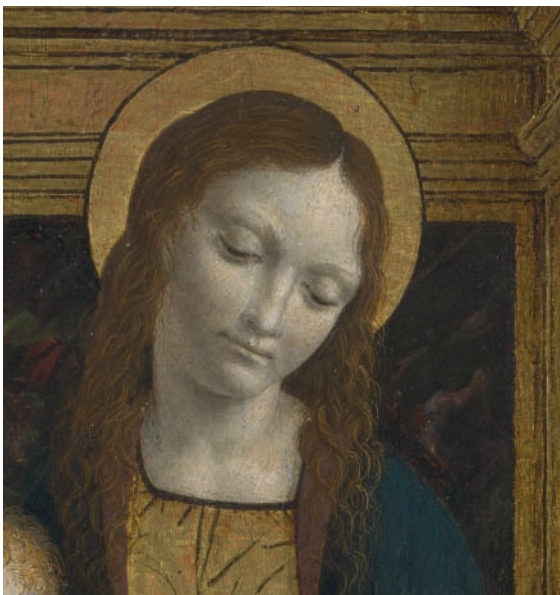
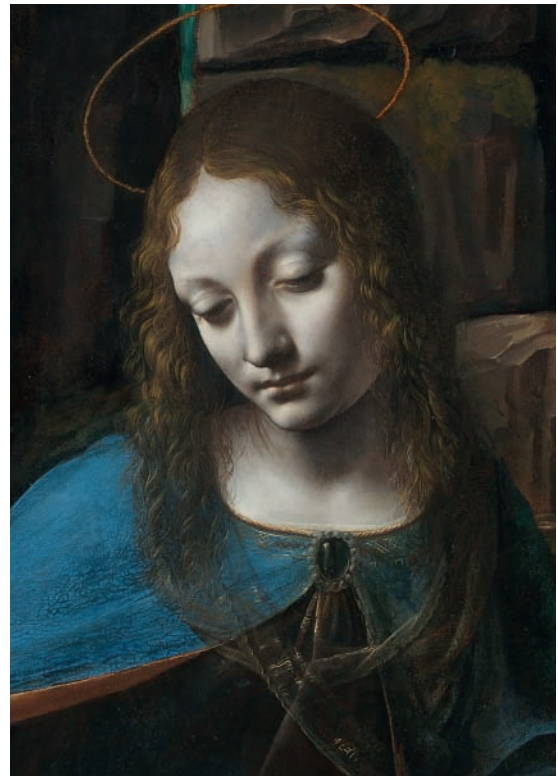


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VOLUME 32 *Leonardo da Vinci: Pupil, Painter and Master*



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FRONT COVER

Leonardo da Vinci, *The Virgin of the Rocks* (NG 1093), c.1491/2–9 and 1506–8 (detail).

TITLE PAGE

Top left: Andrea del Verrocchio, *The Virgin and Child with Two Angels* (NG 2508), c.1467–9 (detail).

Bottom left: Master of the Pala Sforzesca, *The Virgin and Child with Four Saints and Twelve Devotees* (NG 4444), probably c.1490–5 (detail).

Right: Leonardo da Vinci, *The Virgin of the Rocks* (NG 1093), c.1491/2–9 and 1506–8 (detail).

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Leonardo in Verrocchio's Workshop: Re-examining the Technical Evidence

JILL DUNKERTON

Considering Leonardo da Vinci's contemporary and subsequent celebrity, it is remarkable that the only documented facts about his artistic training and early career are that his name appears among the membership list of the newly reincorporated Florence Compagnia di San Luca in 1472, when he was 20 (an age by which he might be expected to have completed a basic education in painting), and that in 1476, when charged with sodomy, he is recorded as still resident in Andrea del Verrocchio's household.¹ Verrocchio was also recorded as a member of the Compagnia in 1472.² Almost all that we know about Leonardo's early years comes from Vasari,³ writing a century later and with his biographies coloured and often distorted by his aim of presenting a continuous progression and improvement of the arts in Italy.

