

GOLD-BROCADED VELVETS IN PAINTINGS BY GEERTGEN TOT SINT JANS: A STUDY OF GEERTGEN'S PAINTING TECHNIQUE TO IMITATE GOLD-BROCADED VELVETS AND A COMPARISON WITH THE *RAISING OF LAZARUS* BY ALBERT VAN OUWATER

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ABSTRACT The Northern Netherlandish artist Geertgen tot Sint Jans depicted sumptuous and costly gold-brocaded silk velvets in most of his paintings. This article discusses the different techniques employed in painting these textiles – the underdrawing, the build-up of the paint layers and the patterns – as revealed by technical examination, including close-up photography, tracings, infrared reflectography (IRR), X-radiography and scientific analysis. The study of the gold-brocaded velvets by Geertgen provides detailed information about the specific working methods used by this artist, which – in turn – are compared to those of Geertgen's alleged teacher Albrecht van Ouwater, used in his only known painting: the *Raising of Lazarus*.

Introduction¹

Gold-brocaded textiles, especially gold-brocaded velvets, were among the most sumptuous and costly of all luxury goods in fifteenth-century Europe, to be owned only by the very rich.² Gold-brocaded velvets played a primary role in Early Netherlandish paintings too; important figures – such as kings and saints – often wore gold-brocaded velvet. The study of these fabrics in Early Netherlandish paintings can be informative on different levels. It might enlighten aspects of fifteenth-century studio practice and help in questions of attribution, as has been demonstrated by the study of gold-brocaded velvets by Cornelis Engebrechtsz (c. 1462–1527).³ This article discusses the painting techniques used to imitate gold-brocaded velvets employed by the late fifteenth-century Haarlem painter Geertgen tot Sint Jans (1455/65–1485/95) and his workshop. In all of the larger panels attributed to Geertgen these luxury fabrics are represented, although sometimes only in a modest form, showing

the gold-brocaded velvet solely in sleeves or in a partly visible tunic.

Although the workshop practices of Geertgen have been discussed in recent literature, the main focus has mostly been on the underdrawing and a few characteristics of his painting technique, such as the use of a grey paint layer beneath his blues, and red-brown contour lines in his flesh tones.⁴ A systematic examination of his painted gold-brocaded velvets has, so far, never been undertaken. Studying this specific motif will increase understanding of the working methods of the painter and his workshop. Some artists connected with Geertgen, most notably his supposed teacher Albert van Ouwater (active c. 1460–1480), will also be discussed.

Geertgen tot Sint Jans

Information about the life and career of Geertgen tot Sint Jans is scarce and its reliability is sometimes difficult to



Figure 1 Geertgen tot Sint Jans, *Lamentation of Christ*, c. 1484, panel, 175 × 139 cm, Kunsthistorisches Museum, Vienna, inv. no. GG_991.



Figure 2 Geertgen tot Sint Jans, *The Burning of the Bones of Saint John the Baptist* (also called *The Fate of the Earthly Remains of Saint John the Baptist*), c. 1484, panel, 172 × 139 cm, Kunsthistorisches Museum, Vienna, inv. no. GG_993.



Figure 3 Geertgen tot Sint Jans, *Raising of Lazarus*, c. 1485, panel, 125 × 97 cm, Musée du Louvre, Paris, inv. no. RF 1285.

judge. Karel van Mander (1548–1606) is one of the first to mention him in his *Schilder-boeck* in 1604.⁵ Apart from one exception, fifteenth-century sources do not allude to him at all.⁶ Although Van Mander does not mention his date of birth or the year of his death, from more indirect information it can

been concluded that Geertgen must have been born somewhere between 1455 and 1465 and that he died – according to Van Mander at the young age of 28 – between 1485 and 1495.⁷ His last name ‘tot Sint Jans’ is explained by Van Mander; Geertgen lived at the Brotherhood of Sint Jans in Haarlem, although without being a member of the order. Though little is known about the practical arrangements of Geertgen’s studio, recent art technological research has shown that he must have had a workshop in which more than one pair of hands were active.⁸ Dendrochronological research of some of the paintings previously attributed to him has shown that, after the probable date of his death, Geertgen’s workshop must have continued for some time at least.⁹

The paintings

Only two panels – at one time forming the front and back of one altar wing – can be attributed to Geertgen tot Sint Jans with reasonable certainty: the *Lamentation of Christ* and the *Burning of the Bones of Saint John*, both in the Kunsthistorisches Museum in Vienna (Figures 1 and 2).¹⁰ A description of both panels was given by Van Mander in 1604.¹¹ These two large panels are at the heart of the current research, even though art technological information on them is far from complete.¹²

The extent of Geertgen’s oeuvre has in the past varied quite strongly according to different scholars.¹³ Paintings have previously been attributed mostly on the basis of a



Figure 4 Geertgen tot Sint Jans, *Madonna and Child*, c. 1485, panel, 83 × 53.5 cm, Staatliche Museen (Gemäldegalerie), Berlin, inv. no. 1853.

stylistic comparison to the two Vienna panels; only in the last 25 years have technical research methods, such as infrared reflectography (IRR) and dendrochronology, been taken into account. Of all the attributions, the least doubted are the panels with the *Raising of Lazarus* from Paris, the *Adoration* triptych from Prague and the *Adoration* from Cleveland (Figure 3).¹⁴ More widely discussed are the *Adoration* from Winterthur, the *Madonna and Child* from Berlin and the *Adoration*, the *Holy Kinship* and the *Tree of Jesse* from the Rijksmuseum in Amsterdam (Figures 4–7).¹⁵ The *Tree of Jesse* is probably the most debated of

them all and has often been attributed to Jan Mostaert (c. 1474–1552) as a juvenile work.¹⁶ However, we will put the attribution question aside for now. For this study, gold-brocaded velvets were examined on as many paintings connected to Geertgen or his workshop as possible.¹⁷ Molly Faries aptly wrote in 2007:

The workshop is a new paradigm for the study of Geertgen's works, and it has implications for all the attributions. In the past art historians have focused on small stylistic differences in the paintings, and



Figure 5 Geertgen tot Sint Jans, *Adoration of the Kings*, c. 1480–1485, panel, 91.5 × 72 cm, Rijksmuseum, Amsterdam, inv. no. SK-A-2150.



Figure 7 Geertgen tot Sint Jans, *Tree of Jesse*, c. 1500, panel, 89.8 × 60.6 cm, Rijksmuseum, Amsterdam, inv. no. SK-A-3901.



Figure 6 Geertgen tot Sint Jans, *Holy Kinship*, c. 1495, panel, 137.2 × 105.8 cm, Rijksmuseum, Amsterdam, inv. no. SK-A-500.

there has been a tendency to break down the group of works associated with Geertgen tot Sint Jans into any number of separate masters. What I am suggest-

ing is exactly the opposite: reconstitute the larger group by building on workshop associations. Once the larger construct of Geertgen's workshop has been established, the re-sorting and refining can begin, but it must be done on a basis that includes technical connoisseurship. Aspects of the working process such as those discussed above must figure in the argumentation. Routine procedures and the degree of acceptable deviation from them must also be established for the application of paint, such as the use of reddish brown contours, specific mixtures for colors, areas of glazing, stroke patterns for the painting of brocades, foliage etc.¹⁸

This study focuses on the aspect referred to as 'stroke patterns for the painting of brocades'; it will be expanded to include all aspects of the technique that the artist employed to paint gold-brocaded velvets.¹⁹

Painting technique: the layer build-up

The underdrawing

The first step in the production of a fifteenth-century painting on panel – after the application and smoothing of the



Figure 8 (Above) Geertgen tot Sint Jans, *Lamentation*: detail of the right sleeve of Mary Magdalene's dress. (Below) Digital IRR assembly of the same detail. (IRR © Prof. Dr. Molly Faries / RKD, Den Haag.)



Figure 9 (Above) Geertgen tot Sint Jans, *Lamentation*: detail of the left sleeve of Mary Magdalene's dress. (Below) Digital IRR assembly of the same detail. (IRR © Prof. Dr. Molly Faries / RKD, Den Haag.)

ground layers – was the application of an underdrawing.²⁰ Underdrawing in the paintings by Geertgen tot Sint Jans has been studied extensively.²¹ Geertgen generally used a liquid medium for his underdrawing, applied in characteristic long, fluid and precisely placed strokes to delineate the contours. He used relatively little hatching to indicate shading and volume.²² A dry medium has been found on several paintings alongside the liquid underdrawing, for example to sketch the background scenery. It has also been found *over* the liquid underdrawing as a corrective phase, in a more free and expressive manner.²³

In a previous study on gold-brocaded velvets in paintings by Cornelis Engebrechtsz, it was found that the underdrawing in his paintings would always depict the contours of the drapery and the modelling of the folds, but never in this stage was the brocade pattern applied.²⁴ Unfortunately, in the paintings by Geertgen such a conclusion about the underdrawing cannot be made so easily.²⁵ In three cases, the Prague *Adoration*, the Amsterdam *Holy Kinship* and *Tree of Jesse*, the paint layers could not be penetrated at all by IRR; the whole area appears grey with only little differentiation.²⁶ In the shadows of Caspar's tunic on the Amsterdam *Adoration* a few lines are visible that seem to relate to the underdrawing of the contours and folds of the drapery. No underdrawing is visible for the pattern. Similarly in Caspar's gold-brocaded mantle on the

Cleveland *Adoration* only a few individual lines under the left arm of the king seem to indicate an underdrawing of the drapery folds.²⁷ The IR image of the pattern itself is dark grey – much darker than the pattern on the IRR of the Amsterdam *Adoration* – standing out boldly in IRR. A close comparison of the pattern lines in IRR with the paint layer itself clearly shows that the grey pattern lines in IRR come from the paint layers. The Winterthur *Adoration* is probably the most deviating of all these examples: even though locally an underdrawing is visible with the naked eye, in infrared nothing is visible, suggesting a drawing medium invisible in infrared, possibly iron gall ink.²⁸ It is clear from all of these examples that – even if a pattern was applied in the underdrawing stage – this cannot be found using IRR.

