latest considerations regarding the relationship between Stefan Lochner and the Master of the Heisterbach Altarpiece, see *Let the Material Talk* (as note 2), pp. 188–190.

<sup>70</sup> This valuable information was provided by Clemens M. M. Bayer.

<sup>71</sup> According to Tobias Burg, the earliest example of a self-portrait of a painter in Germany was Hermen Rode (1484). See Tobias Burg, *Die Signatur. Formen und Funktionen vom Mittelalter bis zum 17. Jahrhundert*, Münster 2007, p. 501.

stock of revealed underdrawings and high-resolution colour illustrations of the painting will encourage further studies, not least with respect to further links between the 'Altarpiece of the City Patron Saints' and the 'Ghent Altarpiece' of the van Eyck brothers.

### Thanks

Together with the present authors, the photographer Michael Albers, and the conservators Theresa Neuhoff and Katja von Baum prepared the infrared photographs of the 'Altarpiece of the City Patron Saints', and carried them out over the course of 17 hours. We should like to thank them all for their outstanding co-operation, and Michael Albers in particular for the technical preparations as well as for the subsequent digital montage of all the individual images. For permission to take the photographs in the first place, and for support in all sorts of other ways, we should also like to express our thanks to Barbara Schock-Werner, Michael Hauck, the Cathedral Chapter, Roland Krischel, Marc Peez and most particularly Klaus Hardering. To a large degree we owe the laborious preparation of the new high-resolution colour photographs to the two photographers Mira Unkelbach and Jenny Rumbach.

For expert advice with respect to the identification of the drawing instruments we are very grateful to Thomas Klinke, Thomas Ketelsen, Uwe Westfeling and in particular Andreas Siejek, recognized experts in the field. It was not least thanks to the latter's assessment that we succeeded in identifying the quill as the drawing instrument on three panels of the 'Altarpiece of the City Patron Saints'.

We received particular specialist assistance also from Clemens M. M. Bayer in the identification of the written characters, from Tobias Burg in the question of the possible self-portrayal of Stefan Lochner and from Norbert Nussbaum in the interpretation of the tracery forms of the prie-dieu in the context of Gothic architectural geometry. Rolf Sutter, a highly regarded expert in heraldry, provided important information on St Ursula's banner, and also provided us with illustrative material. We are extremely grateful to all of them for their valuable and detailed opinions.

We are also particularly grateful to our colleagues and co-authors of the volume summarizing the results of our joint research project 'Let the Material Talk – Technology of Late-medieval Cologne Painting': Katja von Baum, Patrick Dietemann, Ulrike Fischer, Roland Krischel, Theresa Neuhoff, Martin Schawe, Heike Stege and Jeanine Walcher. Of these, Janine Walcher, Katja von Baum and Ulrike Fischer were particularly concerned with investigating Stefan Lochner's underdrawings.

Finally we should like to thank Rolf Lauer for the expert exchange of views and for reading through the manuscript of this article. We owe it ultimately to him and to Klaus Hardering and the Zentral-Dombau-Verein that the dedicated website for the online presentation of the infrared reflectograms of the 'Altarpiece of the City Patron

Saints was made possible, and realized to the highest professional standards by Redaktionsbüro Dank.

Captions of the illustrations:

1a. Stefan Lochner, 'Altarpiece of the City Patron Saints', c. 1442. Cologne, cathedral, Marienkapelle.

1b. Stefan Lochner, 'Altarpiece of the City Patron Saints', c. 1442. Cologne, cathedral, Marienkapelle.

2. Right-hand wing, outside, detail of the Archangel Gabriel. The IR reflectograms (right) made with the digital camera system 'Osiris' provided an abundance of new information concerning the underdrawing compared with the infrared photographs of 1985/86 (left).

3. Total view of the outsides and insides, IR reflectogram with mapping of the various underdrawings, which stylistic and technical differences reveal to have been carried out by at least four people. In the yellow-mapped areas, the familiar graphic vocabulary of Stefan Lochner is apparent.

4. Outside of left-hand wing, Virgin Mary, IR reflectogram.

5. Outside of right-hand wing, Archangel Gabriel, IR reflectogram.

6. Outsides of wings, three details of the ceiling (left), the Virgin's hair (centre) and the angel's wings (right) in the IR reflectogram. The three details exhibit characteristic features of a pen drawing (quill), including blunt starts and finishes to the lines, lines spreading out as they proceed, increased deposits of the drawing medium at the point where the pen was put on to the panel, and typical changes in the breadth of the stroke when the pen changes direction.