This distortion manifests itself in the well-known account added to the 1568 edition of the 'Life of Andrea del Verrocchio' in Vasari's *Lives of the Most Excellent Italian Painters, Sculptors and Architects*. It describes Leonardo assisting Verrocchio in the execution of *The Baptism of Christ* for San Salvi (FIG. 1) and painting an angel 'so superior to the rest of the work that Andrea resolved that he would never take up a brush again'.⁴ Vasari, in Leonardo's own biography, confirms Leonardo's presence in the workshop, with an account, possibly also partly mythical, of how Leonardo's father Ser Piero da Vinci showed some drawings by his multi-talented son to Verrocchio, who happened to be a friend and who 'was astonished to see the extraordinary beginnings of Leonardo', resulting in the arrangement that he join his workshop.⁵ While Vasari's account is wonderfully descriptive in the range of activities that he attributes to the young artist, 'not one branch of art only, but all of those in which design [*disegno* in its broader sense, not just drawing] played a part', including model making, architecture and startlingly ambitious engineering projects, it is notable that he says nothing more about his early activity as a painter. There are few clues as to when Leonardo began his training with Verrocchio, only that by the time he was seventeen he had moved to Florence with his father, who recorded him as a dependent in his

tax return of 1469.⁶ If he joined Verrocchio's workshop around then, he would have been a relatively late starter and, as indicated by the charge of 1476, he seems to have remained associated with the workshop for an unusually long time, allowing him to overlap with Lorenzo di Credi, who was at least five years his junior. In addition, Vasari states in the 1550 'Life of Lorenzo di Credi', about whom he was very well informed, that Lorenzo 'was companion, dear friend, and *molto dimestico* of Leonardo da Vinci, with whom, under Andrea del Verrocchio, for a long time they studied together the art'. In the extended 1568 'Life' he added that Pietro Perugino was also a companion, friend and fellow pupil.⁷

If the young Leonardo was qualified to be a member of the painters' Compagnia di San Luca in 1472 he had presumably acquired some experience in that art,⁸ but for him painting may not necessarily have been the principal attraction of an education in Verrocchio's workshop. Rather it was the acquisition of design skills (*disegno*) applied across a wide range of media, working in two and three dimensions. Projects such as the casting of the huge gilt bronze *palla* to crown the Florence Duomo demanded a degree of ingenuity and invention which would surely have appealed to the young man described by Vasari. Central to this was the acquisition, or perhaps improvement, in Leonardo's case, of his skills as a draughtsman. The foundation of Leonardo's drawing practice in that of Verrocchio is fundamental and has been much discussed.⁹ Vasari also tells us that Leonardo modelled heads of women and children, and he was later to advertise his experience in that field,¹⁰ but all attempts to identify the hand of the young Leonardo in the sculptural output of Verrocchio's workshop have been controversial, with much of the argument centred on the belief that Verrocchio had little interest in direct observation of nature.¹¹

The question of Verrocchio's part in the training of Leonardo as a painter has only really been discussed in general terms, with little consideration of the practicalities of producing a painting.¹² The assumption that Leonardo followed a conventional apprenticeship, starting with the basics and gradually acquiring all the



FIG. 1 Andrea del Verrocchio and workshop, completed by Leonardo da Vinci, *The Baptism of Christ*, c.1468–77. Tempera and oil on poplar, 177 × 151 cm. Florence, Galleria degli Uffizi, inv. no. 8358.

necessary craft skills, as Cennino Cennini famously (and even then probably unrealistically) suggested, is almost certainly incorrect. By the mid-fifteenth century there seems to have been great flexibility in the organisation of Florentine workshops.¹³ Successful shops with a prestigious clientele such as Verrocchio's, and previously that of Filippo Lippi,¹⁴ included artists and craftsmen of varying degrees of experience, ranging from young pupils to fully trained artists who were extending their education or were not yet able to set up as independent masters. A large shop such as Verrocchio's, operating in a major centre such as Florence, is likely to have employed, or sub-contracted, specialists for mundane tasks such as grinding pigments or preparing panels for painting. While Leonardo would have needed to know how to supervise such tasks, he is unlikely to have spent much time actively engaged in them; indeed his sometimes puzzling comments on technique in his later writing might support this supposition.¹⁵ It is not necessary therefore, for him to have joined the workshop as a young boy, and given his wide interests and the breadth of his general education, he may have been rather older than was usual when he took up painting.