Although complete IRR documentation of all the gold-brocaded areas on the two Vienna panels has never been executed, the material that is available holds a small surprise when the sleeves of Mary Magdalene in the *Lamentation* are compared to the examples described above.²⁹ In the gold-brocaded sleeves the underdrawn contours and the small folds of the inside of the elbows are easily visible. The pattern may also have been underdrawn (Figures 8 and 9). In IRR the lines of the pattern are of a similar tone and quality as the lines of the underdrawing visible in surrounding areas, for example in the hatched lines on the bodice. When comparing the grey pattern in IRR to the painted pattern,



Figure 10 Geertgen tot Sint Jans, *Burning of the Bones*: detail of the gold-brocaded polychrome velvet of Emperor Julian's mantle.

there seem to be a few smaller differences, mostly in Mary Magdalene's left sleeve, suggesting that what we see in IRR is indeed underdrawing and not (just) paint. The painted pattern has a few small areas with 'fills' between the lines. In IRR these areas are a lighter tone of grey than the pattern lines themselves, suggesting that these 'fills' come from the paint and were not underdrawn. Also, a painted flower shape of the pattern in the inner elbow of the sleeve is much lighter in tone in IRR than the rest of the grey pattern, suggesting it was not underdrawn, but was added during the painting process.

There are only a few instances in Early Netherlandish paintings known to us where the pattern of a gold-brocaded velvet has been underdrawn in a medium visible in infrared: the cope of Saint Donatius by Jan van Eyck (c. 1390–1441) on the *Madonna and Child with Canon Van der Paele*, and the mantle of Caspar in the *Adoration* triptych by Jacob Cornelisz van Oostanen (c. 1465/75–1533).³⁰ One possible explanation for these exceptions might be that they were painted after life instead of being transferred from a model drawing in the studio. Monnas has argued that the patterns of gold-brocaded textiles painted by Van Eyck are composed from different stock drawings, to form the right iconographic content for each painting.³¹ The question as to whether Donatius' cope was painted after life is a complex one and will be addressed in a forthcoming article.³²

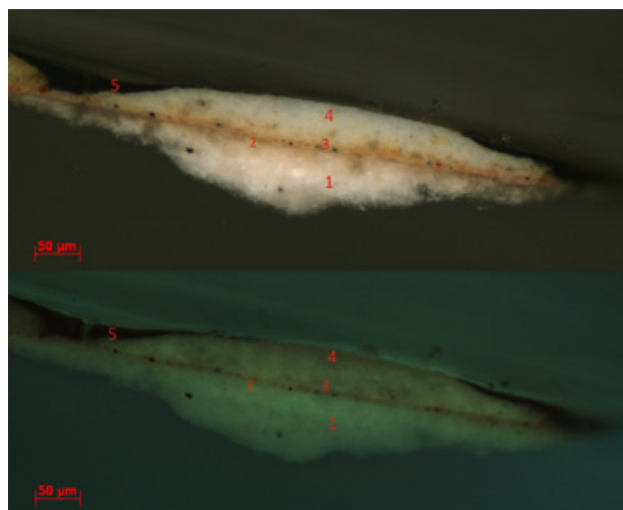


Figure 11 Geertgen tot Sint Jans, *Tree of Jesse*: cross-section of sample RMA-AW-170/2 taken from King David's mantle. The cross-section was photographed in normal light (above) and UV fluorescence (below) at a magnification of 200×. Only the right half of the sample is visible at this magnification.

One thing is clear however – of all fifteenth-century artists, Jan van Eyck as a court painter was the most likely to come into close contact with expensive gold-brocaded textiles. As for the pattern on the mantle of King Caspar on Jacob Cornelisz's *Adoration* triptych, this may indeed have been drawn after life. It is the sole underdrawn example in all of Cornelisz's gold-brocaded velvets and was underdrawn in a quick, sketchy manner. Also its painting style is more loose, and seems to differ from other examples by this artist.³³ Although Geertgen's case of Mary Magdalene's sleeves is too small and uncertain to prove convincingly that on the Vienna panels Geertgen drew all patterns in the underdrawing phase and after life, it remains an interesting piece of information that would benefit from further IRR study of the rest of the gold-brocaded areas in these particular panels.

Painting the first layers

After the underdrawing stage, the next phase in Geertgen's painted gold brocades – and also in those by most other artists studied – was an underpainting covering the entire textile with a base tone of brown paint. The brown paint differs in tone per painting or even per gold-brocaded textile on one panel, but when comparing all Geertgen's paintings, two main groups of brown colour, or rather colour tones, can be distinguished. The first type is ochre tinted, sometimes leaning more towards a greyish-brown, sometimes more towards a warmer orange-brown. This colour can be found on the gold-brocaded textiles of the Vienna panels, the Paris *Raising of Lazarus*, the Berlin *Madonna and Child* and all three *Adoration* panels. The second type clearly differs from the first and is altogether lighter and much more pinkish in tone, a light rosy-brown. This colour can be found on the *Holy Kinship* and the *Tree of Jesse*.³⁴

Apart from the difference in tone, in both groups the underlayer was always painted from light to dark; modelling the folds of the drapery by applying the lighter colour first and then working towards the darker shadows. A careful blending of the paint layers is characteristic, smoothing the transitions between the different tones. The lightest part of the modelling almost always seems thinly applied, with a somewhat 'streaky' appearance through which the ground layer shimmers (Figure 10). The one exception is the Berlin *Madonna and Child* on which the brown base tone is applied quite thickly with a clearly visible brushstroke, unlike any of the other examples. In the darker parts of the modelling, the shadows of the drapery folds, a more opaque paint was applied without exception.

Only one paint sample of a gold-brocaded fabric on a Geertgen painting was available for this study; it was taken from the gold-brocaded mantle of King David on the *Tree of Jesse* (Figure 11).³⁵ The first layer is a thick white ground containing chalk and glue.³⁶ The second very thin layer – less than 5 µm – is only easily visible in UV and is rich in binding medium, presumably oil with a small quantity of lead white pigment. This layer has been found in all other paint samples from this painting, and served to isolate the ground layer and probably also to fix the underdrawing. The third is the light rosy-brown layer of the undermodelling of the gold-brocaded mantle mentioned in the previous section. This thin layer of c. 10 µm confirms the observations that – at least in this particular example – the brown underlayer has been thinly applied. It contains very fine white and orange-red particles and some larger particles that are orange-red, black and dark pinkish-red in colour.³⁷ Layer 4 is a relatively thick layer with a maximum of 50 µm, containing fine white and yellow particles, while layer 5 is maximum 25 µm thick, consisting of very fine black pigment particles.

To help identify the pigments in the sample, dispersive X-ray fluorescence (XRF) was performed on four separate areas of the sample.³⁸ Peaks for calcium (Ca), lead (Pb) and a smaller one for tin (Sn) were found, apart from substantial traces of mercury (Hg), iron (Fe) and copper (Cu), and smaller traces of manganese (Mn) and potassium (K). The calcium peak comes from the chalk in the ground layer(s) and possibly also from the black pigment used for layer 5. Lead may be connected to three different pigments, all of them in use during the fifteenth century: lead white, lead-tin yellow and red lead. Lead white particles seem to be present in layers 2, 3 and 4. Lead-tin yellow is confirmed by the small tin peak and clearly comes from layer 4. Mercury may indicate the presence of vermilion, present as fine orange-red particles in layer 3. The traces of potassium probably come from a small amount of an organic red lake pigment, visible in layer 3 as dark pinkish-red particles.³⁹ Lastly, the traces of iron and manganese likely refer to small amounts of earth pigments, such as ochre (Fe) and umber (Mn), which may have been impurities or conscious additions to speed up the drying of the layer.

Painting the pattern

Even though in the instance of Mary Magdalene's sleeves on the Vienna *Lamentation*, the pattern seems to have been applied in the underdrawing phase, this working order is by no means certain for the other paintings by Geertgen. As has been said, no other indication of a pattern applied in the underdrawing stage was found. In this respect the investigations of Bart Devolder are revealing. In 2008 he conducted research on this subject by studying 16 Early Netherlandish paintings in the National Gallery in Washington. He found several different examples of pattern transfer: incised, painted or underdrawn lines. All were executed or applied *after* the painting of the base tone.⁴⁰ There is a practical explanation why a pattern would be applied after painting the first paint layers. A pattern applied in the underdrawing stage could become difficult to see by the artist once the first paint layers were applied over it.

