

Recent Study of Raphael's Early Paintings in the National Gallery, London, with Infrared Reflectography

Rachel Billinge

Conservation Department of The National Gallery, London

The technical examination of paintings by Raphael in the National Gallery is not a new study and much has already been written about them, not least Joyce Plesters' paper at the Princeton Raphael Symposium of 1983, which gave a very thorough description of what she had discovered about the paintings at that time.¹ Since she studied them some of the paintings have been cleaned, and equipment and techniques for examination of paintings have advanced enormously in the last 20 years, so it was good that the preparations for the exhibition at the National Gallery, *Raphael: from Urbino to Rome* (20th October 2004–16th January 2005) provided the stimulus to look again at all of the paintings, and to conduct a full study with infrared reflectography.

Each of the National Gallery paintings in the exhibition was systematically studied with a vidicon and full infrared reflectogram mosaics were made of all except the *Portrait of Pope Julius* (NG 27) and the two large altarpieces.² Discussions of the underdrawings found in *The Garvagh Madonna* (NG 744) and *The Procession to Calvary* (NG 2919) have recently been published and *The Madonna of the Pinks* (NG 6596) is discussed by Ashok Roy in this volume³ so this paper will concentrate on four other works which produced interesting results.

An Allegory (*Vision of a Knight*) NG 213

The National Gallery is particularly fortunate in owning two works for which pricked cartoons survive.⁴ When Plesters discussed the *Vision of a Knight* (Fig. 1) in 1983 she had been unable to find any evidence of pouncing in the infrared photograph and was forced to conclude that the pricking of the cartoon was for some other purpose,⁵ however the new infrared reflectogram mosaic shows clearly that the underdrawing for the *Vision of a Knight* is based on pouncing (Fig. 2).⁶

The pounced dots have been joined up using paint or ink and only show where they have been trapped by the line, for example in the outlines of the hills in the background on the

right, and in the back of the skirt of the figure on the right. Even where the actual dots no longer remain, the style of the underdrawing revealed is typical of a drawing based on a cartoon transfer, with simple rather schematic outlines. Raphael was meticulous in his pricking of cartoons, using large numbers of closely spaced holes along every outline to produce an exceptionally complete replica of the cartoon on the panel, but after the basic design had been transferred he always elaborated the underdrawing further, adding hatching for shadows and making changes freehand.⁷ For example he added a tiny group of buildings to the left of the central tree, level with the bridge; and a lovely free squiggle, presumably intending to signify bushes, in the distant landscape above the bridge on the right.

The slight differences between the finished painting and the cartoon are well known, the most significant being the changes to the necklines of the two female figures and the replacement of a little bridge below the arm of the figure on the left with a group of horsemen. Plesters' examination of the infrared photograph led her to conclude that "in details



Fig. 1 – Raphael, *Vision of a Knight*, The National Gallery, London, NG 213, about 1504, oil on poplar, 17.5 x 17.3 cm.



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Fig. 2 – Raphael, Vision of a Knight, The National Gallery, London, NG 213. Full infrared reflectogram mosaic.

such as the necklines of the dresses or the substitution of the horsemen for the bridge, ... , the underdrawing revealed in the painting corresponds to the final painted image and not to the drawing on paper”.⁸ The new infrared reflectogram mosaic however, shows that the underdrawing actually follows the cartoon very closely and the main changes are not underdrawn. With one exception every pricked line in the cartoon can be seen in the infrared reflectogram mosaic, including the scalloped collar of the figure on the left. The lower, beaded neckline of the figure on the right was never pricked and does not feature in the underdrawing. The one exception is the little bridge which is pricked for transfer but of which no sign could be found with infrared reflectography. Presumably the decision to dispense with the bridge

and substitute the horsemen was made quite early and it was either never pounced onto the panel or the *spolveri* were brushed away before the stage of fixing with a wet line.

The freehand changes to the underdrawing can also be seen, drawn but not pricked, on the cartoon; possibly the ideas were tried out first on the paper and then copied onto the panel, or perhaps added to the cartoon after having been made on the panel as a reminder. Most of the changes however seem to have been made during painting without any further underdrawing, at which stage other delicate details such as the flowers held by the figure on the right and in her hair were added.



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Fig. 3 – Raphael, Saint Catherine of Alexandria, The National Gallery, London, NG 168, about 1507, oil on wood, 72.2 x 55.7 cm.

Fig. 4 – Raphael, Saint Catherine, NG 168. Detail from infrared reflectogram mosaic, showing head and right shoulder.

Fig. 5 – Raphael, Saint Catherine, NG 168. Detail from infrared reflectogram mosaic showing the drapery to the left of her left hand.

