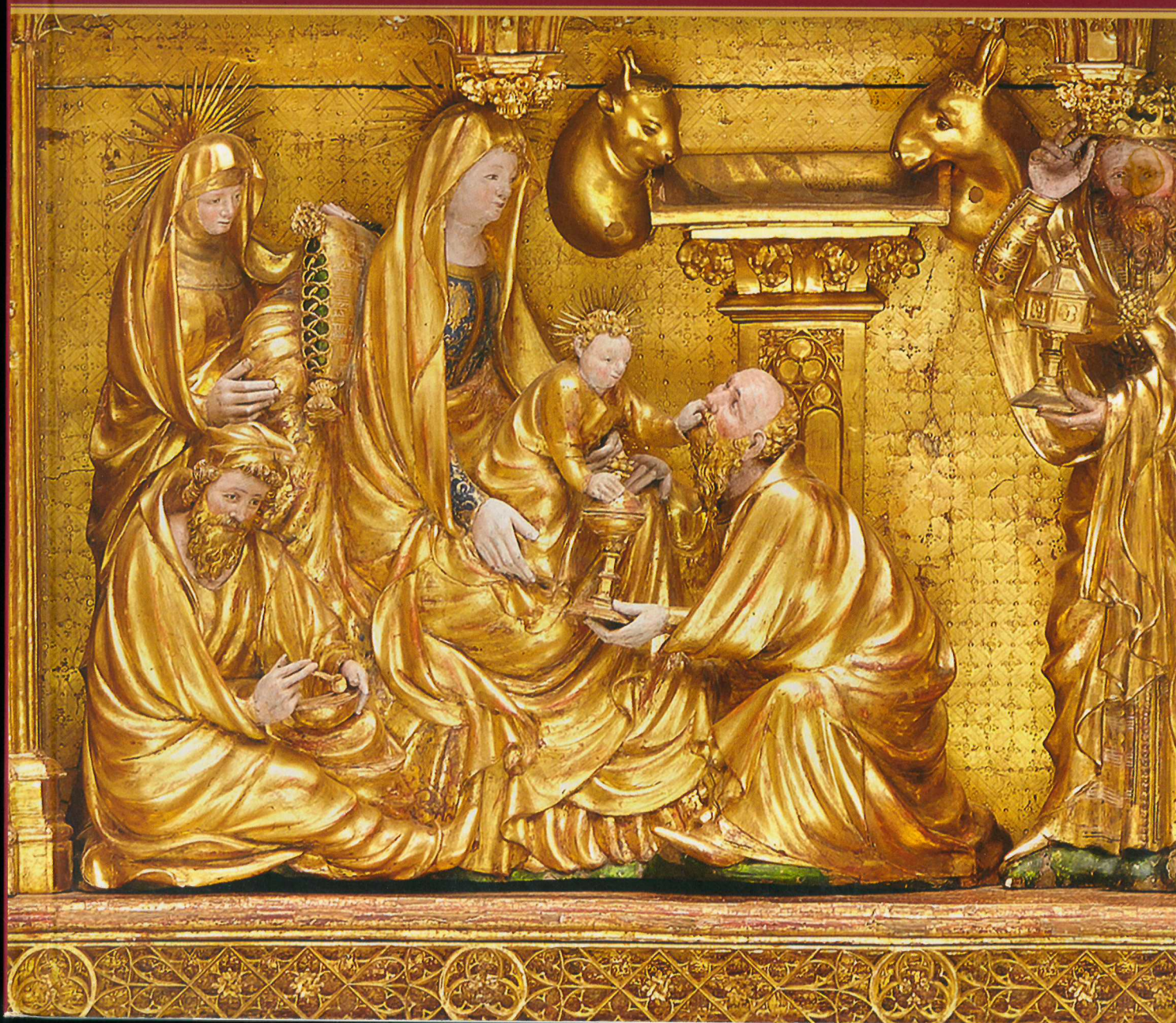


THE RETABLES  
OF THE CHARTERHOUSE OF CHAMPMO

snoeck





# A masterpiece revealed: Melchior Broederlam's painted wings for the *Crucifixion Retable*<sup>1</sup>

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Melchior Broederlam's painted wings for Jacques de Baerze's sculpted *Crucifixion Retable* are the earliest known dated examples of pre-Eyckian panel painting. Their significance cannot be overstated, not only for their historical value – several extant source documents describe their commission and early history – but for their extraordinary achievement as works of art.

The panels, depicting the Annunciation and Visitation scenes to the left and the Presentation of Jesus at the Temple and Flight into Egypt to the right, present a rich and nuanced display of narrative, colour and texture. They form the reverse sides of the *Crucifixion Retable*, and are thus only viewed together when the altarpiece is closed. The retable in its open position displays De Baerze's delicately carved sculptures and tracery, comprising the Crucifixion, Adoration of the Magi and Entombment in the central panel, and five carved statuettes of saints and martyrs in each wing. Gilded and polychromed by Broederlam, they form a harmonious ensemble with the painted wings.

Since the mid-nineteenth century, the *Crucifixion Retable* has attracted regular commentary from scholars and connoisseurs

alike.<sup>2</sup> Chrétien Dehaisnes (1886), Cyprien Monget (1898) and Bernard Prost (1902–13) were the first to publish transcriptions of contemporary documents relating to the commission.<sup>3</sup> As part of his 1976 doctoral study Patrick De Winter explored the circumstances of the commission and significance of the retable.<sup>4</sup> In 1986, Micheline Comblen-Sonkes provided a summary of the diverse opinions on the iconographic and stylistic sources for the retable.<sup>5</sup> She also published the results of the first technical examination, including remarks relating to the underdrawing and an analysis of techniques and materials by Leopold Kockaert.<sup>6</sup> Renate Prochno's recent monograph on the Charterhouse of Champmol details the artistic projects for the foundation and includes new transcriptions of the archival documents.<sup>7</sup>

Fig. 1a - Infrared reflectogram assembly (IRR), left wing: ruled construction lines and underdrawn outlines annotated in red, assumed continuations of these markings in pink.





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Improvements in infrared reflectography and digital photography facilitated a new consideration of the artistic techniques in Broederlam's painted wings from the initial design stage through to the final painted image.<sup>8</sup>

### PREPARATION OF THE PANELS

Broederlam's wooden shutters were made ready for painting using techniques and materials typical of fifteenth- and sixteenth-century Flemish painting. Each wing comprises five horizontal planks, with two shorter sections for the upper rectangles and triangles.<sup>9</sup> The wood is oak and the planks are approximately one cm thick.<sup>10</sup> The joins between the boards were most probably glued together, with or without dowels within the thickness of the planks.<sup>11</sup> The frames would have been made around the same time as they are linked to the panels by a linen interleaf (see below) and are similarly prepared and gilded. The newly joined panels were most likely planed or scraped down in some way to ensure as flat a surface as possible. This was standard practice during the period.

A plain weave linen canvas was glued directly onto the surface of the panels, extending onto the frames.<sup>12</sup> Prior to the triptych's current restoration, woven fibres were visible in losses along joins and cracks and at the edges of the panels where the fabric and ground layers had ruptured. However, the absence of open losses in the flat parts of the frames makes it impossible to assess whether or not the canvas is also present in these areas. The linen canvas would have hidden the wooden pegs attaching the wooden tracery on the other sides of the panels, smoothed out any remaining irregularities in the wood, helped adhesion of the ground and provided some physical continuity with the frames.<sup>13</sup>

Like Theophilus<sup>14</sup> before him, Cennino Cennini (late 1390s) also recommends the application of linen cloth to panels prior to the application of the ground and paint layers, but says the cloth should be old and thin.<sup>15</sup> He advises sizing the wood panel first with several coats of glue made from clippings of sheep parchment, dipping pieces of linen in the best glue size, and then spreading on the cloth by hand onto the panel surface.<sup>16</sup> His advice is borne out by practice; most Italian paintings in the fourteenth century have a canvas interleaf between panel and ground.

The paucity of surviving works makes it impossible to assess whether a textile interleaf was indeed widespread in the North around 1400, although occasional cases have been observed.<sup>17</sup> It is, however, common to find paintings where small pieces of cloth have been used to reinforce joins or cover defects prior to priming.<sup>18</sup> In this region, the use of oak – a stable wood with few natural defects – would make a cloth lining less necessary than in Italian trecento painting, where the more reactive wood, poplar, was the preferred support.<sup>19</sup>

A chalk ground layer, leanly bound in animal glue, was applied over the linen canvas and frame, probably in several layers.<sup>20</sup> Its thickness, estimated at between 1–2 mm,<sup>21</sup> completely masks the canvas texture. A chalk-glue ground layer is typical in Flemish, and indeed most Northern panel painting from the late fourteenth to the early part of the seventeenth century, unlike Italian painting of the same period, where gesso (calcium sulphate) was the norm. The brushes used to apply the white ground were likely made from hog hair, as was recommended by Cennino Cennini.<sup>22</sup>

Once dry, the ground layer would have been smoothed down to ensure an even surface for drawing and painting. Theophilus mentions the plant "uocatur asperella" in this context, most likely identifiable with horsetail (*Equisetum arvenis*), a common vascular plant whose stems contain silica.<sup>23</sup>

The third book of Eraclius, *De coloribus et artibus romanorum* (thirteenth century) also advises the use of this naturally abrasive plant for rubbing down wood prior to applying paint.<sup>24</sup> Alternative abrasives might have been cuttlefish or sharkskin.<sup>25</sup> Cennini suggested a metal scraper for this purpose that he referred to as a "raffietto", followed by the use of a spatula with a straight edge.<sup>26</sup>

Broederlam would have had one or more apprentices and assistants for the routine preparation of panel supports, making brushes, preparing and applying grounds, grinding pigments and mixing paints.<sup>27</sup> He may also have had assistance with painting and gilding on occasion.

Concerning Broederlam's work for Champmol, the first mention of assistants is on 18 February 1394, when Philippe the Bold paid a gratuity to his valets for their contribution to an altarpiece for the Charterhouse church.<sup>28</sup> At some point during 1393–94, Hues de Boulogne was sent as an apprentice to Broederlam in Ypres with the duke's financial support.<sup>29</sup> Broederlam presumably knew of the boy; his father, Laurens de Boulogne, had worked at the Château of Hesdin for many

Fig. 1b - IRR, right wing: as in 1a.



years.<sup>30</sup> On 12 September 1399, the accounts record that “Melcior vacqua avec plusieurs aut[re]s dudit mestier longue espace de temps”.<sup>31</sup>

### THE UNDERDRAWING

While Broederlam almost certainly delegated the making of the panel and application of the canvas and ground layer to assistants, the underdrawing stage was most likely his own personal responsibility. This assumption is based on an analysis of the underdrawing, which reveals deft and often bold handling in a range of drawing materials and techniques, as well as presenting subtle modifications during execution.