In addition, in the paintings by Cornelis Engebrechtsz and all but one painting by Jacob Cornelisz, it was concluded that the pattern was applied only after the first modelling of the paint layers, even though no evidence was found for the exact methods of transfer.⁴¹ Similarly Devolder in his research on Early Netherlandish paintings had many examples in which he found no preparation at all.⁴² Arie Wallert has suggested that white chalk may have been used for pattern transfer.⁴³ White chalk effectively disappears when covered with oil paint and does not show up in either IRR or X-ray.⁴⁴ Similarly, in the paintings by Geertgen, apart from the lack of evidence in the underdrawing stage, no evidence was found of incised lines or some form of underpainting. So, apart from Mary Magdalene's sleeves, we have no way of knowing for certain in which stage and how Geertgen applied his patterns.⁴⁵ Only in the case of the *Tree of Jesse* can it be deduced that pattern transfer must have been executed at a very late stage; this is discussed at the end of this section.

Geertgen often used red – varying in colour from brownish to bright red – to paint his brocade patterns (see Figures 3, 5 and 7). Red was one of the most popular colours both for real gold-brocaded velvets and for painted ones. In textiles, the red insect dyes kermes and cochineal were one of the – if not the – most expensive dyes in use during the fifteenth century.⁴⁶ Its cost, intensity and durability made it one of the most popular of all textile dyes and this is reflected in fifteenth-century paintings on which red seems to be the velvet colour depicted most often. Perhaps even more expensive due to the complexity in weaving are multi-coloured velvets. In Geertgen's paintings these appear on the two figures important enough to wear such valuable textiles: Emperor Julian the Apostate on the Vienna *Burning of the Bones* and Saint Elisabeth on the *Holy Kinship* (see Figures 2 and 6).⁴⁷

In most of the paintings discussed, Geertgen imitated a velvet weave for the pattern in his gold brocades and not the more common linen or even satin weave, for example gold-brocaded lampas silk. This conclusion is drawn not so much from a convincingly painted velvet sheen as from the

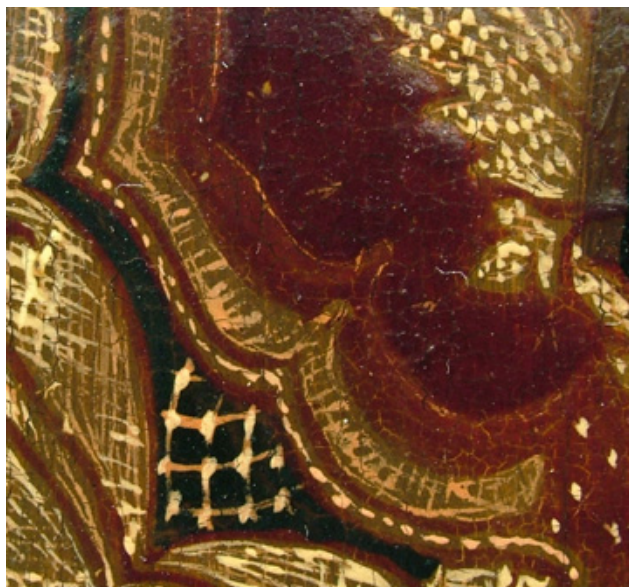


Figure 12 Geertgen tot Sint Jans, *Raising of Lazarus*: detail of the gold-brocaded red velvet mantle of the anonymous Jew.

presence of a double height of pile and *alluccionato*.⁴⁸ Both weaving techniques are only found in velvet.⁴⁹ Because of its tufted nature, velvet is the only weave that can be made into different heights of pile, most often two but on rare occasions three pile heights can be found.⁵⁰ Geertgen frequently depicted velvet that was woven in two heights of

pile: on the skirt of Saint Elisabeth (*Holy Kinship*), on the tunic of Balthazar (*Amsterdam Adoration*), on the mantle of the anonymous Jew (*Raising of Lazarus*), on the mantle of Caspar (*Adoration*) and on the cloth of honour (*Madonna and Child*) (Figures 12 and 13). The use of *alluccionato* in several of Geertgen's gold-brocaded fabrics is another clue that identifies them as velvet. *Alluccionato* is the weaving of small loops of gold thread throughout the velvet pattern, to give the velvet sheen an even more glistening effect.⁵¹ It can be found on the mantle of the anonymous Jew (*Raising of Lazarus*), the mantle of Caspar (*Cleveland Adoration*) and the cloth of honour (*Madonna and Child*) (see Figure 12).

As noted previously, the order of paint application in the gold-brocaded textiles on the *Tree of Jesse* deviates from that on Geertgen's other paintings. In five of the six depicted gold brocades, the highlights that imitate the gold threads were painted *before* the pattern was applied and not *after*. The highlights were painted over the whole textile surface, almost as if a 'plain' cloth of gold – without pattern – was intended and the velvet pattern was applied as an afterthought. This order of application can be seen clearly, even with the naked eye, because the yellow dots and lines that imitate the golden threads are painted in relief and the paint of the pattern that was applied thinly over it has become abraded in many places, revealing the tops of the yellow paint underneath (Figures 14 and 15).



Figure 13 Geertgen tot Sint Jans, *Adoration*: detail of the gold-brocaded red velvet tunic of Balthazar.



Figure 14 Geertgen tot Sint Jans, *Tree of Jesse*: detail of the gold-brocaded black velvet mantle of King David.



Figure 15 Geertgen tot Sint Jans, *Tree of Jesse*: detail of the gold-brocaded polychrome velvet tunic of King Solomon.

This deviating order of paint application is confirmed by the paint sample of the mantle of King David, already described in the previous section (see Figure 11). From this it can be deduced that – in this case at least – the transfer of the pattern to the panel was done at a very late stage of the process. Had it been applied during the underdrawing phase, it would have been illegible by the time the brown underlayers and the densely placed highlights were applied.⁵² This method of paint layer application is very unusual, setting the *Tree of Jesse* well apart from other paintings, not only by Geertgen tot Sint Jans, but also by contemporary artists.

Painting the gold threads

When comparing the various techniques used for the application of the highlights in the different Geertgen paintings, they fall into two groups: the *Tree of Jesse* and the *Holy Kinship* on one hand and the Vienna panels, the *Raising of Lazarus* and the Amsterdam *Adoration* on the other.⁵³ Only the Berlin *Madonna and Child* cannot be placed in any of these groups and is discussed as a separate case at the end of this section. Interestingly, although perhaps not surprising, the two groups coincide with the two groups of the brown underlayer mentioned before. Although the differences in the application of the highlights in both groups are immediately apparent when compared visually, an attempt

to describe them will be made below (compare Figures 8, 9, 10 and 12–17).

The highlights painted on the Vienna panels, the *Raising of Lazarus* and the Amsterdam *Adoration* can be described as somewhat dense in the light areas and more openly structured in the shadow areas. Bright yellow paint has been used extensively in the light areas, while the brushstrokes for the more shaded areas of the fabric are painted with an orange-pink colour. Orange-pink was also chosen for specific parts of the pattern, indicating areas of *massed bouclé*, applying small dots of paint placed closely together (see Figure 16).⁵⁴ The gold-brocaded areas are painted by short, diagonally hatched lines of paint, frequently placed perpendicular over each other to create cross-hatching. The longer lines are often built up from several shorter lines. All this was seemingly done in one session; the cross-hatched strokes sometimes drag the underlying paint along, indicating that these were not yet dry.

The painted highlights in the *Tree of Jesse* and the *Holy Kinship* show a much different technique or 'handwriting'. Its structure is far more dense, leaving relatively little visible of the rosy-brown layer underneath. The build-up of the highlights seems to have been executed in two phases. First, long hatched lines were applied with a diluted paint, creating dull yellow and beige strokes. After drying, the second phase was applied over the first by placing numerous small bright yellow and orange-pink dots after each other, covering the lines of the first phase.⁵⁵ The total effect resembles numerous beaded strings placed side-by-side,



Figure 16 Geertgen tot Sint Jans, *Burning of the Bones*: detail of the gold-brocaded polychrome velvet of Emperor Julian's mantle.



Figure 17 Geertgen tot Sint Jans, *Holy Kinship*: detail of the gold-brocaded polychrome velvet skirt of Saint Elisabeth.



Figure 18 Geertgen tot Sint Jans, *Madonna and Child*: detail of the gold-brocaded green velvet cloth of honour.



Figure 19 Geertgen tot Sint Jans, *Tree of Jesse*: detail of the mantle of King David digitally overlaid with the traced pattern.

creating an ingenious and convincingly glistening effect. Characteristically, in both paintings the creases of the fabric folds are also accentuated with these 'beads-on-a-string'. The overall effect of the highlights in this group is much more playful and free than the highlights from the other group.

As already mentioned there is one exception to the two groups described above: the cloth of honour behind the Virgin on the Berlin *Madonna and Child*. The handwriting of the yellow highlights imitating the gold threads is so different from the other examples that it stands well apart (Figure 18). The difference lies in various aspects: on the *Madonna and Child* the spacing between the highlights is very open and the paint has a different consistency, very dry or lean, giving the lines a broken-up appearance. This is unusual; in other paintings – not only by Geertgen, but also by contemporaries – yellow painted highlights usually have a very smooth and 'buttery' appearance. Lastly, the imitation of *alluciolato* in this painting was executed quite crudely by placing three relatively large dots in a triangle shape for each golden loop. In other paintings, *alluciolato* is imitated more precisely by applying the highlights in small dots, commas or V-shapes.