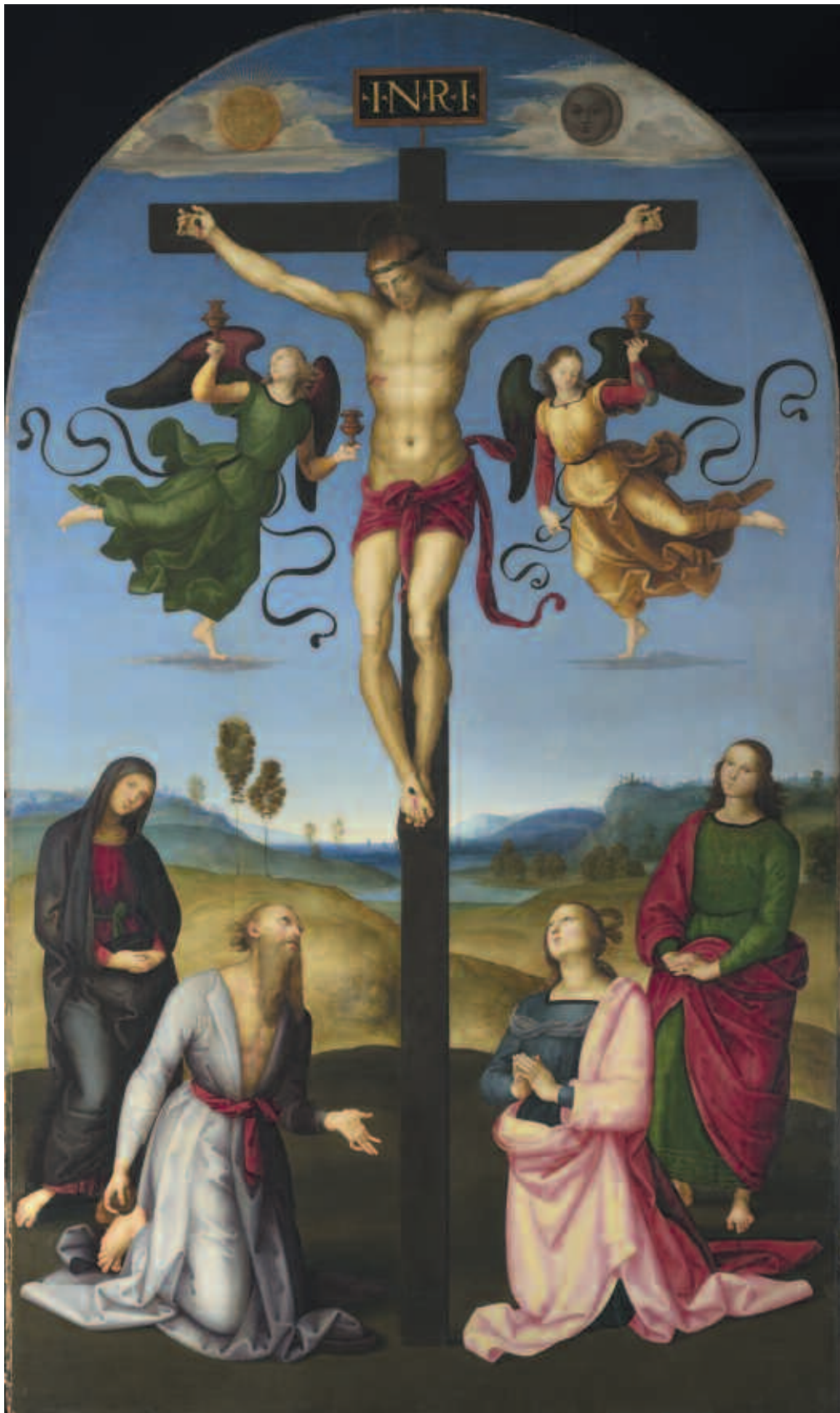
Saint Catherine of Alexandria (NG 168)

The second National Gallery painting for which a cartoon survives is *Saint Catherine of Alexandria* (Fig. 3). The cartoon, in black chalk with touches of white chalk on four sheets of beige paper pasted together, is pricked for transfer along the outlines.⁹ When Plesters studied the painting for the Princeton Symposium she only had IR photographs to help her and reported that the underdrawing consisted of “smooth, thin lines, with no sign of spolveri”.¹⁰ The fact that the Paris cartoon was used for the National Gallery painting has been much more difficult to prove than was the case for the *Vision of a Knight* and wouldn’t have been possible at all without the help and generosity of the curators and scientists at the Louvre. The correlation of sizes between the two was

tested first, by taking a tracing of the figure in the painting over to France and laying it over the drawing. Apart from the angle of the head the two were found to match so closely that a second tracing was made, this time a “map” of all the pricked holes in the cartoon.¹¹ This was brought back to London and when the picture was re-examined with infrared reflectography, with the help of the “map” it was possible to find a few traces of spolveri (although it has to be said that, had we not had such good reasons to believe in them, they would probably have been rejected as not sufficiently distinct from the spots caused by bubbles in the gesso).