#### From construction lines to outlines: laying in the architectural framework

##### Markings

It is probable that the first markings Broederlam made on the smooth white ground were those situating architectural structures. The artist progressed through this stage in two phases. First, he ruled on a series of diagonal, vertical and horizontal construction lines for the architectural framework (figs. 1a–b).<sup>32</sup> These often cross the figures and sculptural motifs, which were drawn in later. The positions of vaults, columns and capitals are indicated, the lines frequently overshooting the actual motifs (fig. 2). In the Presentation in the Temple the most important guides are the vertical “plumb” lines for the temple structure: a central line running from the very top of the temple to the bottom of the stone steps marking the exact vertical centre of the frontal arch,

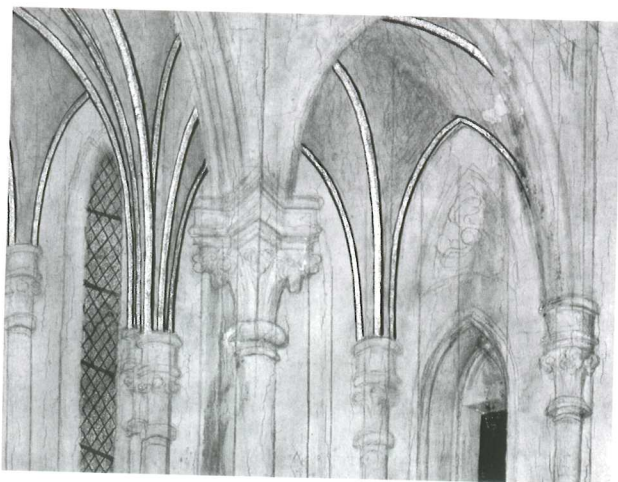


Fig. 2 - IRR: Presentation, temple vaults and columns.

lines delineating the shafts of the main columns, and a line marking the outer right edge of the building extending down into the grassy foreground (to the left, the frame occupies the place where a line would have been). In the Annunciation, initial markings include ruled horizontal lines locating the upper and lower extent of the rose trellis in the interior courtyard garden – the upper edge appearing lower down in the final paint layer – and vertical and horizontal “grid” lines for the mullioned windows surmounted by pinnacles, overlooking the entablature of the tiled passageway. In more than one place, the artist’s rush to establish the basic construction led to several sets of lines for the same outline and inadvertent slipping of the drawing instrument (figs. 2 and 4). With the same drawing tool and at around the same time, Broederlam indicated rough double circles in the entablature of the Presentation scene (fig. 4).

For the second phase, Broederlam continued to mark in the architectural elements, adjusting some and adding further detail. Like the first stage – and sometimes indistinguishable from it – he executed straight lines with the aid of a ruler, but any curved outlines and details of architectural mouldings were carried out freehand. For the ribs of the dome, he employed his wrist as a pivot rather than resorting to any mechanical aids; curved lines result from several sweeps of the drawing tool, sometimes gone over more than once (fig. 3). In the Presentation in the Temple, the artist replaced the double circles in the entablature with a carved, inset frieze depicting an undulating oak foliage pattern contained within rectangles (fig. 4). Broederlam also added a triangular insert with a carved leaf pattern to the wall arch at the right of the temple interior (fig. 2), later dropped during painting. In the Annunciation, he reduced the width of the cornice of the covered passageway to prevent it from touching a decorative curved window head to the left. Finally, the artist marked areas of deep shade with scribbled or hatched lines.

Where architectural structures are profiled against areas of gilding, the artist passed over the drawing lines with a sharp stylus or needle (see below, “Marking out the areas to be gilded”).

##### Drawing materials

The soft, dark grey construction lines for placing the architectural structures are in a dry medium. The lines have an even density and width, taper slightly at the ends of strokes and never culminate in a droplet. Rather than conforming to the surface texture, as would be expected from a liquid medium, markings skip the low points. Close inspection reveals minute clumps of drawing material of random size and



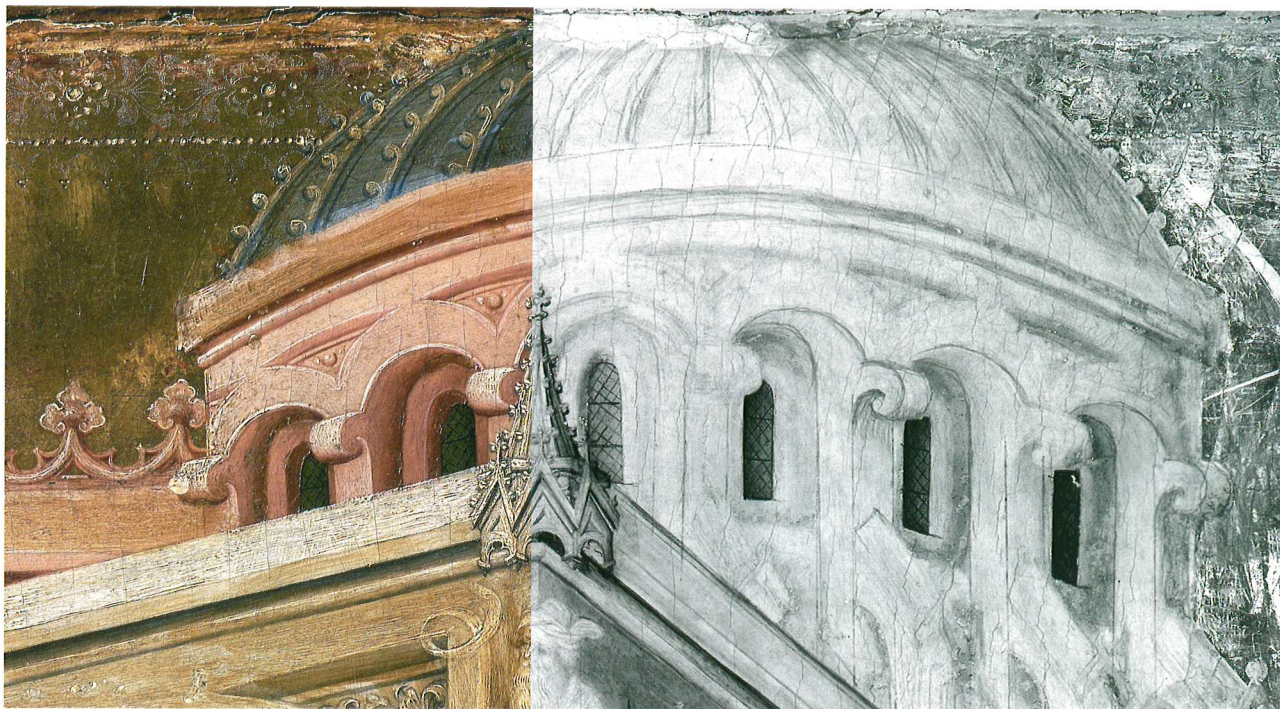


Fig. 3 - IRR and normal light: Annunciation, dome.

shape. These observations suggest the use of a metal stylus.<sup>33</sup> Scientific analysis of the drawing lines would be needed for confirmation.

In the entablature of the temple in the Presentation, the modifications to the initial layout were also made in a dry, grey-black drawing medium. The markings are finer and slightly more absorbent of infrared than the first drawing lines.<sup>34</sup> (fig. 4). This could suggest a carbon-based drawing medium such as black chalk, but a fine metalpoint is also possible. Broederlam could have mounted a small block of black chalk in a wooden or metal holder, and sharpened it for use. The freehand lines are clearly executed in a dry medium, although both metalpoint and black chalk remain possibilities. Again, analysis would be required to resolve the question.

#### Perspective

The perspective of Broederlam's two architectural scenes, although not based on any mathematically coherent system such as one-point perspective, was carefully planned to

enhance the meaning of the narratives.<sup>35</sup> In the Presentation in the Temple, the perspective framework of the temple focuses attention on Jesus. The vertical plumb line dissects the child's head and orthogonals from the receding floor tiles tend to converge at the junction between Mary and Jesus's hands. The orthogonals leading out from the upper and lower sides of the structure, if joined and a horizontal line drawn between them, also dissect Jesus's head. In the Annunciation, the receding orthogonals of the tempietto, when similarly joined, draw the eye towards Mary's hand gesture and book.

Broederlam's manner of articulating space and volume is similar to that in earlier Italian trecento painting, such as Ambrogio Lorenzetti's *Presentation at the Temple*, 1342 (Galleria degli Uffizi, Florence).<sup>36</sup> His mannered and somewhat artificial architectural settings can also be compared with that in *The Appearance of Christ to St Martial* by Matteo Giovannetti in the Papal Palace at Avignon, painted around 1344–45. The artist made use of a similar hexagonal perspective construction. As with Lorenzetti, Broederlam's use of receding orthogonals in the architecture and tiled floors







helps establish a credible setting for two of the four narrative scenes. The angled structures also echo to some extent the triangular sections of the panel supports, linking the paintings' compositions to the unusual shape of the retable.<sup>37</sup> The source or sources of Broederlam's early renderings of perspective are unknown. The temple may have been inspired by the strikingly similar motif in the great Apocalypse tapestry series in Angers castle in Anjou, designed around 1375 by Jan Baudolf from Bruges (for which Baudolf was paid in 1378).<sup>38</sup> For the architecture as a whole, he may have been aware of the style through unrecorded travels to Italy or elsewhere, from manuscripts or from the record drawings of fellow artists. Jacques de Baerze's first advance payment receipt states that the *Crucifixion Retable* should be a replica of an already-existing altarpiece. However, this instruction may well have only applied to the overall conception of the altarpiece and its subject matter, leaving Broederlam the freedom to compose the paintings for the wings as he saw fit.

#### Drawing in the figures

It is likely that the figure groups were drawn in soon after the architectural framework and prior to the landscape background. The buildings would have provided the "stage set" in and around which the characters could be advantageously positioned, and the landscape would have been drawn around later as a backdrop.