Figure 20 Geertgen tot Sint Jans, *Tree of Jesse*: detail of the mantle of King Ezekias digitally overlaid with the traced pattern.

Comparing the brocade patterns

In the studies of Cornelisz Engebrechtsz and Jacob Cornelisz, it was found that the painters must have had a set of pattern drawings in their workshop, which they applied flat to their panels. The illusion of foreshortening was created by first shifting the pattern over the larger folds in the fabric, and secondly by reinforcing the shading of the drapery after the application and painting of the pattern.⁵⁶ This was by no means a unique method – it can also be found in paintings from the Southern Netherlands.⁵⁷ Geertgen tot Sint Jans seems to have been no exception to this. As far as can be ascertained from tracings, Geertgen applied his patterns flat, without clear signs of foreshortening, although he shifted them over the larger folds.⁵⁸ But unlike the patterns found on the paintings by Engebrechtsz and Cornelisz – that can be grouped into several basic patterns, most of which were used more than once – the patterns on the Geertgen paintings do not give such clear results.⁵⁹ They show much less coherence even though in many cases the visual language of the pattern demonstrates similarities, especially in smaller details such as the pinecone and corn shapes decorated with a diamond grid. Part of the problem is that



Figure 21 Geertgen tot Sint Jans, *Tree of Jesse*: detail of the tunic and hood of the prophet Isaiah digitally overlaid with the traced pattern.



Figure 22 Geertgen tot Sint Jans, *Holy Kinship*: detail of the skirt of Saint Elisabeth digitally overlaid with the traced pattern.

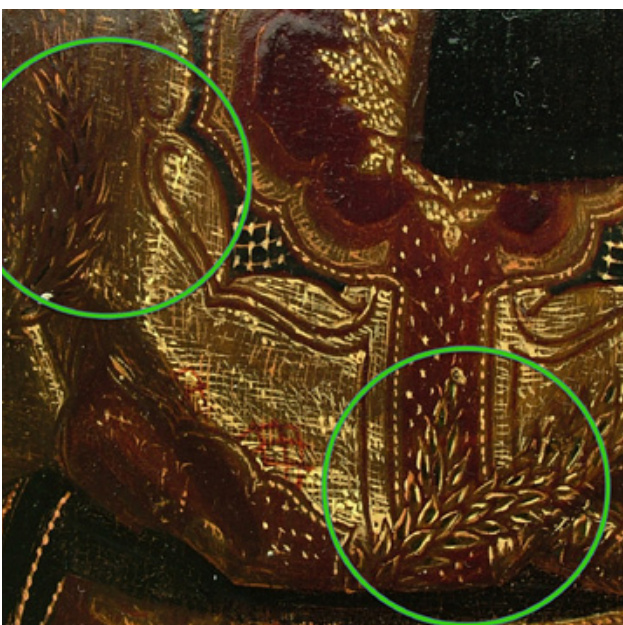


Figure 23 Geertgen tot Sint Jans, *Raising of Lazarus*: detail of the gold-brocaded red velvet mantle of the anonymous Jew with circles marking the elongated shapes covered with small pointed leaves.



Figure 24 Geertgen tot Sint Jans, *Lamentation*: detail of the gold-brocaded black velvet tunic of Nicodemus with a circle marking the elongated shapes covered with small pointed leaves.

Geertgen often used only small parts of a pattern, making it very difficult to compare the different patterns to each other. Only in a few cases can the whole repeat of the pattern be seen or at least guessed at by the available information.⁶⁰

Only on the *Tree of Jesse* do two of the six patterns seem to originate from one basic pattern: the pattern on King David's mantle matches that on King Ezekias' mantle (Figures 19 and 20).⁶¹ Although this does not provide evidence of a connection between different paintings, it does at least prove that patterns could be used more than once. No clear match but several connecting details can be found between the patterns used for both the damask hood and the gold-brocaded green velvet tunic worn by Isaiah on the *Tree of Jesse* and the pattern on the skirt of Saint Elisabeth on the *Holy Kinship* (Figures 21 and 22). The main reason why the match is not definite is that we have too little information for the pattern on Isaiah's clothing. However, it does seem to confirm the previously established relation between the two paintings.

The patterns on the tunics of Caspar on the *Amsterdam Adoration* and of Melchior on the *Winterthur Adoration* also seem to be related.⁶² The most distinctive common detail can be found in the small pinecone shapes circling the larger pomegranate motif. Although both patterns do not provide sufficient information to see or reconstruct the whole repeat of the pattern, the elements found in both clearly recur on the mantle of the anonymous Jew in the *Raising of Lazarus* by the Master of the Tiburtine Sybil (active c. 1475–1495), which does give a complete



Figure 25 Albert van Ouwater, *Raising of Lazarus*, c. 1460–1475, panel, 124 × 92 cm, Staatliche Museen (Gemäldegalerie) Berlin, inv. no. 532A.

view of the repeat.⁶³ This observation strengthens the assumption held by many scholars that the Master of the Tiburtine Sybil worked for part of his career in Haarlem, although the shared use of this pattern hardly clarifies the

connection between him and Geertgen or other Haarlem artists.⁶⁴

A last connection on the basis of the patterns can be made between the Vienna panels and the Paris *Raising of*



Figure 26 Albert van Ouwater, *Raising of Lazarus*: detail of the gold-brocaded brown velvet mantle of the anonymous Jew.



Figure 27 Albert van Ouwater, *Raising of Lazarus*: detail of the gold-brocaded red velvet skirt of Mary Magdalene.

Lazarus. There is a relationship between the brocade pattern on the *Raising of Lazarus* and that on Nicodemus' tunic on the *Vienna Lamentation*, of which only a small part is visible. This relationship is formed by a pattern element: an elongated shape covered with small pointed leaves (Figures 23 and 24). Although there is too little visible of the pattern on Nicodemus' tunic to confirm a positive match between the two patterns in their entirety, the likeness between the two details is striking enough to suggest a link. This connection between the two panels is strengthened by another observation. The man in the right foreground in the *Vienna Burning of the Bones* now wears a plain green mantle with a black scarf-like headdress. But in IRR, underneath part of the black scarf, originally a damask textile was planned, with a pomegranate pattern already drawn or painted in.⁶⁵ This pattern, although only partly visible, seems to be a good match with the pattern of the white damask mantle of one of the bystanders behind Lazarus' coffin on the *Paris Raising of Lazarus*.

Concluding this section, we can say that Geertgen did not systematically reuse his patterns, but sometimes parts of a pattern or smaller details recur within one painting, such as in the *Tree of Jesse*, or in different paintings. A small part of the brocade pattern used on the *Holy Kinship* seems to have been repeated in one of the brocades on the *Tree of Jesse*. Another connection can be made between the Amsterdam and the Winterthur *Adoration*: both contain different parts of a larger pattern, which can be seen in its entirety on the *Raising of Lazarus* by the Master of

the Tiburtine Sybil. Lastly, there are connecting pattern details in Geertgen's *Raising of Lazarus* and his *Vienna Lamentation*; these can be found both in the brocade and in the damask patterns, although the damask pattern on the *Vienna Lamentation* is only visible in IRR.

What about Ouwater? Geertgen tot Sint Jans and his teacher Albert van Ouwater

Van Mander wrote – in his accounts on the lives of both Geertgen tot Sint Jans and Albert van Ouwater – that Ouwater was Geertgen's teacher.⁶⁶ Although generally accepted by scholars, this information is beset by questions on how, when and to what extent this teaching took place, as the career of Albert van Ouwater is shrouded in even more mystery than that of Geertgen himself. We have no idea when or where Ouwater started his working life, although connections to the Southern Netherlands and especially to the studio of Dirk Bouts (1410/1420–1475) are often made based on stylistic grounds.⁶⁷ Van Mander calls him a Haarlem painter, and he is likely to have spent at least part of his working life in this city, during which period he might have been Geertgen's teacher. To complicate matters even further, there is only one painting that – based on Van Mander's descriptions – can be attributed to Ouwater with relative certainty: the *Raising of Lazarus* now in Berlin (Figure 25).⁶⁸ No other painting has ever been convincingly added to this. However, the two gold-brocaded velvets on the *Raising of Lazarus* offer



Figure 28 Dirk Bouts, *The Martyrdom of Saint Erasmus*, c. 1460–1470, panel, 82 x 80.5 cm (central panel), M-Museum/ Schatkamer van Sint Pieter, Leuven: detail of Emperor Diocletian.



Figure 29 Albert van Ouwater, *Raising of Lazarus*: detail of the anonymous Jew.

a possible comparison with Geertgen; they are found on the mantle worn by the anonymous Jew seen on the back and on the lower skirt worn by the standing female on the far left.⁶⁹

Comparing Ouwater to Geertgen tot Sint Jans

When comparing the painting technique of the two gold-brocaded velvets on Ouwater's *Raising of Lazarus* with

those of Geertgen, both interesting similarities and differences can be found. In the gold-brocaded velvets on Ouwater's *Lazarus* neither the underdrawing of the drapery folds nor of the pattern is visible in infrared.⁷⁰ This is something we have seen in most of Geertgen paintings too. The base colour that Ouwater uses as the first paint layer of both brocades is greyish rosy-brown, which interestingly is very similar to the underpaint of the brocades in the *Tree of Jesse* and the *Holy Kinship*.