Three panels universally accepted as painted by Leonardo while still associated with Verrocchio – *The Annunciation* (Uffizi, Florence; see FIG. 19), the *Portrait of Ginevra de' Benci* (National Gallery of Art, Washington, DC; see FIG. 33) and *The Madonna of the Carnation* (Alte Pinakothek, Munich; see FIG. 35) – have all been the subject of recent technical and scientific study,¹⁶ but with discussion of Verrocchio's role in Leonardo's education limited principally to his general influence, particularly as a draughtsman. The greatest obstacle to a better understanding of what Leonardo may have learnt from his master has been past difficulty and disagreement in identifying Verrocchio's own output as a painter.¹⁷ In recent years, light has been shed on this problem by the cleaning and technical examination of a small group of paintings associated with his workshop, first, and most important, *The Baptism* (Uffizi, Florence; see FIG. 1).¹⁸ Careful observation of the paint surface, together with an archival discovery, has conclusively contradicted the myth of the gifted young Leonardo working alongside his master, the superiority of his contribution causing Verrocchio to abandon the art of painting. Instead, it appears that the altarpiece is likely to have been commissioned as early as 1468 by one of Verrocchio's brothers, Don Simone, on becoming Abbot of San Salvi, just outside the walls of Florence, and that the greater part of the composition had been executed in the traditional tempera

technique before it was put aside, presumably as a result of pressure of more important commissions. It was subsequently completed and retouched by Leonardo using an oil-based technique and in a style – particularly in the landscape – that makes it highly unlikely for his intervention to have preceded the painting of *The Annunciation* (generally dated to around 1474). Indeed Leonardo may well have worked on it as late as 1476, when we know that he was still associated with Verrocchio. Perhaps inevitably, discussion of these discoveries has tended to focus on Leonardo's contribution; moreover, they do not necessarily confirm Verrocchio's own part in the first tempera phase of the execution.

However, the recent attribution to Verrocchio, following cleaning and investigation, of a small painting of *The Virgin and Child with Two Angels* in the National Gallery (FIG. 2)¹⁹ can help to clarify his role in *The Baptism*. Previously catalogued at the National Gallery as Florentine School and most commonly linked with Botticelli, *The Virgin and Child with Two Angels* has been reattributed and dated to around 1467–9, principally on the basis of its sculptural qualities, including striking similarities of detail to Verrocchio's bronze and terracotta sculpture of the late 1460s, notably the *David* and the *Careggi Resurrection* (both Museo Nazionale del Bargello, Florence). Secondly, a close association can be demonstrated between the tempera hatching and modelling of the heads in the painting with the technique of a highly worked drawing on paper (Gabinetto dei Disegni e Stampe, Uffizi, inv. 250E) that can be identified as Verrocchio's self portrait, probably drawn in the same period, and which seems subsequently to have served as the basis for the woodcut frontispiece to the 1568 edition of Vasari's 'Life of Verrocchio'. Finally, there are connections of style and technique with passages of *The Baptism*. In addition, the technique of the London panel supplies important evidence as to how far the altarpiece had progressed before it was left for later completion by Leonardo.²⁰

With its richly coloured draperies of deep red, blue, purple and green, and the depiction of cloth of gold fabrics with flickering touches of lead-tin yellow paint rather than real gold, *The Virgin and Child with Two Angels* indicates an awareness of the innovatory oil techniques employed by the Pollaiuolo brothers for their altarpiece for the Cardinal of Portugal's chapel at San Miniato in Florence and probably also of the same early Netherlandish paintings that had stimulated them. Yet analysis of paint samples has demonstrated that it was executed entirely in the traditional Florentine medium of



FIG. 2 Andrea del Verrocchio, *The Virgin and Child with Two Angels* (NG 2508), c.1467–9. Tempera on wood, 69.2 × 49.8 cm.



FIG. 3 NG 2508, X-radiograph.

egg tempera. The pigments employed are also standard for Florentine painting of the time – only the indigo used as an underlayer to the ultramarine of the Virgin’s mantle is not as commonly found in Florence as it is in North Italian painting.²¹ Nevertheless, aspects of the technique are slightly unorthodox, suggesting that Verrocchio had perhaps only recently decided to add the craft of painting to his skills as sculptor and goldsmith. The X-ray and infrared images (FIGS 3 and 4) reveal an unusual number of pentimenti for a tempera painting on panel. The underdrawing is strikingly bold and free, with some modifications to the design at this stage, but most of the alterations were made during the process of painting. These include the repositioning of the haloes, the reduction of the height of the Virgin’s headdress and the replacement of her coiled plait with a padded headband, as well as changes to the bunched folds of the Virgin’s mantle over her right arm and the elimination of the loosely draped cloak of the angel on the left. Numerous overlaps and small adjustments to the contours of the heads of the figures have resulted in a build up of paint layers which register strongly in the X-radiograph. One sample, from the top of the wing of the angel on the left, contains as many as ten layers, an exceptional number for