Far more compelling as an argument for the use of the cartoon is that virtually every line in the cartoon that was pricked can be seen in the underdrawing, even where Raphael then went on to make changes so that the lines are not followed in the paint (Fig. 4). Most obvious is the knot on the Saint’s shoulder in the cartoon, which does appear, although in a truncated form, in the underdrawing but was never painted.

In the drapery beside Saint Catherine’s left hand there are a number of changes – for example the folds in the yellow lining of the cloak are drawn roughly horizontal in the cartoon but painted falling diagonally to the left. In infrared reflectography the horizontal lines from the cartoon can be seen crossing the drawing for the folds as painted (Fig.5). In



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Fig. 6 – Raphael, The Crucified Christ with the Virgin Mary, Saints and Angels (The Mond Crucifixion), National Gallery, London, NG3943, about 1502–3, oil on poplar, 283.3 x 167.3.



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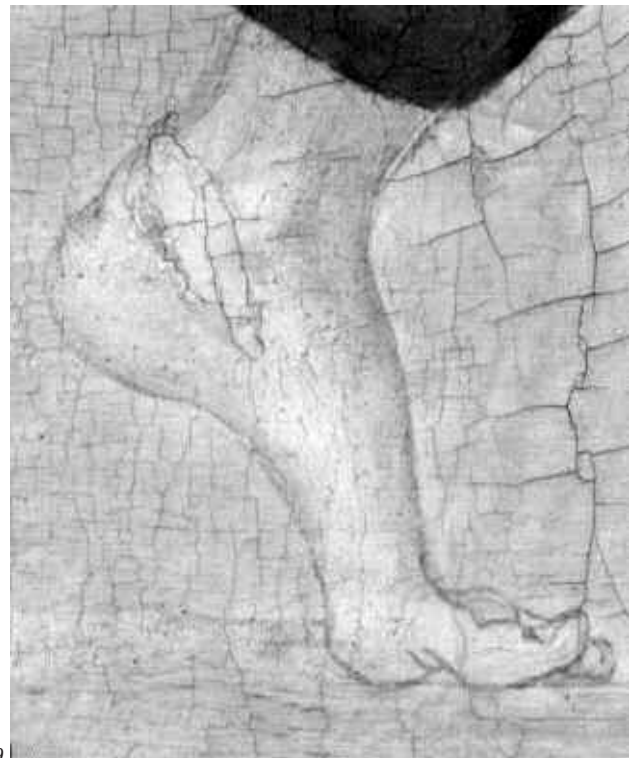
the final painting Raphael added extra folds as the dress is pushed up slightly against the cloak. The changes in the drapery folds were underdrawn freehand. The lines appear broader and darker than those relating to the cartoon perhaps because they are in a different material or possibly, as this is a change, they may be closer to the surface in the layer structure.¹²

The Crucified Christ with the Virgin Mary, Saints and Angels (The Mond Crucifixion)
NG 3943

The *Mond Crucifixion* is a relatively early work, painted about 1502–3 (Fig. 6), and much larger in scale than anything so far discussed, standing almost three meters high (actual size 283.3 x 167.3 cm). Underdrawing is visible in many places in normal light and infrared photography produces excellent images of the underdrawing where the paint is penetrated. For example the Magdalen's pink drapery shows simple linear drawing, clearly in a liquid medium (Fig. 7). The lack of major changes and the simple, formulaic nature of the drawing is typical of Raphael's underdrawings made from cartoons but despite careful examination, no evidence could be found of squaring or of registration lines for a cartoon and no pouncing was seen, so that the method used for transferring the design to the panel is still not known. For this picture, infrared reflectography did not add a great deal to what was already known except to highlight one interesting anomaly. In infrared reflectography some of the underdrawing clearly visible in normal light disappears, while other areas of underdrawing show clearly. Figures 8



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Fig. 7 – Raphael, *The Mond Crucifixion*. IR photograph of the Magdalen's pink drapery.

Fig. 8 – Raphael, *The Mond Crucifixion*. Detail of left foot of angel in green.

Fig. 9 – Raphael, *The Mond Crucifixion*. Infrared reflectogram mosaic detail of left foot of angel in green.