The pattern that Ouwater used for the skirt of Mary Magdalene is bright red. It does not look much like velvet,



Figure 30 Dirk Bouts, *The Martyrdom of Saint Erasmus*: detail of the gold-brocaded green velvet mantle of Emperor Diocletian.

but the presence of *alluciolato* and the double height of pile in the pattern elements seem to suggest this anyway. Contrary to this, the brown pattern on the mantle of the anonymous Jew clearly does represent velvet.⁷¹ So far in this study, this is the only example where the velvet pattern has been painted with a convincing sheen, the unique play of light upon the velvet pile. The brown paint of the velvet pattern was applied from light to dark, the lighter brown paint being more translucent and the darker more opaque. Painting was executed by carefully blending the layers wet-in-wet, creating smooth transitions. Not only was the sheen painted convincingly, but also the height of the velvet pile, which was painted in more subtle detail than any found on Geertgen's paintings. This was accomplished in two manners. The first was by applying dark brown contour lines along the lighter brown parts of the velvet to suggest the shadows on the gold-brocaded areas, created by the height of the pile. The second was by applying light brown contour lines along the darker brown parts of the velvet to suggest the play of the light upon the edge of the velvet pile (Figure 26).

Another interesting result from this study strengthens the connection between Ouwater's *Raising of Lazarus*, the *Tree of Jesse* and the *Holy Kinship*; the manner in which the highlights have been painted is similar in all three paintings (compare Figures 26 and 27 to Figures 14, 15 and 17). The highlights are densely painted in two overlapping layers: a darker yellow underneath and a brighter yellow on top.⁷² The longer diagonal lines of yellow paint are created – very much the same as on the two Geertgen paintings – by placing many dots after each other, creating the characteristic beads-on-a-string effect. By varying the density of the yellow paint locally the characteristic shimmer of gold-brocaded textile is created. *Massed bouclé* was imitated within parts of the pattern by painting many tilted C-shapes (∩) close together (see Figure 26). In conclusion, it can be said that regarding the build-up of the paint layers, Ouwater's gold-brocaded velvets are closely connected to those on the *Tree of Jesse* and the *Holy Kinship*, but not to the rest of Geertgen's paintings.

However, when looking at the form of the brocade patterns, there is no distinct connection at all between the two patterns on Ouwater's painting and any of the patterns that Geertgen has used, not even when comparing smaller details in the various patterns. The pattern that Ouwater used for the lower skirt of Mary Magdalene is as different from any of the Geertgen patterns as it could be; it is built up from large single elements – a simple cluster of two pomegranates – woven symmetrically over the skirt (see Figure 27). The pattern on the mantle of the Jew is a rather large and massive repeat of undulating pomegranate shapes. In neither pattern has an attempt been made to foreshorten the flat design, other than shifting the pattern over the larger drapery folds. The optical illusion of foreshortening this creates seems to work better for the brown velvet mantle than for the red velvet skirt.

Comparing Ouwater to Dirk Bouts

Recently Kemperdick has argued that the brocades on the Ouwater panel have no close connection to those on Geertgen's paintings, but instead relate much more to some of the early works by Dirk Bouts, especially to the triptych with the *Martyrdom of Saint Erasmus* in Leuven.⁷³ It is certainly true that, even though the anonymous Jew on Ouwater's *Raising of Lazarus* is viewed from the backside and Emperor Diocletian on the middle panel of the *Erasmus* triptych is viewed frontally, the type of ankle-length, fur-trimmed mantle they wear is comparable (Figures 28 and 29). There is also a clear connection to the painting technique used by Bouts. Similar to Ouwater's *Raising of Lazarus* – and therefore also to Geertgen's *Holy Kinship* and *Tree of Jesse* – the brown underlayer of the gold brocades has the typical greyish rosy-brown colour described in the examples. The application of the highlights is also very similar, even though the characteristic beads-on-a-string effect is less frequently applied than in the examples of Ouwater and Geertgen (Figure 30).

There are also marked differences. The layer build-up of Emperor Diocletian's brocade mantle is more complex than that of the anonymous Jew on Ouwater's panel or indeed on any of Geertgen's gold-brocaded velvets.⁷⁴ The patterns used on both paintings also appear to be different. The Ouwater pattern is severe, with a large repeat and bulky areas of brown velvet. The Bouts pattern is much more subtle with a smaller repeat and a more even balance between the green velvet and the gold-brocaded areas. But on closer inspection, some similarities between the two patterns can in fact be found, for example in the outer shape of the pomegranate motifs and in the feather shape below the pomegranates, even though they are clearly not identical (compare Figures 28 and 29).

Within Bouts' oeuvre it does not seem to be uncommon to reuse patterns. When comparing the angel's cope in the *Way to Heaven* and the two cloths of honour in the

Virgin and Child and the *Madonna and Child with Four Angels*, clearly a similar basic pattern has been used.⁷⁵ The larger pomegranate shape and smaller motifs, such as the cluster of three pomegranates and the distinctive maple leaf, are the same in all four cases. However the basic patterns do seem to be adapted to the individual paintings. The motif within the larger pomegranate shape, for example, is different for each painting, adapted by the artist to his – or the commissioner’s – wishes.⁷⁶ In a comparable manner, Ouwater may have used certain elements from Bouts’ patterns to incorporate into his own, just as Geertgen seems to have reused certain details within his own patterns.

Conclusion

Even though in general many aspects of the painting technique of Geertgen’s gold-brocaded velvets do not differ from those used by fellow Northern Netherlandish artists such as Engebrectsz and Jacob Cornelisz, there are some interesting characteristics in the details of execution. Concerning the underdrawing, the Vienna *Lamentation* assumes a special position. While none of the other paintings show an underdrawing of the brocade pattern, and only in some is an indistinct underdrawing of the drapery folds visible in IRR, in the sleeves of Mary Magdalene there is a clear underdrawing for the drapery folds present and possibly also one for the brocade pattern. This would suggest, at least in this case, a careful preparatory phase with the brocade pattern possibly even painted after life.

When considering the paint layers, two groups stand out. The *Holy Kinship* (Amsterdam) and the *Tree of Jesse* (Amsterdam) are painted in a corresponding manner, with a similar tone of rosy-brown underlayer and comparable handwriting in the application of the highlights that imitate the gold thread. Interestingly, this painting technique is very similar to that found in the gold-brocaded velvets on Albert van Ouwater’s *Raising of Lazarus* and also on Dirk Bouts’ *Erasmus* triptych, clearly suggesting a connection between the three masters. The second group is larger and consists of both Vienna panels, the *Raising of Lazarus* (Paris) and the *Adoration* (Amsterdam). The *Madonna and Child* (Berlin) stands somewhat apart from this group, most notably in the different manner of application of the yellow highlights.

Concerning the patterns that Geertgen used for his gold-brocaded velvets, it is clear that even though on the *Tree of Jesse* patterns are reused within one panel, none of his brocade patterns recur on different paintings. However, details of his patterns do repeat on different paintings, suggesting that perhaps he did not use model drawings of complete pattern repeats, but models of smaller pattern elements, which he could combine at will to form a larger pattern. This seems consistent with painters such as Ouwater, Bouts and the Master of the Tiburtine Sybil, who reused larger or smaller pattern elements, but adapted individual details within these patterns to their taste.

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Notes

1. This research has been carried out within the project *The Impact of Oil: A History of Oil Painting in the Low Countries and Its Consequences for the Visual Arts, 1350–1550*. The aim of this project is to write an integrated history of the introduction, dissemination and development of the use of oil media in panel painting from 1350 to 1550 (see also: www.impactofoil.org). The project (end March 2013), is funded by the Netherlands Organization for Scientific Research (NWO) and is directed by Prof. Dr. Jeroen Stumpel and Prof. Dr. Jan Piet Filedt Kok. Van Duijn’s PhD dissertation, *All that Glitters is not Gold – The Depiction of Gold-brocaded Velvets in 15th- and 16th-Century Netherlandish Paintings* is due to be completed in June 2013 at the University of Amsterdam.
2. The term ‘gold-brocaded velvets’ encompasses a wide range of different types of velvets that were brocaded or woven through with gold thread. One of the best books on the subject is L. Monnas, *Merchants, Princes and Painters: Silk Fabrics in Italian and Northern Paintings, 1300–1550*. New Haven and London, Yale University Press, 2008. Monnas explores all types of fourteenth- and fifteenth-century luxurious textiles, both in real life and on paintings. Also very important is Duits’ publication, based on his dissertation, on the costs of these sumptuous textiles and their influence on paintings: R. Duits, *Gold Brocade and Renaissance Painting: A Study in Material Culture*. London, Pindar Press, 2008. For a short overview of the different aspects of gold-brocaded velvets, see also: E. van Duijn and J. Roeders, ‘Gold-brocaded velvets in paintings by Cornelis Engebrectsz’, *Journal of Historians of Netherlandish Art*, 4 (1), 2012, www.jhna.org: 1–13, 1–2.
3. Van Duijn and Roeders 2012: 1–13 (PDF); J.P. Filedt Kok, W. Gibson and Y. Bruinen, *Cornelis Engebrectsz: A Sixteenth-Century Leiden Artist and his Workshop*. Turnhout, Brepols, 2013.
4. T. Van Bueren and M. Faries, ‘The “portraits” in Geertgen tot Sint Jans’ Vienna panels’. In R. Veroughstraete-Marq and R. Van Schoute (eds), *Le dessin sous-jacent dans la peinture, Colloque VIII, 8–10 septembre 1989: Dessin sous-jacent et copies*. Louvain-La-Neuve, Université catholique de Louvain, 1991: 141–9; L. Murphy, ‘The Holy Kinship: a study of workshop practice’, *Bulletin van het Rijksmuseum*, 51, 2003: 126–37; M. Faries, ‘Geertgen tot Sint Jans: continuing