FIG. 4 NG 2508, infrared reflectogram, before restoration.

a tempera painting. Most unusual of all is the presence, clearly evident in the infrared reflectogram, of washes of a yellow-brown undermodelling beneath the draperies of the figures. The artist conceived his design initially in terms of relief, to which colour was then applied.

Allowing for differences in scale and in the age and sex of the subjects, it can be seen that the areas of flesh painting in the figures of the Virgin in the London panel and the Baptist in the San Salvi altarpiece share not just resemblances of physiognomy but also a similar build up of the tempera modelling over the conventional underlayer of green earth, in both cases mixed with lead white so that it is relatively pale in colour (FIGS 5, 6, 7 and 8). The handling of the liquid tempera and the hatching of the strokes is considerably broader and more open in the large-scale San Salvi painting. However, the procedure of shading with a greenish-brown *verdaccio* mixture (probably mainly earth pigments with some black) and then adding the pale pink highlights and the flush of deeper red, not just to the cheeks but also to the sides of the nose and the nostrils, is comparable – perhaps better demonstrated by the angel on the left in the London painting. It can be argued, therefore, that Verrocchio did paint the figure of the Baptist himself. Moreover, its

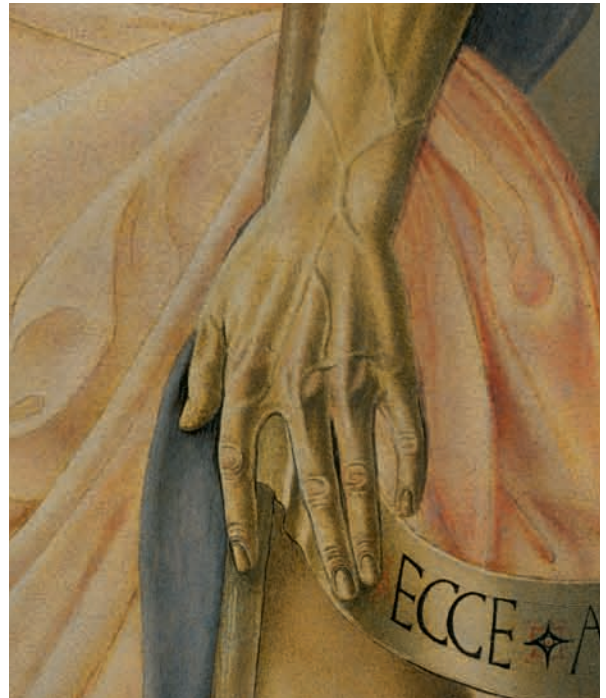


FIG. 5 NG 2508, detail.

FIG. 6 NG 2508, detail.

FIG. 7 Andrea del Verrocchio and workshop, completed by Leonardo da Vinci, *The Baptism of Christ* (FIG. 1), detail.

FIG. 8 Andrea del Verrocchio and workshop, completed by Leonardo da Vinci, *The Baptism of Christ* (FIG. 1), detail.

sculptural qualities would be very much more apparent were it not for the drastic fading of the red lake of his cloak²² and the abrasion in past cleaning of the light blue lining (perhaps never quite finished), changes which have almost eliminated any sense of volume in the folds. Their bulging curves were probably once very like those of the Virgin's mantle in the smaller painting.