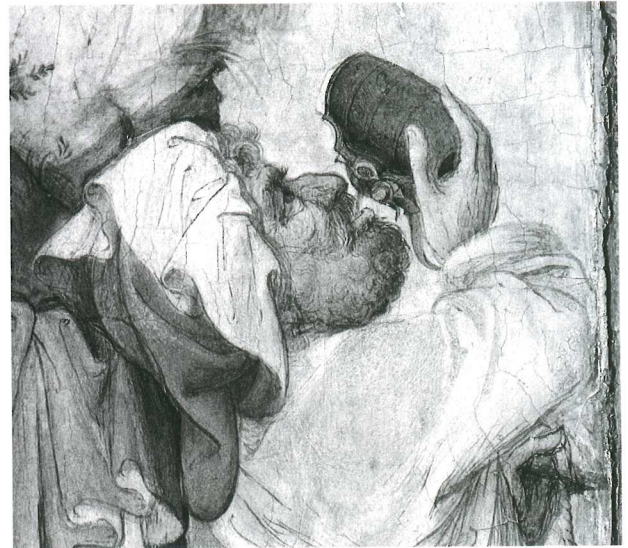


Fig. 5a - IRR: Flight into Egypt, Joseph.

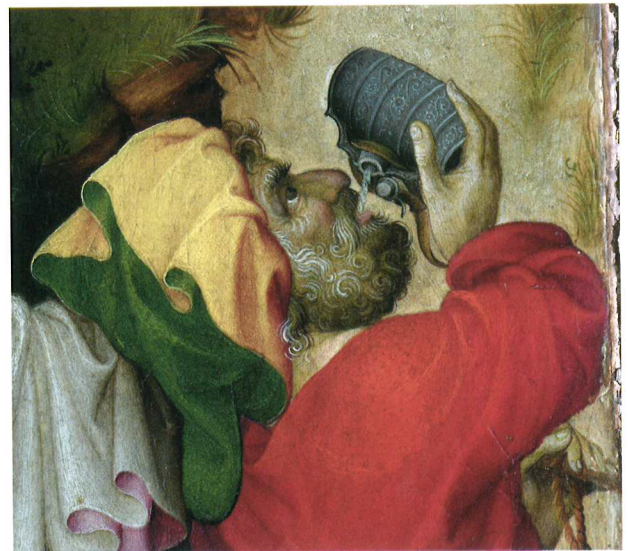


Fig. 5b - Flight into Egypt, Joseph.

#### Markings

Broederlam drew the figures in a liquid medium applied with a brush, indicating principal outlines and carefully mapping out drapery folds and zones of light and shade (fig. 5a). He varied the level of detail according to the importance of a motif and its position in the composition; the decorative floating angels in the upper left and right are, for example, less detailed than the main characters.

Fig. 4 - Digital infrared photograph assembly: Presentation. Two phases in underdrawing: initial markings, registering as common and pale (e.g. double circles, horizontal ruled lines) and later corrections, appearing finer and darker (e.g. undulating frieze pattern, horizontal ruled lines).





Fig. 6a - IRR: Presentation at the Temple, Simeon.



Fig. 6b - Presentation at the Temple, Simeon.

In the figures, outlines are lively, accurate and sensitive to small detail. Joseph's boots provide an example of the artist's deft liquid drawing style: outlines are confident, loose but precise and the ends of fold lines curl into small hooks to mark the innermost points. Strokes sometimes culminate in a droplet and show variations in tone and width, as in the white shawl draped over St Anne's shoulder in the Visitation.

Contours and shadows were generally modelled in finer, more regular strokes, an example given by the sets of long lines for vertical drops in draperies. Shadows in the latter are sometimes indicated with diagonal hatching strokes. The artist cross-hatched complex folds, curving the strokes in the direction of contours. In Simeon's velum for instance, there is three-way cross-hatching on the insides of folds, now faintly



discernible through the white paint. It is unlikely however, that Broederlam originally intended these hatching marks to play a part in the final appearance of the painting, as the paint layer subtly transitions from pure white through to dark grey and does not require additional modelling.

In certain faces, Broederlam reveals an ability to capture individual traits specific to different characters, particularly in the more boldly drawn male figures. The anecdote of the old man drinking in the Flight into Egypt catches the eye. Joseph exemplifies the rugged, sun-weathered traveller of humble origins with a hooked nose and protruding lower lip; these features were somewhat smoothed away at the paint stage to give a more stylized profile (figs. 5a–b). Experimenting with physiognomic expressions and at the same time supplying some psychological identity is not new in the art of around 1400. Joseph's external features come close to the personification of Luna, a planet reduced to human proportions as a most expressive caricature-like vagabond in the *Liber astrologiae* by Georgius Zothori Zapari Fenduli (Ms. M. 785, fol. 50v, Pierpont Morgan Library, New York), an astrological treatise written in Bruges around 1403.

Simeon's underdrawn face on the other hand, suggests a reflective and learned personality, with its delicate hatching and cross-hatching in the eye cavity and perfectly regular undulating lines for the beard (figs. 6a–b). The well-established type of the Bearded Prophet has become here an individual, with specific physiognomic features. He is characterized as a contemplative being. Simeon seems to have acquired the uniquely human capacity to experience an inner life. Broederlam has made his appearance more down-to-earth and emotional than previous characterizations, and above all, more true to life.

Women are generally drawn with less vigour than their male counterparts. St Anne's face has broad, short strokes marking the main features, finer, longer outlines for the overall shape and closely applied strokes in shadows. The underdrawing of the Virgin's face is altogether simpler, more decorous and formulaic than that of the other characters, and modelling cannot be distinguished.

With the Angel Gabriel of the Annunciation Broederlam created a new type with a striking, unpolished physiognomy. It was perhaps imitated some twenty years later in the angel of the Walcourt panels (Musée Provincial des Arts Anciens du Namurois, Namur), again in a highly simplified and stylized form. The Walcourt panels were a local production, and they were probably also influenced by a more traditional style and

execution, as exemplified in some of the angels in the Angers Apocalypse Tapestries. Broederlam's motif of a round fleshy face and waving locks of curly hair can be found again in the angels in four fragments of the stained glass windows (Bruggemuseum-Gruuthuse, Bruges) made for the front of the Bruges's town hall and attributed to Christiaen van de Voorde (c. 1385–1404).

Broederlam's gallery of figures comes close to the high level of individuality in Jacques Daliwe's study of heads, a drawing in the so-called *Liber Picturatus*, a sketch or model book from c. 1400–20. The study is a collection of human types, most probably based on existing models and designs, but infused with highly realistic, sketch-like characteristics observed from life.

Features such as hands are often indicated cursorily in both drawing and paint layer; elegance and smoothness were clearly valued above anatomical correctness, conforming to prevailing courtly style.

#### Materials

Close examination of a small loss from the ring finger of the Virgin's left hand in the Visitation shows that liquid, reddish-brown strokes applied directly on the ground layer correspond precisely with the underdrawing as revealed in infrared (fig. 7). This observation is supported by Kockaert's analysis of a cross-section from the same area, which tentatively identifies the underdrawing as a mixture of carbon black and red ochre and applied directly above the chalk ground.<sup>39</sup>

To investigate whether all the liquid underdrawing in the figures could be a warm brown hue rather than black, open losses in the paint layer were scrutinized. In St Anne's white headdress a painted brown line was discerned on the ground layer, clearly part of the liquid underdrawing; similar observations were made in the middle finger of her left hand and face. In the face, there is a broadly applied reddish-brown underlayer – probably the underdrawing – between the eyes.

In the angel Gabriel, the transparent orange paint of the hair curls – invisible in infrared – are underlain by dark, infrared absorbing strokes; in this area though, the colour of the underlying strokes cannot be ascertained as reddish material in losses could also represent later retouching for the hair. Nonetheless, in Gabriel's right hand, two small losses reveal reddish-brown strokes consistent with the underdrawing as seen in infrared.



In the Presentation, there is a small paint loss in the beard of the male attendant behind Mary; here, reddish-brown brushstrokes correspond to underdrawing lines for the beard. The artist also appears to have applied broader strokes to establish areas of dark tone, both under the proper right eye and for the eyelids.

In Joseph's face, the thickness of the paint prevents any speculation as to the colour of the brush underdrawing, which takes on a faint greyish appearance through the paint; however, the underdrawing of his boots – also perceived as greyish in normal light – is clearly reddish-brown when observed in a paint loss.

A dilute, reddish-brown paint therefore appears to be Broederlam's preferred medium for marking in outlines and areas of shadow tone in faces, draperies and accessories. During painting, he employed the same hue for outlines and shadows, combining it with a darker brown in hands and faces.

The medium of the brush drawing could not be analysed, but is most likely water or glue, perhaps mixed with a local gum to improve its wetting properties.

Broederlam would have most likely delegated to assistants the task of making a range of medium to very fine brushes suitable for both laying in the design and painting. The fine strokes of the underdrawing, often tapering to a point, suggest a soft but flexible pointed brush, most likely made from the tail of a small animal such as a squirrel, marten, ermine or sable. Cennini advocates making brushes from the fur of a "vaio" [vair], emphasizing that only their tails were suitable for the purpose. A "vair" was a type of squirrel, probably today's Siberian squirrel; the word also refers to its fur, prized in the Middle Ages for trims and linings of cloaks. For brushes, Cennini advocates cooking vair tails, and using only the "straightest and firmest hairs out of the middle of the tail". He suggests making small bunches from these hairs, the bunches to be added together according to the size of brush required, "some to fit in a vulture's quill;

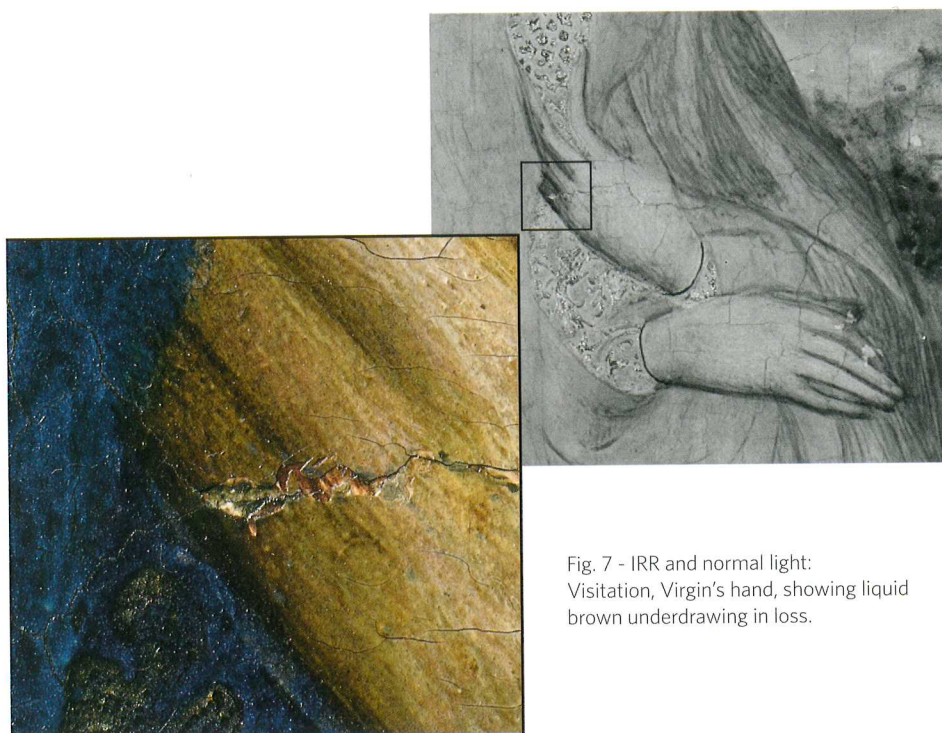


Fig. 7 - IRR and normal light:  
Visitation, Virgin's hand, showing liquid  
brown underdrawing in loss.