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Fig. 10 – Raphael, *The Madonna and Child with Saint John the Baptist and Saint Nicholas of Bari (The Ansidei Madonna)*, *The National Gallery, London, NG 1171, 1505, oil on poplar, panel size 245 x 157 cm.*

Fig. 11 – Raphael, *The Ansidei Madonna*, IR photograph showing underdrawing in St John's drapery.

Fig. 12 – Raphael, *The Ansidei Madonna, NG1171. Infrared reflectogram mosaic detail showing the Christ Child.*

Fig. 13 – Raphael, *The Ansidei Madonna, NG1171. Infrared reflectogram mosaic detail showing the head of Saint Nicholas of Bari.*

and 9 show the left foot of the angel in green. In normal light underdrawing can be seen all around the foot, but in infrared reflectography there is clear drawing for the toes but it does not continue up the leg. The fact that some of the underdrawing disappears in infrared reflectography and some does not (although looking the same in normal light where visible) suggests that two different materials have been used; the one that disappears is probably iron gall ink while the other is a carbon-containing black. The almost random choice of one or other material (both being used in the same figure sometimes, for example Christ, whose drawing disappears in his arms and hands but does not in his loin cloth or knees) suggests that the artist was not particular as to which black ink he used for the drawing of a particular area, but just used whatever was to hand.

The Madonna and Child with Saint John the Baptist and Saint Nicholas of Bari (The Ansidei Madonna) NG 1171

The *Ansidei Madonna* is another large panel (245 x 157 cm), and dates from 1505 (Fig. 10). It has been known for some time that there is a regular grid incised under the paint of *The Ansidei Madonna*¹³ and it has been suggested that

the grid was used to help copy a squared drawing onto the panel. However recent investigations have cast doubt on this theory, which in any case was fairly unlikely since the squares are rather too large to be useful guides to copying. Again infrared photographs are helpful to show the nature of the underdrawing, revealing drawing not dissimilar to that seen in the *Mond Crucifixion* with simple outlines of folds in the drapery, in a liquid medium, but here elaborated with some hatching (Fig. 11). In the Virgin and Child group clear signs of pouncing were found, the dots have been joined and most of them brushed away leaving the simple drawing. Figure 12 is an infrared reflectogram mosaic detail of the Child showing the simple linear drawing typical of a transfer from a cartoon and some of the *spolveri* around his hands and legs. As ever with Raphael there are changes to these figures – the Child's head has been changed and his eyes moved, and in the lower half of his body the arm and hand and the legs have been changed. No *spolveri* could be found anywhere in the figure of Saint John but the underdrawing is so similar in style to that for the Virgin that it is certain he too was based on a cartoon. Saint Nicholas of Bari is different. The underdrawing (Fig. 13) is much freer and the lines look much finer in the infrared reflectogram. The drawing in the face shows aspects of Raphael's interest in geometry and volume – drawing the curves of the cheekbones, and the structure of the nose for example, which is similar to the kind of drawing seen later in *The Garvagh Madonna*.¹⁴

It would therefore appear that Raphael used a mixture of techniques when assembling *The Ansidei Madonna* on its panel. The key figures of the Virgin and Child had a cartoon,

as did Saint John. Whether Saint Nicholas was drawn entirely freehand or had a simpler cartoon which needed more elaborate reworking on the panel is not clear, but infrared reflectography and x-radiography show that significant changes were made to this figure quite late in the picture's development – he was initially bare headed and wearing shorter robes which revealed his ankles. The grid may not have been used for freehand copying of the underdrawing but would have helped in establishing the geometry of the composition, the scale to which the cartoons must be made, and in positioning the cartoons on the panel.

Conclusion

The National Gallery's nine paintings by Raphael provide a useful sample of the different types of work he was pursuing in his early career – including as it does small secular and devotional works as well as large altarpieces. What comes out of their study with infrared reflectography, together with study of the related drawings, is a picture of a man for whom design was crucial, who worked in a systematic and controlled way with meticulous care – drawing and re-drawing until the design was right then making use of methods of mechanical transfer to ensure that a successful design was accurately reproduced (not just between paper and panel but also at intermediate stages between studies). But significantly this method of working did allow flexibility and at every stage we see small alterations and improvements as well as larger changes, right through to the final applications of paint.