Since close examination of the picture surface enables the areas painted in tempera to be distinguished from those added by Leonardo with his pastose, brush-marked and blotted oil paint, it is now clear that the angel on

the right, facing forwards, is – as has traditionally been believed – by Verrocchio (its quality perhaps somewhat compromised by its condition). The sky, with the figure of God the Father and the dove, and the parts of the landscape on either side of the figure groups not covered over by Leonardo's reworking of the central area, are also part of the first campaign. Variations in the quality of execution and design, however, reveal that Verrocchio was already in the habit of consigning distinct zones of his paintings to members of the workshop, entrusting them with supplying the drawings for the assigned areas,

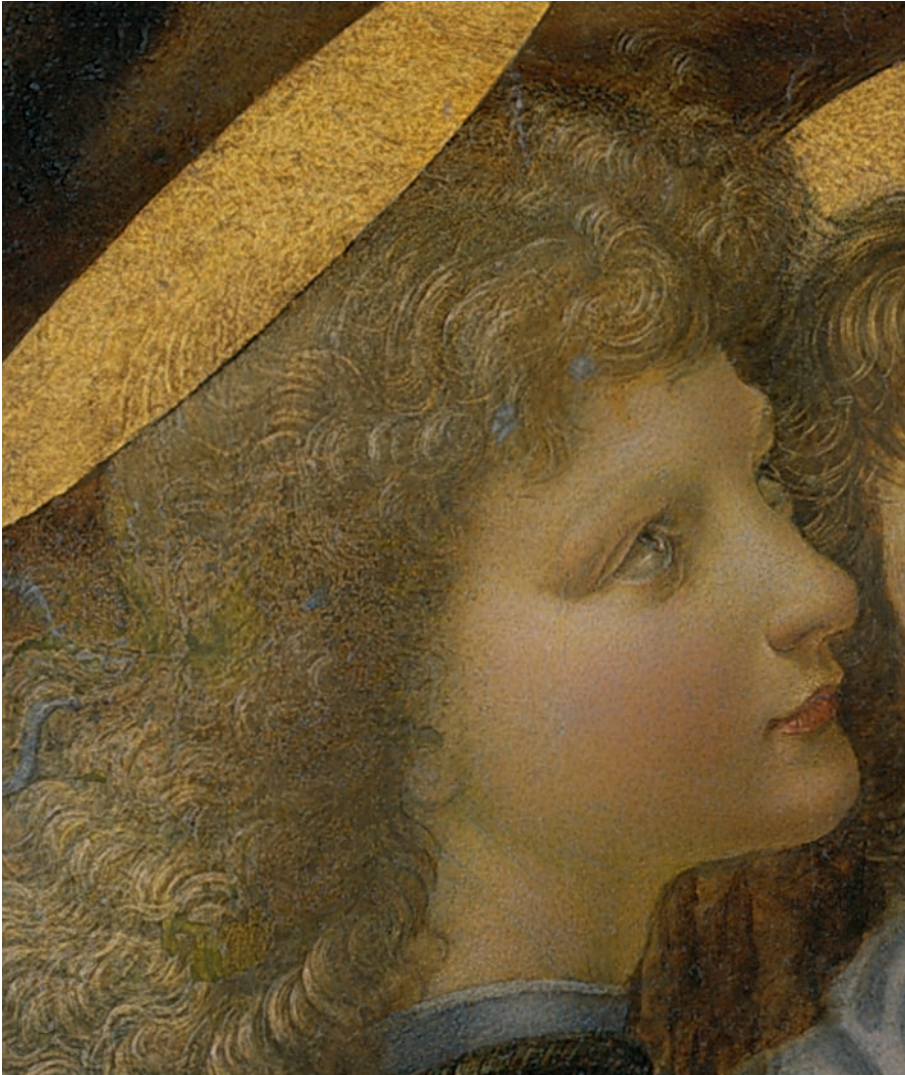


FIG. 9 Andrea del Verrocchio and workshop, completed by Leonardo da Vinci, *The Baptism of Christ* (FIG. 1), detail.

not just the application of paint following one of his own designs.²³ This can be the only explanation for the clumsy palm on the left, and the conventional and rather formless drawing of the hands of God the Father and the dove. In the rocky outcrop on the right there is a notable difference between the refined technique and understanding of the geological structure in the area to the left of the Baptist, surely by Verrocchio, and that in the main part to the right. This earlier assistant, who can perhaps be identified as Francesco Botticini, one of the first wave of painters to have emerged from Verrocchio's tutelage in the later 1460s,²⁴ may well also have been responsible for the central area of landscape, now submerged under Leonardo's reworking.