some to fit in a goose's quill; some to fit in a quill of a hen's or dove's feather". Swan's quills were used by Broederlam's contemporary Jan Maelwael for the same purpose<sup>40</sup>; a 1399 ducal account recording materials bought by Maelwael for his work at the Champmol lists "100 tubes of swan feathers for making [fine] brushes: 7 sol 6 denier tournois".<sup>41</sup>

### Sculpted motifs

Like the principal figure motifs, Broederlam marked in the stone plinth supporting the falling pagan idol in the Flight into Egypt and the intricate base of the lectern in the Annunciation with a fine brush and liquid medium, probably completing them around the same time. In the case of the lectern, the underdrawing is brushed on using a very thin medium and fairly loose strokes. He later shifted several details of the carved leaf pattern during painting. An absence of open paint losses prevents unambiguous identification of the colour of the underdrawn strokes; however, a brown layer discernible in small losses at the left edge of the motif may represent the underdrawing. In the base of the fallen idol's plinth, the artist cross-hatched the shadows in a liquid medium. Broederlam does not appear to have underdrawn the two stone sculptures on the columns of the pavilion in the Annunciation; these are carefully delineated in the paint layer in a style similar to the painted underdrawing of the lectern.

Broederlam also indicated the lectern's golden eagle in a liquid medium (fig. 19b). This underdrawing is not visible through the gold leaf, but can be seen where the underdrawn tips of feathers extend slightly beyond the gold and under the surrounding ochre-coloured paint. The lines appear greenish in tone through the ochre paint, so could be either brown or black.

### Sketching in the landscape background

Broederlam rapidly sketched in the landscape background with a brush using a dark, fluid medium, boldly indicating all the outlines and contours (see figs. 8a–b, which clearly demonstrates the difference between the liquid underdrawing and the paint layer proper). In place of the delicate lines and hatching strokes seen in figures, shadow areas are characterized by closely applied, broad strokes, sometimes joined to give a wash effect. In rocky outcrops, shady undersides are filled with densely applied, curved strokes, roughly following the forms. The medium varies from dilute to quite concentrated in terms of pigment, and strokes sometimes pool into small dark blobs at the ends, as do the vertical strokes for the fortress in the upper right corner of the right panel. The brush used was most

likely wider and capable of holding more medium than that employed for the figures, but could well have been made of the same type of animal hair.

The distant fortresses were probably included in this drawing phase, since they are also loosely indicated with a brush and dilute medium. As in the rocky outcrops, shadow sides are roughly brushed in.

The colour of the underdrawing proved to be impossible to determine, as losses are usually retouched. It remains feasible that it consists of diluted black ink or paint, or alternatively, that it is brown, but mixed with a heavier concentration of black pigment than the figures.

A further stage, comprising several loose outlines in a dark green paint reinforces important outlines and forms in the landscape background. These strokes appear very dark in infrared and are often hard to distinguish from the first stage of underdrawing. They are rarely visible with the naked eye except in one or two areas, for example, near the thinly painted rocks to the upper left of the Virgin in the Flight into Egypt.<sup>42</sup> Completely concealed by paint, they form part of the design stage for the landscape rather than being associated with the paint layer proper.

### The role of preparatory drawings and model books

Although no drawings by Broederlam have come down to us, it is clear from the lack of fundamental change to the design during execution and the absence of hesitation or sketchiness in the underdrawing of the figures and architectural framework that the artist worked out the compositions beforehand on separate drawing supports. The extent and size of these studies is unknowable, but scaled cartoons are unlikely, as there are no signs of cartoon transfer on the panel, and the underdrawing does not have the appearance of tracing or joined-up pouncing. The composition could have been worked on parchment, paper or with a stylus using a reusable wax or wooden tablet.<sup>43</sup> However, the most likely support for preparatory drawings was paper, as suggested by Champmol ducal accounts listing purchases of art materials.

The presence of ruled guidelines for the architectural structures, often overshooting the actual forms, suggest that Broederlam transferred the composition by eye, perhaps aided by a plumb line, dividers or proportional compasses and a straight edge. For certain architectural elements, figures, and possibly parts of the landscape, Broederlam may well have relied on a model book.





Fig. 8a - IRR. Flight into Egypt. Gold leaf squares applied after liquid underdrawing and before painting.

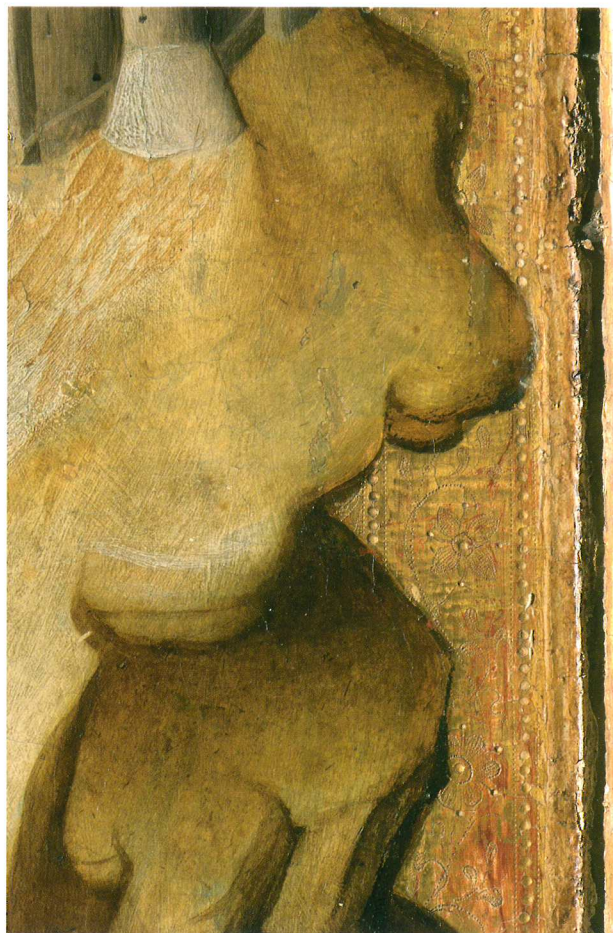


Fig. 8b - Flight into Egypt.

Although no surviving model book can be associated with Broederlam's workshop, several extant examples show the variety of designs and motifs that European artists were recording for their professional use.<sup>44</sup> A collection of drawings on parchment from Bohemia, c. 1390, for example, records human figures in various poses, most replete with hatching and cross-hatching for shadows.<sup>45</sup> Another model collection, on seven boxwood panels, by Jacquemart de Hesdin from the last quarter of the fourteenth century, contains seated and standing figures and busts, delicately modelled in terms of tone.<sup>46</sup> From the same period, there are the anonymous Wiesbaden drawings, comprising a collection of both preparatory and model drawings, showing a mix of pictorial styles seen in Northern France and the Netherlands during that

time.<sup>47</sup> A further group, also from Bohemia, dated 1400–10 shows a collection of heads in a linear style, certain of which recall the design of the angel Gabriel's head in Broederlam's Annunciation scene.<sup>48</sup> A slightly later model book, given to Jacques Daliwe of the Southern Netherlands, comprises a collection of twelve panels on boxwood, some of which depict identifiable religious scenes.<sup>49</sup> The eclectic collection of drawings attributed to an itinerant artist from the first quarter of the fifteenth century includes both direct copies, most likely after frescoes, panels and drawings and his own interpretations of the latter; it includes line drawings of groups of figures, a more sketchy scene including a rocky landscape background similar to those in Broederlam's *Crucifixion Retable* wings and designs for figurative letters.<sup>50</sup>



### GILDING AND EMBELLISHMENT OF GOLD SURFACES

One of the most extraordinary features of Broederlam's painted wings is the rich and varied use of gold. Burnished water-gilding characterizes the sky, saints' haloes, the angel Gabriel's wings, Simeon's mantle trim, floor tiles and still life motifs such as the lily vase. It also offers a glowing underlayer for coloured brocades. The panel's frames are similarly gilded, and form part of the decorative ensemble. Unburnished gilding provides the body colour of the eagle lectern and picks out details such as the ribs of the vaulted temple and pavilion. Diverse techniques embellish the gilded surfaces, including punching, scoring and painting. The overriding presence of gold evokes an otherworldly, spiritual atmosphere for the holy events taking place and would have had special significance for the educated contemporary viewer.<sup>51</sup>

The panels were gilded and tooled prior to painting, although some of the more elaborate embellishments may have been completed during the painting process. This sequence is shown by the infrared image of the border of the gilded sky with the cliff in the right shutter: here, a square-shaped gold leaf, its corners cut slightly, overlaps the underdrawing of the rocky cliff; the paint layer, following incised markings, has been painted directly on top of the left edge of the actual leaf (figs. 8a–b).

The infrared image of the painting also reveals occasional tool marks – particularly those made by the mechanical rolling of a cog-wheel – going underneath original paint, usually at the edges of motifs.<sup>52</sup>

#### Marking out the areas to be gilded

The zones to be gilded were marked by scratching fine lines into the ground with a needle. This step would most likely have been done directly after underdrawing, prior to gilding and painting, as advised by Cennino Cennini.<sup>53</sup>

The incisions would have guided Broederlam or his assistant during gilding, and remained visible during painting. He scratched rounded contours in freehand, but used a ruler for architectural structures, as in the left wing, where the ends of two ruled incised lines can be seen to cross each other neatly at a corner stone. The artist also employed a straight edge for the heavenly rays emanating from God the father and the Holy Spirit in the Annunciation (fig. 9). The junctions of haloes with heads, on the other hand, are scratched in freehand; outer borders of haloes – probably similarly marked – are concealed by a thick black painted line (fig. 9).

Unburnished gold details do not appear to have been pre-marked on the whole, although dark lines, possibly incised, can be made out on the upper left edge of the eagle lectern.

