The Adoration of the Magi

Workshop of Hieronymus Bosch
c. 1495–1520

Oil (not analysed) on oak (analysed) panel, 77.5 × 56.2 cm
Philadelphia Museum of Art, John G. Johnson Collection, 1321

The painting was restored in 2014–15, thus after the 2012 BRCP examination of the painting on which this text is largely based.

BRCP, *Catalogue Raisonné*, cat. 25; www.boschproject.org no. 25.

Inscriptions and labels
Reverse: the inventory number, 1321, is written twice on a vertical cradle member. Frame reverse, top right: a number 3[...?]54 inscribed in pencil.

SUMMARY OF CONCLUSIONS

The Adoration of the Magi *in Philadelphia can be placed within the Bosch workshop. The style of the phased underdrawing fits well with that found in other works. Although a judgement of the painting technique is hindered by the poor condition of the paint layers, it appears that Hieronymus had little if any direct involvement in the painting process. The panel was originally housed in an engaged frame, now lost. The bottom of the panel was cropped slightly. Dendrochronology indicates that it could have been painted from 1493 onwards, although a date after 1495 is statistically more probable. As further explained in* BRCP, Catalogue Raisonné, *cat. 25, we date this work to around 1495–1520.*

EXAMINATION DATA

18–19 April 2012 (Luuk Hoogstede, Matthijs Ilsink, Rik Klein Gotink, Jos Koldeweij, Ron Spronk).

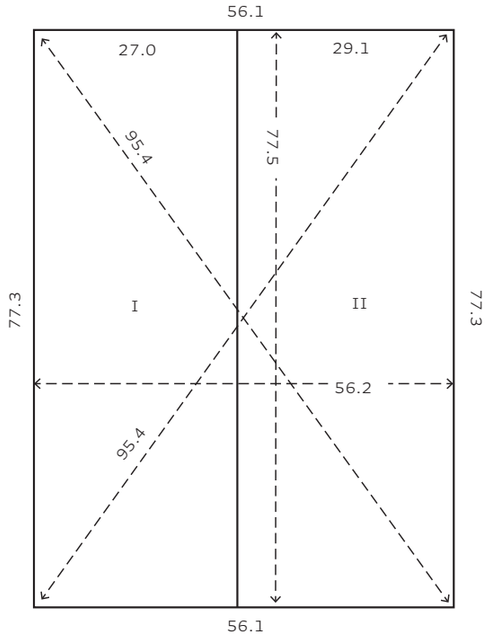
The panel was examined out of its frame in a conservation studio. It was studied upright on a cart and an easel, and flat on a table under strong illumination. Both front and reverse were easily accessible.

- ***Previous research and additional documentation available*** The museum's documentation on the painting includes: a photo of an XR detail probably made in 1936; the dendrochronology report from 1987; brief examination and treatment notes; and excerpts of literature discussing the painting.
- ***Previous treatments*** In 1941 David Rosen removed varnish and overpaints and retouched, varnished and waxed the painting. In 1958 restorer Ted Siegl noted that the painting had been previously cradled and extensively retouched. He impregnated four new blisters in the green robe with wax and applied a surface coating.[1] In 1962, Siegl noted issues of raised paint, especially in the lower section of the panel, and a few very small losses. He faced the entire surface with wax, removed excess and surface dirt, inpainted losses and varnished.[2] Notes dated 1979, 1984 and 1988 on a condition sheet state the poor appearance of the painting (with abrasion, losses and discoloured inpaintings and varnish) and its stability (noting the vertical crack and a convex warp).

SUPPORT

- ***Panel*** Dimensions: see construction diagram (fig. 25.1).
Thickness: (max.) c. 1.2 cm; c. 0.3–0.4 cm along the edges; including cradle, c. 3.7 cm.

The wood species, Baltic oak, was identified through dendrochronology. The panel consists of two quarter-sawn planks, vertical



25.1 Construction diagram (seen from the front)



RR 58



RR 57







25.3 IRR

25.2 VIS

in grain, laid vertically. The two planks are connected in a V-shaped tongue-and-groove join and glued.[3] Dowels were not detected.

The panel reverse is not original, as it has been thinned and cradled. The reverse is toned or painted brown.