Even in the recent analysis of *The Baptism* the Vasari myth has been allowed to linger. The figures of Christ and the angel on the left have been assigned entirely to Leonardo, although it was recognised that Christ's striped

loincloth was evidently part of the tempera phase, its contours clearly overlapped by the slightly straggled ends of Leonardo's strokes of sticky oil paint. He seems also to have retouched parts of the pattern.²⁵ Yet the loincloth must have been attached to a figure. The role of the green earth underlayer and the monochrome undermodelling of *The Virgin and Child with Two Angels* in establishing the sculptural logic of that group would suggest that underneath Leonardo's surface paint, there remains at least a first lay-in of green earth in tempera for Christ's flesh, and possibly a more developed *verdaccio* modelling. Certainly, Verrocchio must have taken it further than a simple outlining as part of the underdrawing stage, and it would seem that Leonardo respected this, given the Verrocchiesque character and proportions of the final figure, which have often been remarked upon.²⁶ Moreover, the exceptional density of the flesh tints in this area to X-rays,²⁷ even by the standards of Leonardo's other early



FIG. 10 Andrea del Verrocchio and workshop, completed by Leonardo da Vinci, *The Baptism of Christ* (FIG. 1), detail, before restoration.



FIG. 11 NG 2508, detail.

oil paintings, discussed below, suggests that he may have been covering much more than a bare ground or a thin layer of green earth.

The same would then apply to the celebrated angel on the left (FIG. 9). Again it has been acknowledged that this figure holds a drapery that belongs to the first campaign, painted with the same fugitive red lake as the Baptist's cloak, but there is also an underpainting of green earth or *verdaccio*, now exposed by flaking of the upper paint layers from the angel's hair (FIG. 10), which logically cannot be assigned to Leonardo.²⁸ Such an underpaint, apparently in tempera and roughly modelled with the first indications of locks of hair, is far more likely to be part of Verrocchio's painting; directly comparable passages are evident in thin or damaged areas of *The Virgin and Child with Two Angels* (FIG. 11). The final soft and fluffy hair with its blue ribbons is clearly by Leonardo, but close inspection reveals that, unlike in the figure of Christ, a greenish undertone is in fact apparent under the flesh tints of the angel's face. The flesh tints of the cheeks, forehead and nose are thinly painted and smooth, and flushed with pink, very different from the ivory complexions of the Virgin and Angel in *The Annunciation*, or the pallor of the *Portrait of Ginevra de' Benci* (even if, in both cases, some fading of red lake components may have occurred) (see FIGS 19 and 33). Only in the paint of the angel's mouth, with its dark ruby red lips (very like those of Christ), and in his nearer eye, is there evidence of the thicker, sticky oil paint, sometimes bubbling and

contracting to form fine drying cracks, that characterises Leonardo's intervention. The retouching of the right eye included the addition of long, widely spaced eyelashes, also to be seen on Christ, and delicate highlights to give the eyeball a glistening glaucous quality. These highlights, together with minute unrestored flake losses, now give the impression that the iris is blue or grey, whereas the further eye is clearly brown. The eyelashes of this further eye are indicated with a single heavy stroke of black, just as in the other angel, and the whole eye is economically constructed with the rapid confident strokes of tempera to be seen in the eyes of the Baptist.

It would seem, therefore, that the head of this angel, far from being 'a visitant from another world' introduced by Leonardo²⁹, is in fact the creation of Verrocchio, a more refined development of the upward gazing angel on the left of the earlier *Virgin and Child with Two Angels*, and that the painting of the face was almost complete before the painting was put aside.³⁰ The angel's draperies, on the other hand, are in oil and by Leonardo. Yet they must also have been painted over a previous underdrawing³¹ and perhaps an undermodelling. The angel's pose, back turned towards us, resulting in the omission of wings,³² makes sense as the invention of a sculptor. In their final form, however, the robes, with their sharp triangular folds which spread fan-like over the ground, are more typical of Leonardo's drapery style, or that of Verrocchio in his paintings of the mid-1470s.

If Leonardo did not participate in the execution of



FIG. 12 NG 2508, detail of infrared reflectogram, before restoration.



FIG. 13 Leonardo da Vinci, *The Adoration of the Magi* (detail), unfinished, commissioned from Leonardo in about 1480–2. Oil on panel, 243 × 246 cm. Florence, Galleria degli Uffizi, inv. 1594.