#### Water-gilding

Broederlam – or an assistant – brushed on a thin layer of an orange-red coloured clay known as bole on the areas to be water-gilded, using the incised lines for guidance. This slightly streaky substrate is seen through abrasion and small losses (fig. 10). The use of bole provided a warm underlayer for the gilding, but also a measure of cushioning that chalk alone could not provide, facilitating burnishing and tooling.<sup>54</sup>

Before the application of gold leaf, the surface of the bole would have been rubbed smooth. The delicate process of gilding would have entailed the wetting of small areas of the bole with either water, beaten egg white or glue size and the careful transfer of the gold-leaf squares one by one, tamping each down gently. Kockaert's analysis of a cross-section from an area of gilding concluded that the bole substrate in Broederlam's case was simply wetted.<sup>55</sup>

After drying, the gilded areas would have been burnished with a tool such as an animal tooth or polished agate to obtain a smooth lustre, the joins between the individual leaves disappearing in the process. In the right wing, the size – approximately 3 cm<sup>2</sup> – of these leaves can be seen in the upper right (fig. 8a).

Where gold abuts non-gilded areas, Broederlam generally took care to remove excess gold leaf prior to painting, following Cennini's good practice recommendation to "take your little tools, and scrape off all the gold which is superfluous, or which laps over the figure".<sup>56</sup> However, this is not always the case in the landscape background, as jagged or cut edges of gold leaf sometimes extend under the paint layer, as mentioned above (fig. 8a). Occasionally very small architectural embellishments are painted directly on top of the gold background, for instance the balls and crescent moon on the dome in the right panel. This technique has led to partial flaking of the painted details in question.

#### Gold tooling and other embellishments

Through delicate tooling, Broederlam infused light, relief and interest into the water-gilded areas of the composition. He created composite patterns with a combination of tools, including single dot and ring metal punches, two minute motif punches, a stylus, a needle and a cog-wheel.<sup>57</sup> Some of the gilded





Fig. 9 - Annunciation, Virgin. Water-gilded rays punched with square-toothed cog-wheel; finer, unburnished rays result from mordant gilding.





Fig. 10 - Presentation at the Temple, Simeon's skullcap.

areas were adorned with punching only, such as the background sky and haloes whilst others were partially painted with glazes and opaque details, as in brocades.

Haloes were first swung with compasses, the indented concentric circles serving as guides for the positioning of punched designs (fig. 9). The rounded lines were made with a blunt point, without breaking the gold leaf. The compasses' centre points are visible in the Virgin's halo in the Presentation, but filled in with original paint in the other figures.

As well as indented circles, haloes present specific floral or vegetal designs according to their bearer; the Virgin's halo, for example, has a pattern of undulating stems and leaves in the four scenes, composed of strings of minute, single punch dots,

punctuated every 12 mm or so by a tiny, six-point rosetta with central dot struck with a single motif punch (fig. 9).<sup>58</sup> The latter stamp was employed in various ways in the design of every single halo in the four scenes; in St Anne's halo, for example, it was used to stamp each of six petals of a repeat floral motif, and in Simeon's halo, it alternates with dot-punched leaf motifs in the central band of the halo (fig. 10). The halo designs reveal a consummate mastery of the refinements possible with tooling; for example, by adjusting the distance between dots and modulating the pressure of the hammer strikes, the artist ensured that stippled outlines taper as elegantly as brushstrokes. The delicate border patterns on the gilded sky and frames were painstakingly created in a similar manner using dot punches of various diameters, the larger dots sometimes embellished with the same rosetta stamp used in the haloes.



Large gilded motifs, such as the lily vase, the wings of Gabriel, the fallen idol and Joseph's kettle were deftly granulated to catch the light and give a sense of volume (fig. 11). For curved surfaces and bulbous shapes, rows of closely spaced lines made up of tiny punched dots serve as modelling, their locations pre-scored into the gold with a fine needle. Strokes of brown transparent paint are occasionally present on under- or shadow sides of granulated motifs to increase the sense of three-dimensionality. In the case of the lily vase, its lower section also presents decorative touches of black paint encircled with punched dots.

The illusion of rich, embroidered brocades was made by tooling and painting over burnished gold leaf. Simeon's red garment shows the full gamut of decorative possibilities: after gilding, the surface was scored to imitate the fabric's texture; this was followed by the application of vermilion red paint

for the body of the textile, reserving spaces for a complex phoenix-like bird and foliage design; on the remaining gold parts, the bird's wing spans were marked with blue and the tips accented in white (fig. 19a). Broederlam did not rely on pouncing or stencil patterns for the repeat phoenix motif; the bird's shape and wingspan were adjusted each time according to the width of the space available (fig. 12).<sup>59</sup> The phoenix patterns were painted on flat, with no concession to the actual curves of the drapery; the illusion of drapery folds was created later with the addition of dark translucent red shadows on top of the painted brocade. This contrasts with later Eyckian painting, where brocades on clothing follow the contours of the folds in an illusionist manner. Scoring of the gilding prior to painting appears frequently in brocades, as in the Virgin's mantle in the Annunciation, where undulating scored lines mark the direction of the folds under a layer of red paint.



Fig. 11 - Flight into Egypt, Joseph's kettle.

Fig. 12 - Presentation in the Temple, Simeon's robe.









Fig. 13 - Presentation in the Temple, tiled floor. Design applied with cog-wheel and single motif punch.

The upper half of the golden trim on Simeon's green undergarment is decorated with incised cross-hatching made with a sharp instrument such as a needle, whilst the lower part displays large squares made with a small dot punch. The former was scratched through the gold and bole layers with the aid of a ruler and left starkly visible, without any painted embellishments. A tiny motif – an anchor shape with five dashes – struck by a single motif punch lies at the centre of each dotted square. Similarly, in the gilded band of Simeon's skullcap, there is a four-petalled flower pattern, each repeat made by a single punched dot surrounded by four punched rings, the flowers themselves enclosed in a diamond pattern incised freehand into the gold (fig. 10).

Painted foliage characterizes certain brocades: in the Virgin's brocaded undergarment in the Visitation and in Simeon's embroidered skullcap in the Presentation in the Temple, detailed designs are applied with a fine brush to the gold layer in blue paint. In each case, the reserved gilding was punched with a single dot punch, and painted with delicate touches of red, white or green paint. In Simeon's skullcap, a deep purple glaze, only partially surviving today, was applied on top of the embroidery design to model the rounded shape of the head; a similar glaze has been superimposed on the brocaded undermantle of the Virgin's assistant in the Presentation to form shadows in the folds.



The green and white striped altar cloth in the Presentation shows yet another combination of techniques: on a gilded and burnished base tone, the area was painted with green and white stripes, reserving strips and circles of gold leaf; next, the soft paint was passed over with a square-toothed cog-wheel and the exposed gilding stippled with a fine dot punch.

The tiled floor in the Presentation comprises gold, green, white and blue tiles, arranged in an ordered yet varied manner (fig. 13). After gilding and burnishing, each golden tile was outlined with a square-toothed cog-wheel. Some of these were then punched with a single dot punch whilst others were given a diamond pattern using the same cog-wheel as before. The central points of each diamond were punched with a rosetta, producing the same cluster of tiny dots as observed in the haloes and frame. Remaining tiles were then painted in solid colours and decorated with simple designs in a lighter tone of the same hue. Like the tiled floor, God the Father's golden rays were also burnished and stippled with a square-toothed cog-wheel (fig. 9).

Notwithstanding the large range of techniques Broederlam employed for imitating brocades and other textiles, one method is conspicuous by its absence. Sgraffito, the method by which gold leaf is brushed over with coloured paint, left to dry and then patterns scratched through to reveal the leaf, was one of the principal techniques in panel painting during the same period in Italy.

### Punches

Punches may well have been made in Broederlam's workshop to his own specifications. Broederlam's punchwork, using combinations of single dot, ring and very small motif punches to create designs, is typical of Northern and Central European court painting. Again, as with the sgraffito technique, there is no sign of the use of the larger, carved motif punches so frequent in Tuscan panel painting during the same period.<sup>60</sup>

### Unburnished gold: mordant gilding

A number of gilded motifs do not have a bole underlayer and are not burnished, resulting in a bright and glittery appearance from all viewing angles. The largest and most striking example of these is the golden eagle of the lectern in the Annunciation (fig. 19a). For the most part, unburnished gilding picks out small details: the narrow shafts of light emanating from God the Father – placed side-by-side with burnished gold rays (fig. 9) – the ribs of interior vaults and the decorative bands and flames of hanging oil lamps.<sup>61</sup>

The unburnished gold areas either result from mordant gilding, whereby gold leaf is laid on a tacky substrate and buffed gently rather than burnished, or from the application of shell gold, when gold leaf is ground up with glair (beaten egg white) and applied with a brush. In the case of the *Crucifixion Retable* wings, mordant gilding appears to be the method used. The most compelling evidence is an abraded section of unburnished gilding in a light ray in the Annunciation; here, a raised, narrow, translucent, dark ochre-coloured line is distinguishable on top of the paint, conforming precisely to what would be expected for an oil-based mordant applied with a fine brush (fig. 9). Also, none of the unburnished gold details show brushwork in the gilding itself, such as the tapering of strokes, which might be expected if powdered gold paint were used.

Apart from the golden eagle, where the mordant gilding is probably applied directly on the lead white based priming, Broederlam appears to have placed the mordant gilding on top of the final paint layer. According to Cennini, the mordant mixture was painted on with a brush, allowed to dry for a day or so to obtain the correct degree of tackiness, then gilded with very finely beaten gold leaf, allowed to dry further, and finally swept with a feather to remove excess leaf and rubbed with cotton.<sup>62</sup> Traditionally, mordants for gilding consisted of thickened linseed oil, sometimes mixed with resins and pigments such as lead white, verdigris and various ochres, the latter serving as dryers. A water mordant based on garlic is mentioned in certain sources, including Cennini, who suggests mixing garlic juice with a little white lead and bole and diluting it with urine for use.<sup>63</sup> Unfortunately, there were no cross-sections available for analysis from the areas of unburnished gold in the *Crucifixion Retable*.

At a late stage, Broederlam emphasized some of the gilded areas with thick black lines at the junctions of areas of colour and gilded zones; these include the golden eagle, the golden trim of Simeon's mantle and haloes.

### Gilding in Broederlam's workshop

The skilful application and embellishment of gold leaf in the *Crucifixion Retable* wings using a range of techniques attests to Broederlam's accomplishment in the craft of gilding. Indeed, he was obliged to carry out gilding regularly in his capacity as official painter to the duke. His routine commissions included painting and gilding banners, standards and pennons (small flags) for ceremonies and military expeditions.<sup>64</sup> Gilding was also often part of Broederlam's decorative schemes in the duke's chapels and private residences, such as at the duke's fortified house near Ypres, the Zaelhof,<sup>65</sup> and at the château of Hesdin.