7. Outside of left-hand wing, detail of the curtain in the background, decorated with the *pressbrokat* technique, IR reflectogram. Beneath the curtain, underdrawings are visible that seem to continue the brocade pattern and thus suggest an all-over underdrawing of the patterns and folds of the brocade curtain.

8. Inside of left-hand wing, St Ursula, IR reflectogram.

9. Inside of left-hand wing, detail of the companions of St Ursula, IR reflectogram.

10. Inside of left-hand wing, detail of the pope's head, IR reflectogram with detailed and individual-looking underdrawing.
11. Inside of left-hand wing, detail of the hand at the right-hand edge of the picture in the IR reflectogram (left and centre) and incident light (right). While the two drawn hands of the underdrawing seem to grasp the upper arm of St Aetherius from behind, in the painted version it turns out to be the hand of St Aetherius himself.
12. Central panel, detail of the kneeling magus in the left half of the panel, IR reflectogram. The very detailed underdrawing exhibits characteristic features of Stefan Lochner's drawing style.
13. Central panel, detail of the Virgin's garment, IR reflectogram. The light and shade in the folds is characterized by the cross-hatching typical of Lochner.
14. Central panel, details of the heads of male figures at the left edge of the picture (left) and the right edge of the picture (right) in the IR reflectogram. The broad lines indicating the hairstyle and turban of the head on the right differ from the loose underdrawing of the head on the left, which still exhibits the typical features of Lochner's drawing style.
15. Central panel, detail of one of the angels in the background, IR reflectogram. The broad lines are also used for small-format motifs.
16. Central panel, detail of the Virgin's garment, IR reflectogram. The cloth had already been laid-in in paint before it was corrected, probably with pen strokes.
17. Central panel, detail of the male figure to the left of the Virgin's throne, IR reflectogram. In the collar we can see a mark, resembling a laterally reversed '4', which indicates the colour to be used.
18. Inside of right-hand wing, detail of the figure of St Gereon, IR reflectogram. An underdrawing using vigorous and loosely executed lines is visible.
19. Inside of right-hand wing, detail of St Gereon's cloak, IR reflectogram. The often blunt, or even split starts to the strokes, the fact that the strokes are often short, and the rhythmic alternation of thin and thick lines in the zigzag hatching bear witness to the use of a thick quill.
20. Inside of right-hand wing, details of the heads of the male figure at the left-hand edge (left) and of St Gereon (right) in the IR reflectogram. The head on the left is drawn very sketchily with just a few strokes. In the face of St Gereon, broad lines in the area of the eyebrows and eyes change the attitude of the head, originally inclined to the left, with a finely drawn oblique position of the eyes and nose.

21. Inside of right-hand wing, details of heads of two companions to the right of St Gereon in the IR reflectogram. The detailed, presumably two-stage underdrawing of the head on the left could be an attempt to capture an individual physiognomy, and differs from the striking and sketchy facial features of the right-hand head with an originally planned helmet (sallet).

22. Inside of right-hand wing, details of the leg armour of St Gereon in the IR reflectogram (left and centre) and in incident light (right). In a presumed second underdrawing stage (centre), the edges of the articulated plates or lames (left), originally planned as angular, were corrected to round forms more like those in the painted version (right).

23. Total view of the outsides and insides, IR reflectogram with mapping of all areas in which disparities between the underdrawing and painting can be ascertained.

24. Outside of left-hand wing, the Virgin in the IR reflectogram (left) and in incident light (right). In contrast to the Virgin in the underdrawing, sketched with an elaborate headdress and loose wavy hair (left), the painted version comes across as simpler and plainer (right). The planned decorative clasp of her cloak, originally fastened, was also omitted.

25. Outside of left-hand wing, prie-dieu in the IR reflectogram (left and centre) and in incident light (right). In the underdrawing the prie-dieu was generally broader and higher (left) than in the painting. The curtain envisaged here on the front, as well as the tracery rose on the side were never realized in the painted version. Instead, the latter had a not very successful tracery, consisting of a rose, trefoils and lancets (centre), which in its turn was replaced by the final design of intersecting ogee arches (right).