- ***Bevelling or half-lap edges*** The left, top and right edges of the panel reverse were worked to a half-lap edge. At these outer edges, the panel is approximately 0.3–0.4 cm thick. The bottom edge was cropped (see below, *Altered dimensions*).
- ***Dendrochronology*** The youngest heartwood ring dates from 1482, which, with the added minimum of nine sapwood rings for Baltic oak, implies an earliest possible felling date of 1491 for the tree that produced the wood for that plank.[4] An earliest felling date of 1493 is statistically more probable, however, since that would cover 93 per cent of the range of possibly missing sapwood rings. Assuming at least two more years for drying and transportation, the panel could have been produced from 1493 onwards, but a production date from 1495 onwards is statistically more probable.

GROUND

- ***Visibility*** The off-white to cream-coloured ground (not analysed) is present overall. The paint layers mostly cover the ground layer. Locally the ground can be detected in VIS at paint contours, along panel edges, and in losses, abraded areas and open craquelure. Discernibility of the ground tone shimmering through slightly in places could have been intended as part of the composition. Nevertheless, the ageing of paint layers has likely increased their transparency, and thus the visibility of the underlying layers. In the sky area, a combination of these factors appears to have resulted in the visibility of the ground.
- ***Barb and edges*** Barbs and ungrounded and unpainted edges have been largely preserved on the left, top and right sides of the panel, but not at the cropped bottom (see below, *Altered dimensions*). The unpainted edges are about 0.9–1.0 cm wide. As the presence of barbs and ungrounded edges indicates, the painting originally had an engaged frame.
- ***Application*** The ground appears to have been applied somewhat thickly and evenly, using a brush. The strokes are slightly visible (e.g. above Mary's shoulder), but currently the surface structure of the wooden support is also apparent.

PREPARATORY LAYERS

- ***Underdrawing*** Underdrawing shimmers through the paint surface in VIS in many areas and is discernible where paint is damaged, as well as at some paint contours (e.g. above the Christ Child's left eye; figs. 25.4–5). The current visibility (in normal light) of the underdrawing in light areas is likely caused by the changes in refractive index due to the ageing of the paint film, which result in increased transparency. IRP and IRR revealed underdrawing beneath paints more clearly, although the crackle pattern and carbon-containing paints used in dark areas (e.g. the middleground and parts of the stable) obscured it somewhat.

  The composition is extensively underdrawn, especially the main figures, but only a few dabs of underdrawing were observed in the fore- and background landscape. Underdrawing not only indicated the contours of the main composition, the folds of clothing, and detailing of hands and facial features, but aided in modelling as well, via parallel and cross-hatching for shadowed areas and architecture. It appears that hatchings in the green and red mantles also indicated those zones where little to no lead-white-based underpainting was to be applied and more glaze was needed.