Gold is the first item mentioned in a ducal payment order for eight hundred francs reimbursing Broederlam for materials he bought for gilding and painting the *Crucifixion Retable*.<sup>66</sup> The quality of gold is not mentioned, unlike the orders for gold leaf for Jean de Beaumetz and Jan Maelwael's respective projects at the Charterhouse.<sup>67</sup>

It is likely that Broederlam delegated the preparation and application of the bole substrate for the *Crucifixion* wings, as well as the gilding process to suitably qualified workers.<sup>68</sup> Nonetheless, since gold was so expensive and punching impossible to correct without starting afresh, tooling and other embellishments were most likely the preserve of the master and his most trusted assistants(s).

#### PAINTING THE TWO COMPOSITIONS

The painting style in the two panels suggests a single and highly accomplished hand, doubtless that of Broederlam himself with little or no workshop assistance. In a previous study, one of Leopold Kockaert's main discoveries was that there is a thin, lead white priming layer over the ground and underdrawing in all areas of the composition except the gilded parts.<sup>69</sup> This layer would have sealed the glue ground, providing an even porosity for painting, whilst at the same time ensuring the underdrawing remained visible. It is only visible in cross-sections.

For the most part, Broederlam avoided superposing different zones of paint, ensuring good adhesion of the paint layer. Commenting on the sequence of painting of the different motifs is therefore only possible where there are slight overlaps. For example, the paint of Simeon's purple robe spills over slightly onto a white pillar to the left, indicating that at least part of the architectural setting was painted prior to the draperies. Again, small overlaps in Joseph's yellow head covering reveal that the background was painted first, followed by the head covering, but that at a later stage the artist painted over the tip of the garment with the brown-black rock colour (figs. 6a–b).

#### Faces and hands

Broederlam underpainted flesh areas in a greenish hue, lighter for the highlights and darker, in a copper-based pigment, for the shadows.<sup>70</sup> He left the fine strokes of this underpaint visible or lightly scumbled, giving faces and hands a peculiarly cool tonality. The artist was perhaps influenced by what he knew of Italian panel and mural painting, where green undermodelling in flesh tones is commonplace. For pale complexions such as those of the Virgin and Child, other female characters and Simeon, he then applied opaque pink and white paint for the lighter areas, blending brushstrokes together (figs. 14 and 6b). To define lips, he employed opaque pink and red paint, with a touch of dark red glaze for the darkest shadows. He modelled cheeks and bridges of noses in a soft opaque red. At a later point, he emphasized lips, noses and eyes with neat brown lines. At the same time he would have painted the pupils black and applied thick white paint to suggest the reflected light above lips, the highlight at the end of noses and the whites of eyes. For the ruddy complexion of Joseph, he used light pink and white in the flesh tones for lips and wrinkles, modelled the contours in deep reddish or brown strokes, and strengthened the eyes and nose with fine, dark reddish-brown strokes (fig. 5b). Much attention went into these individualized features, the fine definition and finishing of lips, eyes, noses, cheeks, and different types of skin. The colours of the figures' eyes are also deliberately varied. Some have blue eyes in various tones, others are brown, grey or greenish. However, in terms of physical reality, all of Broederlam's human figures lack the level of detail that would enable us to experience the texture of real skin. They also omit the reflection of light in the eyes, which sparkle of life that is so typical of the realistic portraits of the next generation.

Broederlam painted hair in a stylized manner, in keeping with Gothic courtly style. Simeon's hair and beard, for example, consist of closely spaced white, black and brown painted lines, each strand organized into neat undulating patterns (fig. 6b). The artist allowed himself slightly more liberty in the eyebrows, that consist of a somewhat whimsical arrangement of a few, well-defined black and white strands. Joseph's eyebrows are similarly treated, but his beard shows a more open arrangement of "s" and circular curls in white, black and brown strokes (fig. 5b). The beard is shorter and rounder than Simeon's, as befitting his more rugged lifestyle. The proportion of white strands in their hair and beards suggests their respective ages; Simeon's is almost totally white whilst Joseph's shows a mix of dark and white strands.

Fig. 14 - Flight into Egypt, Virgin and Child.



For the angel Gabriel's golden-coloured locks, Broederlam painted a tight set of sculptural, wave-like curls: on an ochre-coloured undercoat, the hair is modelled in a mix of transparent and opaque earth colours, with tapering strands of intense yellow for highlights and dark brown and black for shadows (fig. 15). The hair of the angels in the upper background is similarly treated.

### Draperies

Draperies were most likely painted after the faces and hands, as there is slight overlapping of the former onto flesh areas. Broederlam tended to adopt one main colouring pigment per drapery, using one or two layers, adding transparent glazes of a similar hue for the shadows.<sup>71</sup> As well as ensuring that the pigments retained their own unique properties and brightness, the use of single or very simple pigment mixtures meant that each drapery stands out as an individual block of colour. Each protagonist in the scene has his or her particular colour code. For the Virgin's dark blue robe – appearing four times – the artist chose the most admired and expensive blue pigment available, natural ultramarine, with the addition of a little lead white for lighter areas (fig. 14). For St Elizabeth's bright red robe, he used vermilion, overlaid with a red glaze in the shadows, and in her rich green cloak, he employed a copper based pigment. In Simeon's mauve-coloured robe, the artist mixed ultramarine and an organic red pigment, varying the proportions so that the highlights appear blue and the shadows purple, sometimes even black.<sup>72</sup> Joseph's yellow head covering and the yellow robe of the angel in the top right corner of the Visitation are markedly different from the rest of the draperies in that a rich red glaze forms the shadows (fig. 5b).<sup>73</sup> Indeed, the character of Joseph seems to have served as a vehicle for Broederlam's decorative impulses. Not being a saint, Joseph could be depicted without the decorum and restraint given to the other characters; he is endowed with a bright, vermilion red robe, mauve trouser hose, yellow head covering with an intense green lining and luxurious white mantle with pink underside.

Broederlam successfully imitated transparency and translucency, painting the draped veil of the Virgin in the Presentation in the Temple in a carefully modulated layer of white paint over the blonde hair, translucent for the most part, but opaque at the creases and for the points of stitching at the edges. It is perhaps one of the most suggestive details of the work, yet without fully capturing the substance of the fabric. The transparent veil in the crib of the polychromed Adoration of the Magi relief on the central panel of the *Crucifixion Triptych*, barely visible from a distance, testifies to an equally

delicate handling of the white paint. It is supremely refined in its rendering, and of exceptional quality.

It is worth noting that for the great part, the draperies do not appear to have suffered any significant alteration in the pigments over time, so that the colours retain much of their original impact.

### Architecture

Broederlam's choice of colour for architectural structures ranges from white, ochre and pink for the main stonework through to red and blue for specific features. In most areas, after applying a pale, opaque paint in a thin layer for the main body of the stonework, the artist applied darker transparent paint to suggest shadows and sculpted mouldings. The mouldings and shadows of the arched recesses under the altar in the Presentation are modelled in a rich, transparent green. In other areas, such as in the stone frieze of the entablature, carved mouldings are picked out in a transparent mid-brown; otherwise dark grey is used. For pink stonework, dark pink glazes form the shadows.

### Landscape background and flora and fauna

In the dry, desert-like landscape, Broederlam applied a smooth ochre-coloured base coat, concealing the underdrawn modelling almost entirely. He then applied green and brown tones, softly blending the transitions. Near the spring in the Flight into Egypt, he glazed the base coat with a transparent, copper green paint, suggesting a lush and fertile setting for the meeting between Mary and Elizabeth.<sup>74</sup> He painted rocks in a dilute brown paint using sweeping brushstrokes, echoing to some extent the loose style of strokes in the underdrawing (fig. 8).

Broederlam painted in the scrubby trees and bushes directly on top of the desert landscape paint (fig. 16). These vegetal forms represent a successful reworking of a known formula that the artist might have picked up from contemporary examples in painting or manuscripts: well-defined leaves and stems, painted in dark brown or black transparent strokes and variations of green, the latter ranging from opaque pale yellow through to translucent green-black (fig. 17). Although hardly naturalistic in approach, Broederlam's neat arrangement of leaves and branches gives a certain vivacity and three-dimensional quality to the vegetation. To what extent he painted from knowledge, tradition, model books, and/or from direct observation is difficult to assess.

Indeed, the landscape seems more likely to be the product of imagination and tradition than genuine observation. It is





Fig. 15 - Annunciation, Gabriel.







comparable to Giotto's landscape in the Flight into Egypt in the Arena Chapel (Cappella degli Scrovegni) in Padua and also to the somewhat more naturalistic work of Giotto's followers, such as the harsh landscapes with sparse vegetation of Altichiero da Zevio in the Oratory of St George, also in Padua.

The vegetation comprises a large variety of individual plants, diversified in species, form and colour. Broederlam clearly intended to represent a multitude of different and roughly identifiable species of trees, bushes, flowers and grasses. Nonetheless, the veracity of each plant was probably secondary to his desire to create a convincing illusion of real vegetation. From our point of view, it seems as if Broederlam had an impressionistic effect in mind, rather than a descriptive realistic or naturalistic portrayal.

Broederlam may have been directly inspired by nature in the depiction of wild flowers in the trellised garden to the left of the Annunciation and in the desert landscape. In the garden, the identifiable flowers – columbine, rose and lily – have been interpreted in terms of iconography.<sup>75</sup> However, the cowslip or primrose (primula) has been painted in a sketchy, almost impressionistic style, the flowers grouped with five or six to a stem and not completely, or only just, opened (fig. 18).

There is no detectible underdrawing for the lily in the Annunciation. The leaves and flowers are painted directly over the background paint, as with the trees.



Fig. 17 - Flight into Egypt, trees.

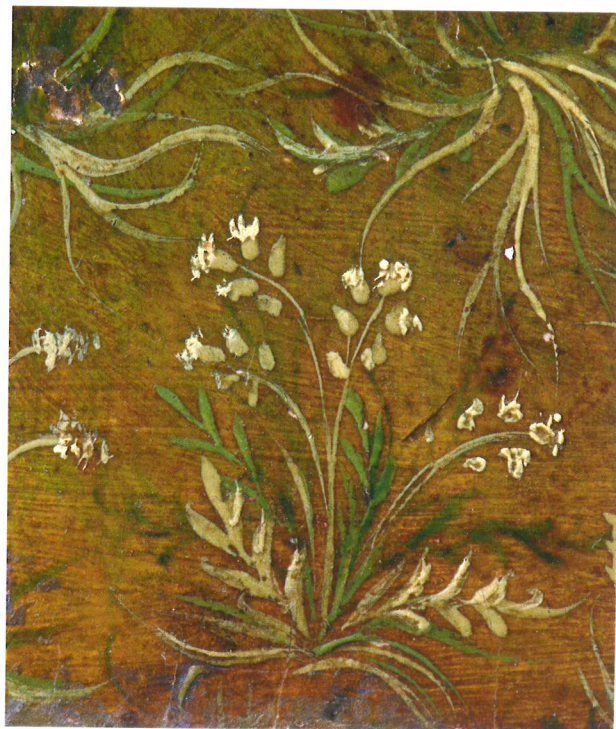


Fig. 18 - Presentation, cowslip.