FIG. 14 Leonardo da Vinci, *Saint Jerome* (detail), unfinished, about 1488–90. Oil on walnut, 103 × 75 cm. Vatican City, Vatican Museums, inv. 40337.

the altarpiece until 1476 or so, the question arises as to whether he witnessed the earlier campaign as a junior member of the workshop. Perhaps the most compelling evidence that he had some knowledge of Verrocchio's painting procedure in the late 1460s is the discovery of the washes of monochrome undermodelling of the draperies in *The Virgin and Child with Two Angels* (FIG. 12). However, it is of course possible that Verrocchio continued to employ this practice into the early 1470s in works now lost to us.³³ Leonardo's preference for developing his underdrawn compositions by shading with washes rather than hatching³⁴ is well known, since his technique is exposed by the several works that he left unfinished. In the most notable examples, *The Adoration of the Magi* (Uffizi, Florence), abandoned on his departure from Florence in 1482 (FIG. 13), and the Vatican *Saint Jerome* (FIG. 14), now dated by many scholars to the late 1480s,³⁵ the presence of layers of discoloured varnish (and possibly later reworkings in the case of the former)³⁶ means that the resemblance to the yellow-brown undermodelling in the Verrocchio panel is now exaggerated.

Much of Leonardo's monochrome development of these two compositions was carried out in washes that are better described as grey than brown, yet in other Milanese works with partially incomplete passages, such as the *Portrait of a Young Man ('The Musician')* (Pinacoteca Ambrosiana, Milan) and the London version of *The Virgin of the Rocks*, passages of brown undermodelling are evident. These can also be seen in cross-sections from the latter. In these cases, however, they consist of distinct paint layers, clearly in the same oil medium as the rest of the painting.³⁷ The complex evolution of Leonardo's compositions means that underdrawing and painting phases can no longer be separated. Nevertheless, the thin yellow-brown layer that appears beneath the layers of blue in a paint sample from the mantle of the Virgin (FIG. 15) in the Munich *Madonna of the Carnation* (see FIG. 35)³⁸ is strikingly similar in cross-section to the monochrome undermodelling of Verrocchio's tempera painting in the National Gallery (FIGS 16 and 17). Whether or not Leonardo used such an underpainting consistently across this small panel, the important point is that he shared with Verrocchio the conception of individual figures and figure groups in monochrome, thinking in terms of contour and tone (*disegno*) before colour. The older painter then counteracted this to some degree by his choice of local, high key colours typical of tempera painting, using a conventional palette and tonality. Leonardo, on the other hand, was to develop the deeper tonalities of the oil



FIG. 15 Paint cross-section of the Virgin's mantle from Leonardo da Vinci, *The Madonna of the Carnation* (FIG. 35) showing two layers of gesso (*gesso grosso* and *gesso sottile*) followed by an *imprimatura* containing lead white. Over this is a translucent brown layer, rich in medium, followed by a thin blackish layer and finally a layer of ultramarine and lead white.

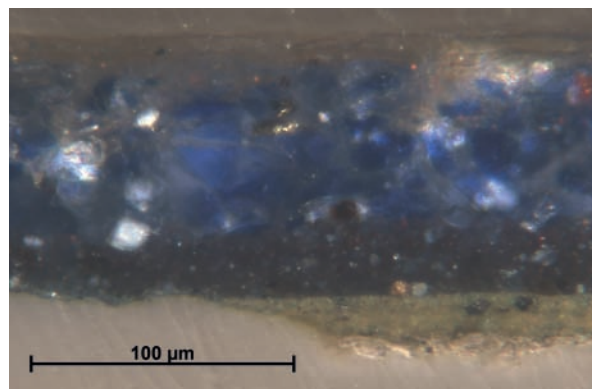


FIG. 16 NG 2508, paint cross-section of the Virgin's mantle, showing a trace of gesso and then the undermodelling layer containing mainly earth pigments with a little black and lead white. The blue layers consist of an underpainting of indigo with some lead white and finally a thick layer of ultramarine with lead white.



FIG. 17 NG 2508, photomicrograph of the Virgin's mantle, after cleaning before restoration.



FIG. 18 Andrea del Verrocchio and assistant (Lorenzo di Credi), *The Virgin and Child with Two Angels* (NG 296), c.1476–8. Egg tempera on panel, 96.5 × 70.5 cm.