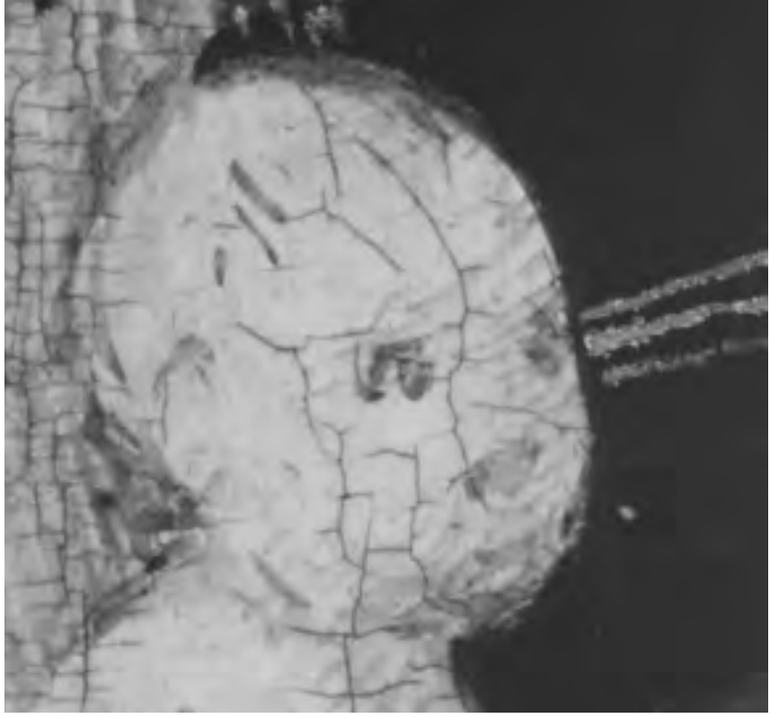
25.4–5 VIS and IRP

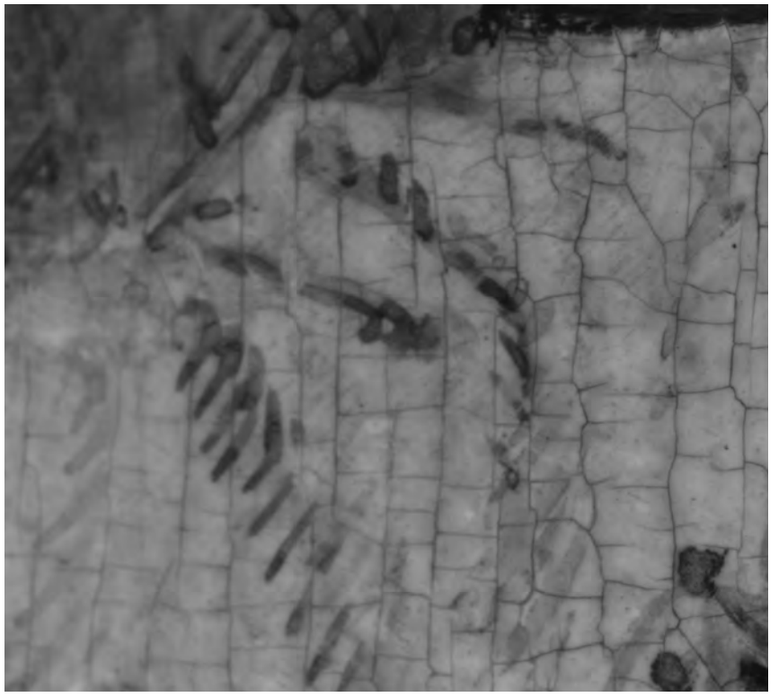


25.6–7 VIS and IRR macro

- ***Medium and application*** The detectable underdrawing was applied with a brush and apparently consists of at least two types of liquid medium. One was very black and highly fluid and could be a finely ground carbon black in a watery medium, as particles are discernible (fig. 25.6). The prevalent underdrawing is often more faint, possibly using ink, as many lines are relatively even. In other areas the distinction between the media is less evident.

  Underdrawing appears to have been applied in at least three stages. First, in the watery black medium, the main contours of figures, folds and the architecture seem to have been indicated using medium-sized brushes. Possibly during that stage also some facial features were roughly indicated in short dabs, as well as some hatchings (e.g. in the Christ Child). In the next stage, perhaps using ink, the artist further developed the composition. Additional contour lines and extensive hatching, done with smaller





brushes, were used to model the faces as well as the robes. In the final stage, medium-sized brushes and the watery black medium were employed once again. Many of the shadows were reinforced, in some places extensively, as in Mary's robe at her left hand; in other areas shadows were corrected, as in certain folds in the robe covering Joseph's proper left arm. It may have been at this time, too, that the cross-hatching was applied in Mary's robe. It is unclear in what phase the shadows in the stable (e.g. above the ox and ass) were indicated. Those lines are unusually broad but do appear distinct from the painting phase. Similarly broad lines were detected in the magus's red robe at bottom right.