Fig. 16 - Visitation, desert landscape.





Fig. 19a - Annunciation: eagle lectern.

Broederlam painted the donkey carrying Mary in a straightforward and direct manner. Long black and white strokes suggest the animal's fur over a warm, thin, ochre-coloured undercoat, mid-brown strokes smoothing the transition between the black and white tones. Small birds were applied late during painting, such as the dove of the Holy Spirit in the Annunciation, and the bird of prey in the right background of the same panel.

In Italy, during the last decades of the fourteenth century, there was a growing awareness of nature and the need to

incorporate direct observations, as can be observed in herbals, health manuals, pharmacological works etc. This tendency is exemplified in Giovannino dei' Grassi's sketchbook in Bergamo, which comprises both model drawings and studies after nature. Broederlam's eagle from the eagle lectern in the Annunciation seems to be closer to Giovannino dei' Grassi's designs of eagles than to existing eagle lecterns of the second half of the fourteenth century. In Trento, one of the most successful portrayals of nature and natural landscapes around 1400 can be seen in the



famous wall paintings of the Cycle of the Labours of the Months attributed to Master Wenceslaus (Torre de Aquila, Castello del Buonconsiglio, Trento, late 1390s).<sup>76</sup>

### Modifications during painting

Although conforming to the underdrawn layout for the great part, Broederlam made small adjustments here and there to improve the design. In the stone interior of the Presentation scene, he initially planned a carved leaf pattern in a triangular opening in a wall arch to the right, but dropped it at the paint stage (fig. 2). In the same temple, he abandoned two small decorative triangular corner inserts on the lateral sides. In the square tower of the Annunciation, he added a lancet window and a decorative arch above a larger window, probably to establish a better balance with the other windows. In the same scene, he integrated decorative "rosette" insets into the flat sides of the stone base of the lectern and adjusted the shapes of floral motifs in the lectern's sculpted support. He also made very minor modifications to the perspective of certain features, such as the ceiling of the covered passageway above the angel Gabriel and the lower rightmost corner of the stone tempietto in the Annunciation.

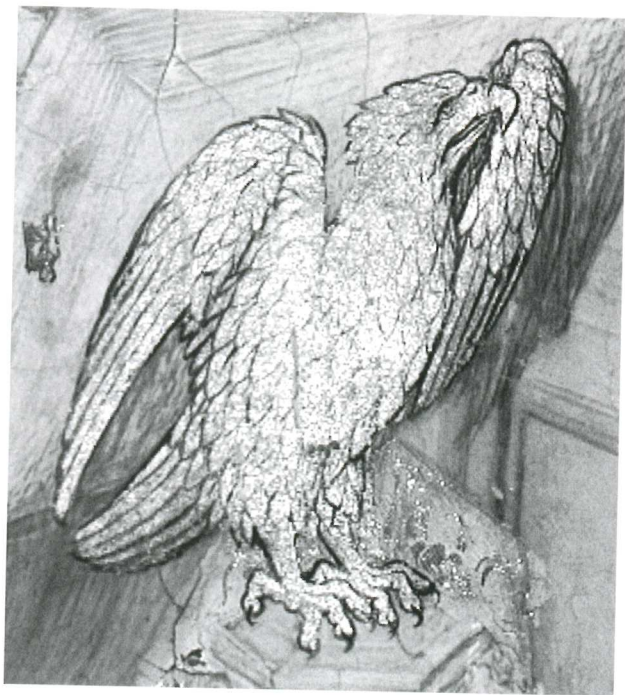


Fig. 19b - IRR. Annunciation, eagle lectern: position of wing modified during painting.

Modifications to the figures, where discernible, are minor and appear to have been made during the painting, rather than drawing stage. They are mostly aesthetic in nature and tend to enhance the Gothic elegance of the forms.

Purely formal changes include the blue drapery of the seated Virgin in the Annunciation scene, painted slightly shorter than its drawn position, and the headdress of the male attendant in the Presentation, simplified during painting. Certain details were smoothed out; for example, the undulating profile of St Anne's white shawl was painted over on the left with background paint to line up the shawl's profile with the green cloak. The lower tip of the golden eagle's left wing was tucked into its body during painting, probably to improve the foreshortening of the motif (fig. 19b). Finally, the hooves and legs of the ass in the Flight into Egypt were shifted up and right.

In terms of expression, Jesus's downward facing pupils in the Presentation in the Temple were moved upwards so that his eyes gaze at his mother's face. Similarly, in the Flight into Egypt, the Virgin's pupils were shifted from the centre of the eyes to the right to focus more on her baby (fig. 14). These minor modifications testify of the artist's concern to improve the psychological interaction between his figures. In the Presentation, Simeon's proper left eye and nose were also raised slightly during painting. The Presentation in the Temple largely follows a standard design, but the way in which the Child playfully takes a strand of hair of Simeon's long grey beard adds a naturalistic touch. It is indeed a gesture a child that age might make. Christ's child-like candour, his youth and his innocent gaze are unprecedented in the work of Broederlam's predecessors. Broederlam has added his personal observations of an ordinary child's behaviour to the traditional motif of the Christ Child, surpassing conventional representations. Human qualities and relationships are observed with empathy and psychological insight. Mary's demeanour attests to her emotional involvement, her tender gestures in all four scenes drawing attention to her maternal qualities.

### Conclusion

The present study of Melchior Broederlam's *Crucifixion Retable* wings, much benefiting from new infrared and photographic documentation, presents a more intimate understanding of the artist's techniques and materials than was previously possible. His methods were not new but he excelled in his craft on both technical and stylistic levels. His attention was focused on the qualities of different textures and materials, illusionistic effects of light and



shade, and the exploration of space and volume. With his expressive faces, he captures a profound sense of humanity and human interaction. Broederlam also achieves a certain level of realism in the depiction of the natural world, possibly brought about by empirical observation in the case of certain flowers. However, in part the landscape and its vegetation echoes the reworking of known formulas. As a whole it is a landscape of tradition and convention, but clearly enlivened with the powers of invention, alongside sharp, naturalistic observations and knowledge of light, colour, form, texture, and executed with a remarkable technical skill, the embryo of a future development.

Interestingly, although clearly influenced by Italian trecento painting in terms of composition and colour, Broederlam's working methods differ considerably. This suggests his practical training and early career took place in the North rather than in Italy.

Subtle modifications in design during both drawing and painting reveal that Broederlam was personally responsible for the creative side of the commission, although he would certainly have had assistance for more menial tasks such as grinding pigments, laying ground and gilding. A commission

as onerous as the *Crucifixion Retable* would have been produced by a team of skilled workers, with the master(s) – in this case Jacques de Baerze and Melchior Broederlam – participating at the highest level.

Studying the Broederlam panels, it becomes apparent that the artist, while exploring a range of illusionistic effects, was limited by traditional techniques. He was nonetheless fully aware of new aesthetic values that were emerging during the period. Looking at Eyckian art and aesthetics, it should not be forgotten that Broederlam's work already explores artistic strategies to improve the imitation of surface appearances and veristic likenesses.

The *Crucifixion Retable* is a rare surviving witness of Philip the Bold's extensive artistic programme in the 1390s, having survived the destruction of the Charterhouse at Champmol. The painted wings, like Broederlam's other tasks as court painter – making flags, banners and supervising interior decorative schemes – served but one purpose: to promulgate the duke's power and influence. The *Crucifixion Retable* represents the high point of this endeavour, assuring Philip the Bold's artistic legacy for future generations.

#### Notes

The images accompanying this article were taken before the restoration of the painted wings.

- 1 This article is based on previously published work: Currie 2009 and Stroo 2012.
- 2 For a complete bibliography up to 1985, see Comblen-Sonkes 1986, 125–33. For the succeeding period until 1998, see Mund and Stroo 1998, 70–71.
- 3 Dehaisnes 1886; Monget 1898; Prost 1902–13.
- 4 De Winter 1976.
- 5 Comblen-Sonkes 1986.
- 6 Kockaert examined the *Crucifixion Retable* in situ in Dijon and took several paint samples for analysis, Comblen-Sonkes 1986, 73–79; see also Kockaert 1984.
- 7 Prochno 2002 (on the *Crucifixion Retable*: 127–136).
- 8 Broederlam's painted wings were examined with an Inframetrics InfraCAM-SWIR™ (short-wave infrared) video camera in 2003. Full assemblies of the infrared reflectograms were made with Adobe Photoshop. Close-up details were taken in 2006 in infrared and normal light using a Phase One LightPhase digital camera back on a Mamiya RZ67 body.
- 9 The panel was not examined from the reverse by the author. The number of horizontal planks in the main part of the wings can be counted due to their convex nature; the number of sections for the upper rectangles and triangles was recorded by Myriam Serck in 2003. The dimensions of the planks in the right wing from the bottom up are as follows: 13 cm, 22 cm, 20.8 cm, 22 cm, 21.2 cm, 19.5 cm (final section not measured).
- 10 Comblen-Sonkes 1986, 76. Examination of the X-radiograph suggests that oak is the wood support, although inspection of the edges of the panels would be necessary for confirmation (Pascale Fraiture, private communication, 1 February 2007).
- 11 Since the X-radiograph is a superimposed image of the sculpted interior scenes and the painted panels, it is impossible to distinguish whether or not dowels are present in the joins of the painted wings.
- 12 The linen fibre was identified at IRPA/KIK by Joseph Vynckier (unpublished report dated 25 May 1975; cited in Comblen-Sonkes 1986, 77–78).
- 13 On the panel construction of Broederlam's *Crucifixion Retable*, see Verougstraete and Van Schoute 1995: 373–374 and Verougstraete and Van Schoute 1996, 87 and 91–92.
- 14 Theophilus (ed. Hawthorne and Smith [1963] 1979).
- 15 "How you should put cloth on a panel. Chapter CXIII", Cennini (ed. Thompson 1960): 70.
- 16 Cennini (ed. Thompson 1960): 69–70.
- 17 Helene Verougstraete and Roger Van Schoute cite the case of a wing of a lost pre-Eyckian altarpiece; the *Coronation of the Virgin* and the *Annunciation* in the Antwerp Museum of Fine Arts as having a linen interleaf on the inner side of the wing (Verougstraete and Van Schoute 1996, 87–88, figs. 2–3).
- 18 For example, see Dominique Deneffe, cat. no. 4, p. 203 and note 73. The *Wilton Diptych* (National Gallery, London) – dated around the same time as the *Crucifixion Retable* – has a mat of fibres, derived from parchment, between the panel and chalk ground layer (but not on the frames), probably intended "to reinforce the adhesion of the ground to the panel". (Gordon 1993, 74).
- 19 For a discussion of the issue of parchment, canvas and fibres as structural components in the grounds of medieval paintings, and a comparative table of occurrences between 1100 and 1600 in Italy, Spain, Germany, Austria, Switzerland, Norway, Sweden, Denmark, England and Bohemia, see Skaug 2006, 182–201.
- 20 Kockaert 1984, 84.19.7 and Comblen-Sonkes 1986, 74–78.
- 21 Myriam Serck (notes from 2003 examination).
- 22 "How to gesso an ancona with gesso sottile; and how to temper it. Chapter CXVII", Cennini (ed. Thompson 1960): 72. On the making of hog hair brushes, see "How you should make bristle brushes, and in what manner. Chapter LXV", *ibid.*, 41.