26. Outside of right-hand wing, detail of the Archangel Gabriel in the IR reflectogram (top) and in incident light (bottom). Between the underdrawing (top) and the painting (bottom), changes can be discerned in the shape of the scroll and the clasp of the cloak, for which originally only a clover-leaf pattern was envisaged, but which in the painted version is decorated by the figure of God the Father.

27. Inside of left-hand wing, detail of the hands of St Ursula in the IR reflectogram (top) and in incident light (bottom). While the underdrawing envisages her hand in a loosely hanging posture, the painted version raises it to clasp with the left hand.

28. Inside of left-hand wing, detail of the companions of St Ursula and of St Aetherius in the IR reflectogram (top) and incident light (bottom). The underdrawing envisaged, for many heads, a more extensive and elaborate headdress with wreaths of petals, headbands, bonnets and diadems. While the headdress of many female

companions was reduced in the final painted version, a wreath of leaves was actually added to the head of St Aetherius.

29. Inside of left-hand wing, detail of the banner in the IR reflectogram (left) and in incident light (right). The ten and eleven stylized ermine tails in the drawing give way in the painting to an inconspicuous naturalistic design of the fur. The 'passant guardant' lions in the other quarters were each given a crown in the painted version.

30. Arms of Brittany (left) and England (right), details from: Richental-Chronik, St. Georgen 63, fol. 134v und 67r. Karlsruhe, Badische Landesbibliothek.

31. Central panel, detail of the male figure on the left-hand edge of the picture in the IR reflectogram (left) and in incident light (right). The sword, completely visible in the underdrawing, is partly concealed by the leg in the painting.

32. Central panel, detail of the male figure on the right-hand edge of the picture in the IR reflectogram (left) and in incident light (right). While in the underdrawing his left hand grasps the pole of the banner, the painting shows his right hand doing this.

33. Inside of right-hand wing, detail of St Gereon's brigandine in the IR reflectogram (left) and in incident light (right). The forms of the brigandine envisaged in the drawing with a chain running diagonally across the torso differ conspicuously from the very costly garment depicted in the painting.

34. Inside of right-hand wing, of the warrior with a pole weapon in the IR reflectogram (left) and in incident light (right). In contrast to the drawing of the warrior with his striking, somewhat grim features and a helmet pulled down well over his brow, the painting shows the friendly countenance of a young man with flowers in his hair. The battle-axe envisaged in the underdrawing has given way in the painted version to a less dangerous war hammer.

35. Inside of right-hand wing, detail of the companion on the left-hand edge of the picture in the IR reflectogram (left) and in incident light (right). While the underdrawing and possible a first lay-in in paint envisages the hand resting on a piece of armour, in the painting it grasps the hilt of a sword, which was presumably only added during the painting process.

36. Inside of right-hand wing, detail of the companion on the left-hand edge of the picture in the IR reflectogram (left) and in incident light (right). The mapping shows a total of six feet, some of them already laid-in in colour, whose assignment to particular bodies is unclear.

37. Inside of right-hand wing, IR reflectogram, detail of the left bottom corner, where an arc-shaped line from the bottom left of the panel reaches to the point of the foot of St Gereon.

38. Central panel, detail of the flag with the moor in the IR reflectogram (left) and in incident light (right). While the underdrawing envisaged a slightly turned figure with a head shown in profile looking left, two bent raised arms, and a lance with a pennant, the painting depicts a moor seen frontally, fashionably dressed in a short garment, with hat and boots.

39. Depictions of moors in attributed arms of the Magi. Left: detail from the 'Codex Gelre', 1370-1386, Ms. 1565L-56, fol. 28v. Royal Library of Belgium, Brussels. Right: detail from the 'Richental-Chronik', St. Georgen 63, fol. 70r. Karlsruhe, Badische Landesbibliothek.

40. Master of the Heisterbach Altarpiece and Stefan Lochner, Christ on the Cross with the Virgin and the Twelve Apostles, 1430s, Bamberg, Bayerische Staatsgemäldesammlungen, Staatsgalerie in der Neuen Residenz. Right: outside of left-hand wing with St Gereon, inv. no. 505. Left: detail, stag beetle.

41. Central panel, detail, head of the male figure to the left of the Virgin's throne. The characters on the grey surface of the hat and the painted senile warts in the face could indicate the portrait of a real contemporary.