- ***Style*** The underdrawing is highly extensive and fairly detailed. There appears to be a distinction between the faint hatching, which seems more controlled and precise, and the dark hatching, which looks rougher and more freely applied, although the difference in medium also plays a role in this. Underdrawing was applied in a variety of ways, generally using small- to medium-sized brushes; only locally were broad brushstrokes observed. The initial drawing appears rough, with free strokes quickly indicating the main elements of the composition. The hatched lines of this stage and that of the final one are often very short and dark, compared to the longer faint lines of the intermediate stage, which are also more regularly spaced. Hatching is done mainly in diagonal lines slanting left or right, or in both directions in areas of cross-hatching. Overlaps are only visible at the broad lines and at the lines of the final stage, mainly in darker areas. The strokes applied in the watery black medium are sometimes irregularly shaped. The fainter hatched lines are fairly straight to slightly curved, with straight and mostly blunt or tipped line ends.
- ***Revisions in underdrawing and differences from painting stage(s)*** It seems that local revisions were made in the final underdrawing stage, as in some folds of the robe covering Joseph's proper left arm and in the robe of the kneeling magus. The underdrawing was closely followed in the paint application phase. Apparently only the red robe of the magus was painted slightly differently at the bottom and the black hat of the shepherd was underdrawn taller.
- ***Intermediate layers*** A possible isolating layer was observed at the edges of paint losses in the back of the black magus (57MICGBM003).

PAINT LAYERS

- ***Paint application and painting technique*** The oil paint (not analysed)[5] was applied with a brush up to the barbs and the bottom edge of the panel. The underlying preparatory layers are sometimes visible at the interfaces between different colours. Paint was applied in several stages, mostly wet-on-dry, but also wet-in-wet. Incisions were noted at the right edge of the roof where it connects to the stable extension (see below, *Build-up and palette*). Several other incisions or scratches, some of which are quite long, were observed. These are mainly located in the sky area, and unrelated to the composition.

  The paint application closely followed the underdrawing. Both thick and somewhat thin paint applications were observed, the thickness often depending on the pigment used (e.g. lead-white paints generally being more impastoed). In several areas, the paint consistency is slightly coarser (see below, *Texture*). The face of Mary is modelled with a light area and a shadow on a pinkish midtone. In the red-robed magus, however, a highlight is not present in his face, which was modelled with slightly browner pink patches. Generally, fluid and glossy paints were laid on in opaque as well as semi-transparent layers. Brushstrokes of stiffer paint are present in the lead-white-based undermodelling of green and red robes, followed by glazes. In multiple areas the artist painted wet-in-wet, as is visible in the lead-white detailing blending with the red lake paint of the black magus's shoes.

  The composition was worked out to a fairly high degree of finish. The artist painted fairly precisely, although brushstrokes were generally of medium rather than very fine size. Strokes were used to render contour and volume throughout the painting, as in the meandering pleat reinforced by the dark green glazes of the garment's folds on the upper leg of the kneeling magus (figs. 25.6–7). The glaze areas here were further strengthened by dark hatching of the final underdrawing stage, which also indicated where little to no lead-white-based undermodelling was to be applied. Although light brown to pinkish shadow lines were used (e.g. in the fingers), dark brown or black contour lines to indicate physiognomic detailing were not observed. The detailing with gold leaf was adhered onto a yellowish- to reddish-brown mordant applied with a brush in impastoed lines or dots.

- ***Texture*** Most passages were worked into a relatively smooth finish, but fine brushstrokes are frequently visible. The use of thicker lead-white-bearing paints for the undermodelling of robes and lead-tin yellow for detailing and highlights has resulted in many impastoed areas. Such areas of undermodelling also have more defined brushstrokes. Flesh-tone paints are often slightly impastoed as well; for example, in the face of the red-robed magus. Here the paint also has a slightly granular appearance, as in Mary's face and hair.
- ***Build-up and palette*** The paint was applied mostly from light to dark. Dark-to-light application is evident where a darker base paint preceded lighter touches of detailing and highlights. The paint application was largely planned. It seems to have been executed 'back-to-front' only, leaving areas in reserve.

  For the paint of the sky, gradually less lead white and more azurite pigment was mixed in towards the top of the panel. Although the entire sky is heavily abraded, roughly three differently coloured horizontal bands are still distinguishable there. The brown base paint of the roof was applied after the sky was painted, but before the incisions at right were made. The green landscape paint overlapped these incisions and was followed by darker brown paint that reinforced the contour of the roof. The more impastoed lead-white-bearing highlights near the top of the thatched roof were applied before the final brown paint there. The grey wall of the stable was also painted before the green of the landscape, which appears to have a yellow-brown base. The top part of the landscape overlaps the light paint of the sky. The large tree in the right background was not left in reserve but painted atop the green landscape and the bluish sky. The tree trunk at the centre right edge was also painted on top of the landscape, and the tree at the bottom left of the panel was painted atop the wall.