- 23 "Whitening hide and wood with Gesso", Theophilus (ed. Dodwell 1961): 18. This citation is part of Theophilus's description of how to prepare panels of altars and doors, following on after his instructions to glue a layer of hide or cloth to the wood support. Note that the word "shavewood" is Dodwell's translation for Theophilus's term "uocatur asperella".
- 24 "How wood is to be prepared before painting on it", Chapter XXIV. [268], in "Manuscripts of Jehan le Begue" (Merrifield [1849] 1967, 228). For references to the use of horsetail in later historical treatises, see Currie and Ghys 2006, 198–99.
- 25 The ducal accounts record the purchase of "une peau de chien de mer" alongside other artists' materials such as pigments and oil for the use of Jan Maelwael in his panels and altarpieces for the Charterhouse of Champmol (ADCO B 11673: fol. 55v–56r in Prochno 2002, 334); Cennini advises "cuttle such as the goldsmiths use for casting" for smoothing down boxwood panels for drawing, Cennini (ed. Thompson 1960): 4.
- 26 Cennini (ed. Thompson 1960): 74 and note 71.
- 27 On the status of artists, apprentices and other studio hands during this period, particularly in Dijon, see Cassagnes-Brouquet 2004b.
- 28 "Pour autres deniers paieez par ledit t[re]sorier, c'est assavoir [...] aux varlez de Melchior peintre et varlet de chambre de mons[eigneur] qui euvre[n]t en une table d'ault q[ue] led[it] Melchior paint po[ur] mondit s[eigneur], pour don a eulz fait: V frs. XII s VI d. t. laquelle table s[er]a portee en l'eglise des chartres les Dijon" (For other moneys paid by the said treasurer, to with [...] to the valets of Melchior painter and the valet de chambre of milord who are working on an altarpiece that the said Melchior is painting for my said lord, for a gift to them of 5 francs 12 sol 4 denier tournois for which the panel will be carried to the church of the Charterhouse in Dijon), ADCO B 1500: fol. 172v (Prochno 2002, 262).
- 29 ADCO B 1500: fol. 87v (Dehaisnes 1886, 707). Hues de Boulogne is also mentioned in the Ducal accounts of 1398, where it states that he is a painter of the Duke residing at Hesdin, and that he was receiving one hundred francs wages per year, paid in two instalments (ADN Lille [Dehaisnes 1886, 767]).
- 30 Laurens de Boulogne was "peintre du chastel et garde des engiens d'esbattement" from 1372–79, a job involving the maintenance of the castle's interior decoration and the paintwork on the hydraulically powered automata (ADN Hesdin [Dehaisnes 1886, 508]). For documents relating to Broederlam's supervision of restoration and decorative works at the Château of Hesdin during this period, see Dehaisnes 1886, 623, 638, 644, 652, 683 and 687–88.
- 31 "Melchior worked with several others of the said profession [for a] long period of time." ADCO B 1526: fol. 163v–164r (Prochno 2002, 265).
- 32 In the annotated infrared reflectograms, where ruled construction lines are likely to continue but are no longer discernible (e.g. areas of gilding), they are marked with a paler line. It is also likely that such lines continued through faces and draperies, and that the artist partially erased them after drawing in the figures; these are also marked with a paler line.
- 33 The use of metalpoint for the underdrawing of the architecture was first proposed in Comblen-Sonkes 1986, 72. Jeffrey Jennings demonstrated through practical tests that silverpoint lying underneath a paint layer is detectable in infrared reflectography (Jennings 1993, particularly page 245, notes 15–16 and plate 101). Tests on the visibility of various drawing materials under a painted surface, including silverpoint, are also described in Kirby et al. 2002, 27 and figs. 33–34. In this study, the silverpoint line is described by the authors as "fine and very even".
- 34 It is possible that these late modifications were made after the application of the lead white priming, which would explain their darker appearance in the infrared photograph (see below, "Lead white priming").
- 35 Florentine artist, architect and theorist Leon Battista Alberti was the first to describe how painters should represent three-dimensional forms using linear or one point perspective in his *Della Pittura* (1435–36).
- 36 Panofsky 1953, 87.
- 37 Sophie Jugie suggests that Jacques de Baerze, in making the *Crucifixion Retable* for the church of the Charterhouse, may have had to take into account an architectural constraint, such as a descending vault, which would explain its unique form (Dijon 2004, 194).
- 38 Panofsky 1953, 87. "A Hennequin de Bruges, peintre du Roy nostre seigneur, sur ce qui lui puet ou pourra estre deu a cause des pourtraitures et patrons par lui faiz pour lesdiz tapiz à l'histoire de l'Appocalice, ..."
- 39 Kockaert identifies this black as charcoal and the medium of the underdrawing as tempera (Kockaert 1984, 84.19.7). These results could not be verified during the current campaign through lack of samples.
- 40 Cennini (ed. Torresi 2004): 91.
- 41 "Ic tuyaux de plumes de cigne pour faire pinceaux: VII s. VI. d. t.", ADCO B 11673: fol. 54v–55v (Prochno 2002, 334).
- 42 These green lines can be distinguished with the naked eye through thin paint. In the infrared reflectogram, they are easily confused with black underdrawing lines.
- 43 Wooden tablets for drawing were made of box or figwood and prepared with bone for use (Nottingham and London 1983, 44 and 220); on wax tablets, see Scheller 1995, 2–4.
- 44 For a recent analysis of surviving model books, see Scheller 1995.
- 45 Scheller 1995, cat. no. 18.
- 46 *Ibid.*, cat. no. 19.
- 47 Renger 1987.
- 48 Scheller 1995, cat. no. 20.
- 49 *Ibid.*, cat. no. 21.
- 50 *Ibid.*, cat. no. 31. The landscape background is seen in *Ibid.* fig. 192.
- 51 See Baert 2009 on the symbolic meaning of gilding in paintings.
- 52 The term "cog wheel", also known as a "rotella" or "rulino" is taken from Skaug 1994, vol. 1, 65.
- 53 "When you have got your whole ancona drawn in, take a needle mounted in a little stick; and scratch over the outlines of the figure against the grounds which you have to gild, and the ornaments which are to be made for the figures, and any special draperies which are to be made of cloth of gold", in "How you should mark out the outlines of the figures for gilding the grounds. Chapter CXXIII", Cennini (ed. Thompson 1960): 76, original Italian text from Cennini (ed. Torresi 2004): 119.
- 54 Billinge et al. 1997, 31. For definitions of bole and its use as a gilder's clay, see Nadolny 2006, 149.
- 55 Kockaert 1984, 84.19.8.
- 56 "Chapter CXL How you should begin swinging the diadems and do stamping on the gold, and mark out the outlines of the figures", Cennini (ed. Thompson 1960): 86.
- 57 On punch tools and punch work, see Skaug 1994, 12–14 (glossary of terms) and 62–66 (execution of gold tooling).
- 58 The tool used to make this single motif rosetta was only about 1.5 mm in diameter.
- 59 This was ascertained through tracing and superposing the repeated motifs. The design was inspired by Italian silks of the last quarter of the 14th century, which were in turn based on Chinese fabrics with the common motif of the Chinese *fenghuang*, such as this early 14th century Chinese polychrome silk embroidery in the Metropolitan Museum of Art in New York with two types of phoenixes (*fenghuang* and *luan*) (Yuan period 1279–1368). See Watt, Wardwell and Rossabi 1997, 196–99, fig. 60; Geelen and Steyaert 2011, 31.
- 60 See Printa 1965 and Idem 1998. On different types of punches, see also Skaug 1994, 65–66.
- 61 Myriam Serck considers it possible that these small details might all represent later additions on the basis of the quality of execution, although has no such reservations regarding the golden eagle (private communication, 29 March 2007).
- 62 "A short section on mordant gilding. How to make a standard mordant, and how to gild with it.", Cennini (ed. Thompson 1960): 96–97.
- 63 "How to make a mordant out of garlic.", Cennini (ed. Thompson 1960): 97–98. See also Alcherius's recipe number 106, "To make a mordant with garlic", a recipe he states he copied in 1410 from a book lent to him by a painter living in Bologna (Merrifield [1849] 1967, 9 and 95).
- 64 ADCO B 1466: fol. 21v (Dehaisnes 1886, 636) and ADCO B 1486: fol. 30 (*Ibid.*, 688).
- 65 ADN Flandre (Dehaisnes 1886, 740) and Annales 1862, 184–85.
- 66 ADCO B 1501: fol. 62r, 66v and 90r (Prochno 2002, 262–63).
- 67 See Nash 2010, 133.
- 68 See "Workshop assistance".
- 69 Kockaert's observations in Comblen-Sonkes 1986, 73. Kockaert identified the medium of this layer as protein-oil (whole egg). A lead white oil priming layer was noted above the chalk-glue ground and underdrawing layers in the Thornham Parva Retable (English, early 14th century), see Massing 2003, 44.
- 70 Kockaert 1984, 84.19.8.
- 71 *Ibid.*
- 72 *Ibid.*
- 73 Kockaert identifies the yellow pigment in the angel as lead-tin yellow II, see *Ibid.*
- 74 *Ibid.*, 84.19.7–8.
- 75 Comblen-Sonkes 1986, 85–86.
- 76 Wenceslaus worked for the Bohemian Prince-Bishop, George of Liechtenstein, in 1397.