- studies of the painting process', *Simiolus*, 33 (1/2), 2007/2008: 22–32; M. Faries, J.P. Filedt Kok and M. Leeflang, 'De laat-middeleeuwse schilder aan het werk. Hollandse atelierpraktijken in de vijftiende eeuw'. In F. Lammertse and J. Giltaij (eds), *Vroege Hollanders - Schilderkunst van de Late Middeleeuwen*, exh. cat. Rotterdam, Museum Boijmans van Beuningen, 2008: 45–58; M. Faries, 'The Vienna wing panels by Geertgen tot Sint Jans and his drawing and painting technique', *Oud Holland*, 123 (3/4), 2010: 187–219. Recently various conservation treatments have been the starting point for more technical research: A. Wallert, G. Tauber and L. Murphy, *A Medieval Masterpiece: The Holy Kinship by Geertgen tot Sint Jans*. Zwolle, Waanders, 2000; G. Tauber and A. Wallert, 'The Holy Kinship: aspects of attribution'. In H. Veroughstraete-Marcq and R. Van Schoute (eds), *Le dessin sous-jacent et la technologie dans la peinture, Colloque XIII, 15–17 septembre 1999: La peinture et le laboratoire, procédés, méthodologie, applications*. Leuven/ Paris/ Sterling, VA, Uitgeverij Peeters, 2001: 53–62; H. Stege, P. Dietermann and U. Baumer, 'Investigations into the painting materials of the Adoration of the Kings in Winterthur'. In M. Reinhart-Felice (ed.), *Venite Adoremus. Geertgen tot Sint Jans and the Adoration of the Kings*, exh. cat., Oskar Reinhart Collection 'Am Römerholz', Winterthur (Switzerland). Munich, Hirmer Verlag, 2007: 73–87.
5. K. van Mander, *Den grondt der edel vry schilder-const.* Haarlem, Jacob de Meester, 1604: fol. 206r; H. Miedema, *The Lives of the Illustrious Netherlandish and German Painters, from the First Edition of the Schilder-boeck (1603–1604)*, 6 vols, vol. 1. Doornspijk, Davaco, 1994: 82, 83.
 6. Lammertse and Giltaij 2008: 76.
 7. Van Mander 1604: fol. 206r; Miedema 1994: 82, 83; Lammertse and Giltaij 2008: 76 (by Lammertse).
 8. Murphy 2003: 126–37; S. Kemperdick and J. Sander, 'The Winterthur Adoration of the Kings and Geertgen tot Sint Jans'. In Reinhart-Felice 2007: 23–60, 52; Faries 2007/2008: 29, 32; Faries et al. 2008: 53; Faries 2010: 213, 214.
 9. For a dendrochronological overview of all paintings attributed to Geertgen tot Sint Jans or his workshop, see Reinhart-Felice 2007: 90.
 10. *Lamentation of Christ*, c. 1484, panel, 175 × 139 cm, Kunsthistorisches Museum, Vienna, inv. no. GG_991; *Burning of the Bones of Saint John the Baptist* (also called *Fate of the Earthly Remains of Saint John the Baptist*), c. 1484, panel, 172 × 139 cm, Kunsthistorisches Museum, Vienna, inv. no. GG_993. None of the panels attributed to Geertgen tot Sint Jans has been signed or dated. The dates in notes 10, 14 and 15 are taken from the exhibition catalogue *Vroege Hollanders* (Lammertse and Giltaij 2008). They are based on research combining stylistic and art historical data with the most recent technological findings.
 11. Miedema 1994: 82. By that time the rest of the altar had been destroyed and the surviving left wing split into two separate panels.
 12. The author studied both panels *in situ* with the aid of a binocular head loupe (magnification 5.5×). Unfortunately no X-radiographs exist of the panels. Infrared reflectography (IRR) was carried out by Molly Faries and Truus van Bueren in 1988; this material is now at the Netherlands Institute for Art History (RKD) in The Hague.
 13. See for example: J.E. Snyder, 'The early Haarlem school of painting. II. Geertgen tot Sint Jans', *The Art Bulletin*, 42 (2), 1960: 113–32; J.E. Snyder, 'The early Haarlem school of painting, part III: The problem of Geertgen tot Sint Jans and Mostaert', *The Art Bulletin*, 53 (4), 1971: 444–58; A. Châtelet, *Early Dutch Painting: Painting in the Northern Netherlands in the Fifteenth Century*. Lausanne, Montreux Fine Art Publications, 1988: 93–144; Lammertse and Giltaij 2008: 76–125.
 14. *Raising of Lazarus*, c. 1485, panel, 125 × 97 cm, Musée du Louvre, Paris, inv. no. RF 1285; *Adoration* triptych, c. 1485–1490, panel, 111.2 × 69.5 cm (middle panel), 71 × 38.7 cm (left wing), 70.8 × 38.8 cm (right wing), Národní Galerie, Prague (on loan from Správa Prážského Hradu), inv. nos. DO 31 (middle panel) and DO 14/ 15 (wings); *Adoration of the Magi*, c. 1485–1490, panel, 29.3 × 19.9 cm, The Cleveland Museum of Art, Cleveland, inv. no. 1951.353. Lammertse and Giltaij 2008: 82–5, 98–101, 106–9.
 15. *Adoration of the Kings*, c. 1495, panel, 134.5 × 100.9 cm, Collection Oskar Reinhart 'Am Römerholz', Winterthur, inv. no. 1923.1; *Madonna and Child*, c. 1485, panel, 83 × 53.5 cm, Staatliche Museen (Gemäldegalerie), Berlin, inv. no. 1853; *Adoration*, c. 1480–1485, panel, 91.5 × 72 cm, Rijksmuseum, Amsterdam, inv. no. SK-A-2150; *Holy Kinship*, c. 1495, panel, 137.2 × 105.8 cm, Rijksmuseum, Amsterdam, inv. no. SK-A-500; *Tree of Jesse*, c. 1500, panel, 89.8 × 60.6 cm, Rijksmuseum, Amsterdam, inv. no. SK-A-3901. Lammertse and Giltaij 2008: 102–5, 110–20. Obviously, this study only looks at Geertgen's paintings that contain gold-brocaded fabrics. This excludes all of his smaller panels.
 16. On the attribution of the *Tree of Jesse*, see: A. Van Schendel, 'De Boom van Jesse en het probleem van Geertgen tot St. Jans', *Bulletin van het Rijksmuseum*, 5 (3), 1957: 75–83; Snyder 1960: 130; Snyder 1971: 458; Châtelet 1988: 128; Kemperdick and Sander 2007: 54; Lammertse and Giltaij 2008: 119 (by Filedt Kok); Faries 2010: 215.
 17. Apart from the examination of the Vienna panels (see note 12), the Paris, the Prague, the Cleveland and the Berlin panels were studied with magnification (head loupe 5.5×). The three paintings from Amsterdam were studied with the head loupe and with a portable microscope (Zeiss OpMi-1 86372). X-rays and IRRs were available for these three paintings. From the *Tree of Jesse* a paint sample was taken from one of the gold-brocaded areas during the conservation treatment in 2007. IRR assemblies and research reports by Molly Faries have been consulted at the RKD for the Paris *Raising of Lazarus* and both the Prague and Cleveland *Adorations*. The Winterthur *Adoration* was only studied from photographs and literature, which contains much art technological data (Stege et al. 2007: 73–87).
 18. Faries 2007/2008: 32.
 19. Unfortunately contemporary sources are of no help in this study; none mention the painting technique of gold-brocaded textiles, although a few manuscripts and treatises describe various techniques involving gold leaf, such as 'applied brocade' or scrafito. See for example: D. Thompson (trans.), *The Craftman's Handbook "Il Libro dell'Arte" by Cennino d'Andrea Cennini*. New York, Dover Publications, 1960: 86–9; M. Clarke, *Medieval Painters' Materials and Techniques: The Montpellier Liber diversarum arcium*. London, Archetype Publications, 2011: 142; I. Geelen and D. Steyaert, *Imitation and Illusion: Applied Brocade in the Art of the Low Countries in the Fifteenth and Sixteenth Centuries*. Brussels, Royal Institute for Cultural Heritage, 2011: 66–9.
 20. R. Billinge, L. Campbell and J. Dunkerton, 'Methods and materials of Northern European painting in the National Gallery, 1400–1550', *National Gallery Technical Bulletin*, 18, 1997: 6–55, 25–9.
 21. J.R.J. van Asperen de Boer, 'Some observations on underdrawing in Geertgen tot St. Jans paintings', *Akt*, 12 (2), 1988: 49–53; Van Bueren and Faries 1991: 141–9; Wallert et al. 2000: 29–32; Tauber and Wallert 2001: 53–62; Murphy