Notes and references

1. Plesters J., 'Technical Aspects of Some Paintings by Raphael in the National Gallery, London' in *The Princeton Raphael Symposium: Science in the Service of Art History*, Princeton Monographs in Art and Archaeology XLVII, Shearman J. and Hall M.B. eds, Princeton, New Jersey 1990, pp. 15–37 and figs. 1–29. Publications of the most recent new work can be found in Chapman H., Henry T. and Plazzotta C., et. al., *Raphael: From Urbino to Rome*, exh. cat., National Gallery, London 2004; Roy A., Spring M. and Plazzotta C., 'Raphael's Early Work in the National Gallery: Paintings before Rome', *National Gallery Technical Bulletin*, 25, 2004, pp. 4–35 (especially pp. 5–7 for underdrawing); and in the contributions by M. Spring and A. Roy in this volume. Other publications containing information about technical examinations of National Gallery Raphaels include Dunkerton J., Foister S., Gordon D. and Penny N., *Giotto to Dürer: Early Renaissance Painting in The National Gallery*, New Haven and London 1991 (especially pp. 169–170); Dunkerton J., Foister S. and Penny N., *Dürer to Veronese: Sixteenth-Century Painting in The National Gallery*, New Haven and London 1999 (especially pp. 225–231); Braham A. and Wyld M., 'Raphael's "S. John the Baptist Preaching"', *National Gallery Technical Bulletin*, 8, 1984, pp. 15–23; Penny N., 'Raphael's "Madonna dei garofani" rediscovered', *Burlington Magazine*, CXXXIV, 1992, pp. 66–81; and Dunkerton J. and Penny N., 'The Infra-red Examination of Raphael's "Garvagh Madonna"', *National Gallery Technical Bulletin*, 14, 1993, pp. 6–21; (and see also note 3 below).
2. Infrared reflectography was carried out using a Hamamatsu C2400 camera with an N2606 series infrared vidicon tube. The camera is fitted with a 36mm lens to which a Kodak 87A Wratten filter has been attached to exclude visible light. The infrared reflectogram mosaics were assembled on a computer using Vips-ip software. For further information about the software see the Vips website at www.vips.ecs.soton.ac.uk.
3. Plazzotta C., 'Raphael, The Madonna and Child with the Infant Baptist (The Garvagh Madonna)' in *Art in the Making: Underdrawings in Renaissance Paintings*, ed. Bomford D., exh. cat., National Gallery, London, 2002, pp. 128–135; Plazzotta C., 'Raphael, The Procession to Calvary' in *Art in the Making: Underdrawings in Renaissance Paintings*, ed. Bomford D., exh. cat., National Gallery, London 2002, pp. 122–127.
4. A cartoon also exists for the *Mackintosh Madonna* (NG 2069) but the painting is in such a poor condition that technical examination was not attempted. The cartoon for the *Vision of a Knight*, which was acquired at the same time as the picture, used to hang alongside. It is now in the care of The British Museum (1994-5-14-57).
5. "The implication is that although the drawing on paper may well be Raphael's preparatory drawing for the painted panel, its use as a *punched* cartoon seems more likely to have been for the purpose of making a copy either of the drawing itself or of the painted panel." Plesters J., in Shearman and Hall, 1990, cited in note 1, p. 18.
6. Confirmation of the presence of dots from pouncing was first published in Dunkerton J., et al, 1991, cited in note 1, pp. 169–170.
7. Raphael's use of cartoons is discussed in Bambach C., *Drawing and Painting in the Italian Renaissance Workshop. Theory and Practice, 1300–1600*, Cambridge 1999, pp. 14–15. For discussion of his use of a cartoon for *The Procession to Calvary* (NG 2919) see Plazzotta C., in Bomford D., ed. cited in note 3, pp. 124–127.
8. Plesters J., in Shearman and Hall, 1990, op. cit. in note 1, p. 18.
9. Département des Arts Graphiques, Musée du Louvre, Paris, inv. 3871. See Chapman, Henry and Plazzotta cited in note 1, p. 231.
10. Plesters J., in Shearman and Hall, 1990, cited in note 1, p. 25.
11. This work was carried out by C. Plazzotta, J. Dunkerton and T. Henry, with the kind assistance of Catherine Goguel of the Département des Arts Graphiques at the Louvre.
12. None of the limited number of paint samples from this picture contain any underdrawing so it has not been possible to determine where in the layer structure it lies, but a difference such as this could be explained if the first drawing were under the priming and the changes applied over it.
13. A note of 1938 describing the grid together with a diagram is in the National Gallery history dossier on the painting. Some incisions are visible in raking light. For a full discussion of the new findings see Cooper D. and Plazzotta C., 'Raphael's *Ansdei* altarpiece in the National Gallery', *Burlington Magazine*, CXLVI, 2004, pp. 720–731.
14. Plazzotta C., in Bomford D., ed. 2002, cited in note 3, pp. 128–135, especially fig. 224.