  The figures were first left in reserve from a lighter brown base colour (perhaps similar to the yellow-brown base of the landscape), and then the robes were depicted, followed by dark grey or brown paint of the foreground and middleground landscape, which overlapped them. The faces were painted afterwards. Mary's face was modelled with a midtone area in pink, areas of highlight in pink with more lead white (especially at the cheekbone), and more purplish shadows containing red lake and black pigments. Mary's hair was then applied, with pink and lead-tin yellow highlights on a red-brown base. Joseph's beard overlapped the brown and dark grey paint there.

  The green robe has a lead-white-based undermodelling that may contain some green pigments as well. A generally thin green layer and a thicker green glaze for shadows followed it. Finally, local whitish highlights and dark green paints were applied, reinforcing the modelling (see e.g. in the dark green opening in the sleeve of the kneeling king, under his left arm, fig. 25.8). The blue belt and the black purse were left in reserve from the green robe, although the former was altered (see below, *Changes*). The black belt of the red-robed magus at right was not left in reserve. At the bottom of this robe, a lining in white-grey was painted onto the red lake. All red robes have lead-white-bearing undermodelling, followed by red lake. Red lake was also observed in some shadows in the back of the black magus (where it was mixed with carbon black, as indicated by IRR/IRP) and in the dark background behind him.

  The turban of the black magus was first underdrawn and then left in reserve from the grey background. The headgear was next painted in lead white, followed by wet-in-wet-applied blue paint mixed with some carbon black for the darkest parts. The orangeish- to reddish-brown mordant and the gold for the crown were applied afterwards. For the gold detailing on his robe, a more yellowish-brown mordant was used. It was also applied to create some gold highlights in the scene on his sleeve with the monochromatic pinkish figures catching and collecting the manna from heaven, which itself was represented by small, impastoed lead-white-based dots of paint (fig. 25.10). The gilded detailing on the large gift of the black magus has an orange-to-red base, followed by lead-tin yellow, yellow-brown mordant, gold leaf and a red lake glaze (see e.g. in its right pinnacle, fig. 25.9). A fairly similar build-up is found on the sword handle and fittings. The black sheath of the sword was decorated with hardly visible short, deep black strokes. Perhaps the subtlest detail is formed by four only slightly darker red circles in two strips of clothing adjacent to the table, extending from the shoulder of the red-robed magus. The upper two circles are underdrawn.
- ***Changes*** Minor changes were noted in the painting. The left window in the thatched roof was somewhat altered. The proper right ear of the cow appears to have been painted out. The angle of the extending wall at centre right was reduced at the top. The wall in the bottom right and the small, extending section at bottom left were painted over the brown landscape. The blue belt of the kneeling magus was initially black, with left-pointing chevrons in red lake paint. Since these features remain relatively transparent in IRR/IRP, they were probably painted wet-in-wet.

FRAME

The original, engaged frame has been lost. The modern wooden frame (90.0 × 69.0 cm; thickness c. 5.5 cm) is profiled and water-gilded. Small, gilded rosettes were applied to its faces, except the bottom, which has a *Wasserschlag* or 'rainsill' bevel.

CONDITION

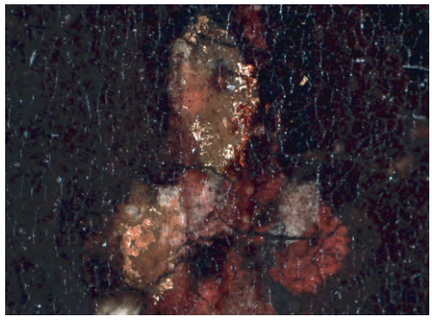
The painting was restored in 2014–15, thus after the 2012 BRCP examination of the painting on which this text is largely based.