- 2003: 126–32; Faries et al. 2008: 45–58; Stege et al. 2007: 73–87; Faries 2007/ 2008: 22–32; Faries 2010: 187–219.
22. Faries and Murphy both explain the absence of much (cross-) hatching as an indication of the existence of elaborate preliminary drawings. Murphy 2003: 128–33; Faries 2007/ 2008: 24.
 23. Wallert et al. 2000: 29–32; Faries 2007/ 2008: 24–8; Faries 2010: 190–202. Although the application of a dry medium to sketch in the background is found on several Geertgen panels, the use of a dry medium as a corrective phase has only been found on the Vienna panels and the Prague *Adoration*.
 24. Van Duijn and Roeders 2012: 4 (PDF).
 25. Infrared reflectography by Molly Faries (on both Vienna panels, Cleveland *Adoration* and Prague *Adoration*) was performed with a Grundig 70 H television camera outfitted with a Hamamatsu N 214 IR vidicon (1981), a TV macro-mar 1:2.8/36mm lens, and Kodak wratten 87 A filter cutting on at 0.9 µm placed behind the lens, with a Grundig BG 12 monitor set at 875 lines. Any photographic documentation is done with a Canon A-1 35 mm camera, a 50 mm macrolens, and Kodak Plus X film and/or Ilford film, ASA 125. Infrared reflectography on the three Rijksmuseum panels (on the *Tree of Jesse* IRR RKD.G337, the *Holy Kinship* IRR RKD.G339 and the *Adoration* IRR RKD.G 338), carried out by the RKD, was performed with a Hamamatsu C 2400-07 equipped with a N2606 IR vidicon, a Nikon Micro-Nikkor 1:2.8/55 mm lens, a Heliopan RG 850 (or RG 1000) filter, with a Lucius & Baer VM 1710 monitor (625 lines). Digitised documentation is done with a Meteor RCB framegrabber, 768 × 574 pixels, color-vision toolkit (Visualbasic). The IRR assemblies reproduced in this article were made with PanaVue ImageAssembler and Adobe Photoshop.
 26. In the case of the Prague *Adoration*, IRR monitoring of the gold-brocaded clothing of the kings was only documented in a small area of the mantle of Caspar, the part surrounding the vessel held by Melchior. However, written observations by Faries confirm that none of these areas is penetrated by IRR, showing neither an underdrawing of the drapery contours nor the folds or the pattern. IRR archive of Molly Faries at the RKD, number 2164.
 27. IRR archive of Molly Faries, RKD, number 1468.
 28. Stege et al. 2007: 74.
 29. See note 12. Of the gold-brocaded mantle of King Julian in the *Burning of the Bones* and the tunic of Nicodemus in the *Lamentation* only small fragments of IRR have been documented, both too small to determine whether contours and folds have been underdrawn. Although Faries and Van Bueren looked at larger areas with IRR on both panels, they mostly documented the faces and hands of the many figures in the paintings. In their personal notes Van Bueren and Faries described the mantle of Julian as having ‘only fine cross-hatching in one place’ (*alleen op 1 plaats hele fijne arcering*). IRR archive of Molly Faries, RKD, number 224. The identification of the sorrowing female in the left foreground of the Vienna *Lamentation* has been debated; different authors identify her as Mary Cleophas, Mary Solomon or Mary Magdalene. See Faries (2010: 298, 216) for a short overview of this discussion. In 1991, Van Bueren and Faries identified the standing female on the right side as Mary Magdalene, as she wears ‘the richest and most luxurious outfit’ (Van Bueren and Faries 1991: 143). It is for exactly this reason that we believe the female on the left to be Mary Magdalene; the gold-brocaded sleeves are a symbol of luxury.
 30. Jan van Eyck, *Madonna and Child with Canon Joris van der Paele*, 1436, panel, 124.5 × 160 cm, Groeningemuseum, Brugge, inv. no. 0.161.I; Jacob Cornelisz van Oostanen, triptych with the *Adoration of the Kings*, 1517, panel, 84.1 × 55.2 cm (middle panel) and 82.2 × 23.6 cm (each wing), Rijksmuseum, Amsterdam, inv. no. SK-A-4706. No other early Netherlandish examples are known to us from literature.
 31. Monnas 2008: 30, 121.
 32. E. Van Duijn, ‘Gold-brocaded velvets in paintings by Jan van Eyck’. In *Van Eyck Studies. Proceedings of the XVIII Symposium for the Study of Underdrawing and Technology in Painting, Brussels 19–21 September 2012*, forthcoming 2014.
 33. E. Van Duijn, *Gold-brocaded Fabrics in Paintings by Cornelis Engebrectsz and Jacob Cornelisz van Oostanen: A Study into their Painting Technique and use of Brocade Patterns*, PhD pilot study (unpublished), 2009: 20–29.
 34. The Winterthur *Adoration* was not taken into account for this part of the study.
 35. The sample (Rijksmuseum no. 170/2) was taken by Arie Wallert (senior scientist, Rijksmuseum Amsterdam) during the conservation treatment of the painting by Willem de Ridder (paintings conservator, Rijksmuseum Amsterdam) prior to the *Vroege Hollanders* exhibition in the spring of 2008. It was examined for this article with a Leica DMLM microscope (at magnifications of 50×, 100×, 200×, 500× and 1000×) in direct incident light (bright field), and ultraviolet light (filter cube BL/VIO C105). Images have been recorded using a digital Leica DFC 420 C camera.
 36. This layer was analysed by Arie Wallert for a forthcoming publication on the conservation and painting techniques of the early Dutch paintings from the Rijksmuseum.
 37. The combined evidence of the thinness of layer 3 and the presence of black pigment particles suggests that the invisibility of the underdrawing discussed in the previous section is due more to carbon-containing paint rather than to the thickness of paint layers.
 38. For this study, Arie Wallert helped with energy dispersive micro X-ray fluorescence analyses. XRF is an analytical technique that measures the chemical elements in parts of a paint sample. This technique was available to the *Impact of Oil* project and proved a very useful addition to polarised light microscopy (PLM). Technical specifications of the XRF spectrometer are: Bruker Artax µ-XRF spectrometer, 40 kV, 500 µA, 60 sec., Mo-anode, 0.090 µm capillary lens, Helium flush (1.7 L/min), over 50 keV energy range.
 39. The use of synthetic pigments such as vermilion and an organic red pigment for the lower brown layer (layer 3 in the sample), instead of using cheaper earth pigments, is a technique that has also been found in paintings by other artists, such as Bouts and Engebrectsz. These pigments give a brighter tone than most earth colours. C. Périer-d’Ieteren, *Dieric Bouts: The Complete Works*. Brussels, Mercatorfonds, 2006: 101; Van Duijn and Roeders 2012: 4 (PDF).
 40. B. Devolder, ‘The representation of brocaded silks and velvets in fifteenth and early sixteenth century Netherlandish paintings: methods and materials’. In H.M. Parkin (ed.), *AIC Paintings Specialty Group Postprints 21*. Washington, DC, AIC Publications, 2009: 61–72, 68–70.
 41. Van Duijn and Roeders 2012: 4 (PDF); Van Duijn 2009: 21–4.
 42. Devolder 2009: 68–70.
 43. Pers. comm.
 44. This method was used in a reconstruction of a part of a gold-brocaded velvet by Cornelis Engebrectsz and was very successful.
 45. Faries and Murphy both concluded that Geertgen must have used detailed model drawings next to his painting. These may also have contained precise information on the patterns and

- may partly explain the absence of evidence for a preparation of the patterns. See also note 22.
46. Monnas 2008: 24–5; P. Bensi, 'Aspects of dyeing techniques and materials in Italy during the 15th and early 16th century'. In C. Buss (ed.), *Silk Gold Crimson: Secrets and Technology at the Visconti and Sforza Courts*. Milan, Silvana Editoriale, 2009: 37–41.
 47. On the key position of Saint Elisabeth in the *Holy Kinship*, see: Lammertse and Giltaij 2008: 112 (by Leeftang); Wallert et al. 2000: 23.
 48. Geertgen does not seem to have tried to imitate the characteristic sheen of velvet in his patterns, or in any other type of textile for that matter. At the end of the fifteenth and during the early sixteenth century, creating velvet sheen had often become a sort of trick, for which highlighted and shaded areas would be reversed. This can be seen in many Netherlandish paintings from the period, for example in those by Engebrechtsz; see Van Duijn and Roeders 2012: 6 (PDF).
 49. W. Wailliez, 'Lampas, velvet and cloth of gold: criteria for interpreting the representation of textiles by applied brocade'. In Geelen and Steyart 2011: 141–9, 147; Monnas 2008: 191.
 50. Weaving velvets in different heights of pile was a complex technique that would add to the overall expense of the already costly fabric. To create a double height of pile, the thin rods that were inserted on the loom for the weaving of velvet would have to be used in two heights. For a more detailed description on the complexities of velvet weaving, see: De Marinis 1994: 26–8, 184; Monnas 2008: 23–4, 298–301.
 51. F. De Marinis, *Velvet: History, Techniques, Fashions*. Milan, Idea Books, 1994: 189; Monnas 2008: 301, 303.
 52. Arie Wallert reached the same conclusion in his poster about the painting technique of the *Tree of Jesse* for the scholar's day on *Early Netherlandish Art* on 29 April 2008.
 53. For this section only the paintings that were both studied from life and photographed in detail have been taken into account.
 54. *Massed bouclé* is a technique in which the gold thread is woven in small loops, but is densely packed and not as far apart as in *alluciolato*. From a distance this would create a difference in texture and in the overall colour of the reflected gold. See also Monnas 2008: 53, 111.
 55. The yellow paint on the *Tree of Jesse* was identified as lead-tin yellow in sample 170/2. See also under 'Painting the first layers'. Lead-tin yellow was one of the few yellow pigments available and its handling properties and bright colour would lend itself well to the type of detailed brushstrokes needed for this type of work.
 56. Van Duijn and Roeders 2012: 5, 6, 8–10 (PDF); Van Duijn 2009: 9.
 57. See for example: S.H. Goddard, 'Brocade patterns in the shop of the master of Frankfurt: an accessory to stylistic analysis', *The Art Bulletin*, 67 (3), 1985: 403; C. Périer-d'Ieteren, *Colyn de Coter et la technique picturale des peintres flamands du XV^e Siècle*. Brussels, Lefebvre & Gillet, 1985.
 58. For the purpose of studying the patterns, tracings were made by placing a sheet of Melinex plastic over the painting and then tracing the pattern with a soft-tipped marker. This allows for a 1:1 examination of the patterns without the interference of drapery folds or colour. Tracings were made of the Vienna panels and the three Amsterdam panels (*Holy Kinship*, *Adoration* and *Tree of Jesse*). Of the other patterns, tracings were made after (high resolution) photographs printed at 1:1. These tracings are of course less precise because photographs are often slightly distorted towards the edges. It is also difficult, if not impossible, to accurately judge the existence of non-original paint layers from photographs. But with these caveats in mind, these tracings were still useful for comparison.
 59. Van Duijn and Roeders 2012: 8–10 (PDF); Van Duijn 2009: 27–9.
 60. These are the patterns on the mantle of Emperor Julian (*Burning of the Bones of Saint John*, Vienna), the tunic of King Balthasar (*Adoration*, Amsterdam), the mantle of the anonymous man (*Raising of Lazarus*, Paris), the robe of King Melchior (*Adoration*, Prague) and the skirt of Saint Elisabeth (*Holy Kinship*, Amsterdam). Although the latter is very damaged, large areas of the original pattern still remain. Of the pattern of the cloth of honour in the *Madonna and Child* (Berlin) and both patterns on the mantles of King Caspar on both *Adorations* in Prague and Cleveland, the main motif is mostly visible, but the complete repeat is not.
 61. The other four patterns in the painting are all different from each other.
 62. The Winterhur figure of Melchior is clearly based upon Nicodemus in the Vienna panels, as has been argued convincingly by Kemperdick and Sanders (2007: 44–5). In this adaptation however, the brocade pattern from Nicodemus' tunic was not included; it was replaced by a different one.
 63. Master of the Tiburtine Sybil, *Raising of Lazarus*, c. 1480–1486, panel, c. 79 × 37 cm, Museo Nacional de San Carlos, Mexico City, inventory no. 41. The RKD in The Hague holds a high quality b/w photo, which clearly shows the entire pattern. RKD: ONS/Groep 500 – Historie. Kunstwerknr. 19112, afbeeldingnr. 0000140922.
 64. For literature on the Master of the Tiburtine Sybil, see J.E. Snyder, 'The early Haarlem school of painting. I. Ouwater and the Master of the Tiburtine Sibyl', *The Art Bulletin*, 42 (1), 1960: 39–55; Châtelet 1988: 140–43; Lammertse and Friso 2008: 67–9 (by Lammertse).
 65. Interestingly, only a small part of the black scarf can be penetrated by IRR, perhaps due to obscuring underlayers of paint that are invisible to the eye.
 66. Van Mander 1604 (fols 205v and 206r); Miedema 1994: 81–3.
 67. Snyder 1960: 43, 44; Châtelet 1988: 90; Lammertse and Giltaij 2008: 63 (by Lammertse); A. Châtelet, 'Early Dutch painting: thirty years on', *Oud Holland*, 123 (3/4), 2010: 314–29, 321.
 68. S. Kemperdick, 'Albert van Ouwater: the *Raising of Lazarus*', *Oud Holland*, 123 (3/4), 2010: 235–50, 235–8; Lammertse and Giltaij 2008: 63. Van Mander admits to not having seen the painting in real life – only a grisaille copy of it – but the Berlin *Raising of Lazarus* fits Van Mander's description well. Albert van Ouwater, *Raising of Lazarus*, c. 1460–1475, panel, 124 × 92 cm, Staatliches Museen (Gemäldegalerie), Berlin, inv. no. 532A.
 69. Kemperdick identifies this figure as Martha, but we feel that – as in the case of Mary Magdalene on Geertgen's *Lamentation* – this woman should also be identified as Mary Magdalene on account of her sumptuous and costly gold-brocaded red velvet skirt. See also note 29.
 70. The *Raising of Lazarus* by Ouwater was examined for this study in Berlin in 2009, together with the available X-rays and infrared photographs. In the IR photographs, the paint layers of the gold-brocaded velvets could not be penetrated by infrared. For his article Kemperdick used IRR recorded after 2009, leading to the same conclusion. Kemperdick 2010: 241.
 71. Brown is a somewhat unusual colour for fifteenth-century depictions of gold-brocaded velvets, but certainly not unheard of – it was used on the angel's cope in Rogier van der Weyden's *Annunciation* (Musée du Louvre, Paris) and on the mantle of the organ-playing angel on Van Eyck's *Ghent Altarpiece*

- (Saint Bavo, Ghent). The brown paint on Ouwater's painting does not seem to be a discoloured copper-based green (Beatrix Graf, paintings conservator, Berlin Gemäldegalerie, pers. comm., 19 January 2009).
72. The two artists differ in that unlike Geertgen, Ouwater does not use pink-orange paint for the highlights in the more shaded areas.
73. Kemperdick 2010: 246, 247. As stated by Kemperdick these observations were first made by Matthias Weniger. M. Weniger, 'Überwunden, unverantwortlich? Fragen zur Eigenhändigkeit bei Bouts und Ouwater'. In B. Cardon, M. Smeyers, R. Van Schoute and H. Veroughstraete (eds), *Bouts Studies. Proceedings of the International Colloquium, Leuven 26–28 November 1998*. Leuven/ Paris/ Sterling, VA, Uitgeverij Peeters, 2001: 223–42, 227–8. Dirk Bouts, triptych with the *Martyrdom of Saint Erasmus*, c. 1460–1470, originally panel, 81.5 × 80.5 cm (middle panel), 81.5 × 34.2 cm (wings), M-Museum/ Schatkamer van Sint Pieter, Leuven.
74. The rosy-brown underlayer is in fact not the first paint layer applied. Underneath it is an earlier phase of warm brown paint. Over this phase, a first layer of the green pattern has been applied. Only after the application of this pattern was the rosy-brown layer painted between the pattern elements. After that the pattern was worked out in a detailed manner to imitate the sheen of the velvet and the height of the velvet pile. Lastly the yellow highlights were applied.
75. Dirk Bouts, *The Way to Paradise*, c. 1470, panel, 115 × 69.5 cm, Palais des Beaux-Arts de Lille, Lille, inv. no. P820; Dirk Bouts, *Virgin and Child*, c. 1465, panel, 37.1 × 27.6 cm, National Gallery, London, inv. no. NG2595; Dirk Bouts, *Virgin and Child and Four Angels*, before 1469, panel, 53.8 × 38.8 cm (including frame), Capilla Real, Granada, inv. no. 14. The reuse of patterns can already be observed by comparing the high-quality photos from the Bouts monograph by Périer d'Ieteren (2006: 88, 135, 140). Although admittedly this is not the most scientific of methods, it sufficed for this purpose. The patterns are very clearly outlined and apart from *The Way to Heaven*, no drapery folds interfere with the visible pattern repeat. It was even found that the same pattern is visible on the *Virgin and Child* attributed to the workshop of Dirk Bouts (Metropolitan Museum of Art, New York, acc. no. 49.7.18) and more than once on the triptych with the *Assumption of Mary* by Dirk's son Albrecht Bouts (Royal Museum, Brussels, inv. no. 574). Clearly, the pattern was inherited by the son after the death of his father.
76. This method of adapting a pattern has also been found by the author in the following paintings by the Master of the Tiburtine Sibyl: *Prophecy of the Sibyl of Tibur* (c. 1470, panel, 68.9 × 85.7 cm, Städel Museum Frankfurt, inv. no. 1068), *Marriage of the Virgin* (c. 1475–95, panel, 144.8 × 102.9 cm, Philadelphia Museum of Art, inv. no. 344) and *Crucifixion* (c. 1485, panel, 143.7 × 102.6 cm, Detroit Institute of Arts, inv. no. 41.126).

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