Support

- ***Altered dimensions*** The bottom edge of the panel was cropped, removing the original unpainted and ungrounded panel edge there. Some of the wood is missing from the panel edge elsewhere as well, especially at the upper right. The panel reverse was considerably thinned, presumably to enable the flattening of the warped panel and the application of the cradle.
- ***Additions*** A wooden cradle was attached to the reverse of the panel before 1958 (see above, *Previous treatments*). It is composed of six vertical members glued to the panel reverse and eight horizontal, non-fixed members. The cradle does not appear to be blocked and thus allows natural in-plane dimensional changes of the panel.
- ***Cracks*** Close to the upper right edge, from a place where a section of the panel edge is missing, an old crack extends halfway down the panel.
- ***Deformations*** The panel has a slight convex deformation.
- ***Joins*** The join in the panel is closed, but the two planks seem to have been separated and rejoined in the past. There is very little difference in level, but the damages and fills have resulted in a distinct edge.
- ***Coated reverse*** The panel reverse was stained dark brown.
- ***Biological damage*** Traces of old woodworm damage are spread over the panel reverse.



25.8 57MICGBM005



25.9 57MICGBM002



25.10 VIS

Ground and paint layers

- ***Stability*** In general, the adhesion of both paint and ground appears relatively good. Locally, raised paint and ground, which is mostly older, but not consolidated, was noted in the sleeve of the kneeling magus and at the bottom of the tree at the lower left. In the dark green background, somewhat broader drying cracks were observed. The extensive craquelure is mainly an effect of natural dimensional changes of the panel. In many areas, however, craquelure has widened and opened up, damaging both paint and ground. Presumably this is a result of solvent interactions during cleaning treatments.
- ***Losses*** There are many losses of differing sizes in the painting, primarily to paint, but also to paint and ground. There are larger losses along the join and a very large damage is present at the bottom left part of the panel. At bottom right, in the black magus's left shoe, there is a dent in the original paint with a few losses.
- ***Abrasion*** The work is somewhat abraded overall, resulting in increased visibility of the whitish undermodelling of robes, especially at the ridges of brushstrokes (to give just one example). Multiple areas are highly abraded (e.g. in the sky, in Joseph and in the kneeling magus). In many areas with gold leaf detailing the gold is largely abraded (as in the Star of Bethlehem and fig. 25.4), including locally applied glazes on top (fig. 25.9). There are many (and often long) incisions or scratches in the sky area that are unrelated to the composition. Two other scratches were detected below the table and near the shoulder of the black magus. Old damages at the panel edge were probably the result of framing.
- ***Discoloration and increased transparency*** Red lake glazes have faded somewhat, which is especially apparent where it was applied thinly. The copper-green lakes have held up fairly well, but slight brown discoloration is visible. An increase in transparency is evident in the lighter paints, as in areas with lead white or flesh tones that now reveal more of the underlying layer (see, e.g., the underdrawing shimmering through in the Christ Child).
- ***Filling, retouching and overpainting*** Most losses have been filled and inpainted. Extensive retouching is present, for instance, at the entire bottom left part of the panel, at the kneeling magus and Joseph, and in the upper part of the sky. The retouching appears to have discoloured somewhat.

Surface finish

- ***Varnish*** The appearance of the modern varnish is quite regular and the paints are saturated well, although dark areas appear rather matte. The varnish is damaged somewhat at the bottom edge. Although the varnish is only slightly yellowed, old highly yellowed varnish residues are visible in the interstices of the paint.
- ***Surface dirt*** There is hardly any surface dirt on the painting. Some fingerprints are present in the retouched area at bottom left.
- ***Visibility of the original surface*** The paint film is well saturated in most places and has an even surface appearance. The matte areas, highly yellowed varnish residues and especially the discoloured retouching distract from an otherwise reasonably visible original paint surface.

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[1] An n-butyl polymethacrylate and polycyclohexanone (1:1) varnish.

[2] Magna colours (n-butyl polymethacrylate) retouching, and spray-varnishing with n-butyl polymethacrylate and polycyclohexanone.

[3] According to Van Schoute and Verougstraete-Marcq 1986 (21 fig. 3), this type of join appears in the beginning of the sixteenth century. This diagram was republished in Verougstraete-Marcq and Van Schoute 1989 (38 fig. 7), and in Verougstraete 2015 (46 fig. 13).

[4] The youngest or last-preserved rings on each of the two planks date from 1480 (I) and 1482 (II), respectively. Report by Peter Klein, University of Hamburg, Department of Wood Biology, 13 August 1987.

[5] The relatively broad drying cracks in the dark green background imply the use of oil there.





25.11–12 **VIS, after treatment** (photo courtesy Philadelphia Museum of Art)