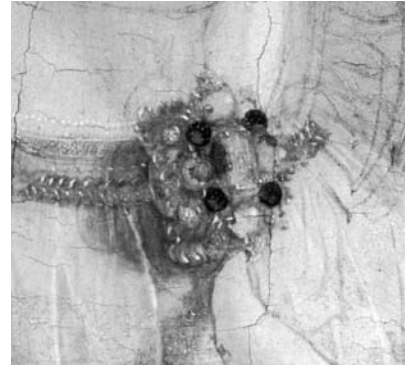


FIG. 20 NG 296, detail of infrared reflectogram.



FIG. 21 Leonardo da Vinci, *The Annunciation* (FIG. 19), detail of infrared reflectogram.



FIG. 19 Leonardo da Vinci, *The Annunciation*, about 1472–6. Oil and tempera on poplar, 100 × 221.5 cm. Florence, Galleria degli Uffizi, inv. 1618.



FIG. 22 NG 296, detail of infrared reflectogram.

medium to reduce the tonal contrasts inherent in a palette of pure pigments, working towards the unity of tone that he achieved in *The Virgin of the Rocks*.³⁹

Nevertheless, behind all Leonardo's innovations as a painter lies an approach to the first stages of making an underdrawing on the panel surface that has its origins in his training in the Verrocchio workshop. Now that several of his paintings have been examined by infrared methods, it has become evident that, perhaps contrary to expectations, the underdrawings revealed are neither elegant nor beautiful. Instead they appear entirely functional. The same applies to Verrocchio's underdrawing, particularly as displayed in the larger and later panel in the National Gallery of the *Virgin and Child with Two Angels*, painted in collaboration with Lorenzo di Credi

(FIG. 18).⁴⁰ This can be dated to around 1476, a few years after the probable date of Leonardo's Uffizi *Annunciation* (FIG. 19), widely accepted as his earliest independent commission and perhaps painted between about 1472 and 1474. In both, the drawing was executed with a brush and a liquid medium. Details such as the brooch of Verrocchio's angel and the pendant and beads sketched but not painted by Leonardo for the Virgin Annunciate, are similarly indicated by rapidly annotated little circles (FIGS 20 and 21). The abbreviated structure of the drapery folds as they fall across the knees of the respective Virgins is also directly comparable (FIGS 22 and 23). In the case of Leonardo's panel, the schematic nature of the interlocking triangular folds has led to the suggestion that some form of cartoon might have been transferred



FIG. 23 Leonardo da Vinci, *The Annunciation* (FIG. 19), detail of infrared reflectogram.



FIG. 24 NG 296, detail of infrared reflectogram.



FIG. 25 Leonardo da Vinci, *The Annunciation* (FIG. 19), detail of infrared reflectogram.



FIG. 26 NG 296, detail of infrared reflectogram.

to the painting surface.⁴¹ However, in both paintings the lines have a bold freehand quality and have clearly not been used as a guide for the painted folds. Instead, they should perhaps be understood as diagrammatic shorthand for the structure of the folds, which had been explored more fully in the highly worked drapery studies on paper or fine linen for which the Verrocchio workshop was famous.

In areas such as the hair of the angels (FIGS 24 and 25) the drawing also appears to be freehand, as might be expected. The sculptural coils of the locks of Verrocchio's angel (which become much fluffier in the painting) can be compared with the loosely drawn tendrils around the forehead of Leonardo's angel. These belong to the first underdrawing, unlike the dark heavy lines that define the spiralling curls, which appear to have been applied later in this complex and much reworked underdrawing and perhaps belong more properly to the painting process. The heads of both these exquisite angels must have been the subject of detailed studies. The simple clarity of the initial drawn contours – subsequently often adjusted – of the heads and hands of Leonardo's angel, and also his Virgin, suggests that he may have used cartoons to transfer the designs, although there is no indication of the transfer process. In the case of Verrocchio's panel, however, there is clear evidence for the transfer of cartoons for the heads and hands of all the figures, and the body of the Christ Child, using the technique of pouncing (FIG. 26). Pounce dots have been detected on the *Portrait of Ginevra de' Benci*, probably painted while he was still associated with the Verrocchio workshop (FIGS 27 and 33),⁴² and on



FIG. 27 Leonardo da Vinci, *Portrait of Ginevra de' Benci* (FIG. 33), detail of infrared reflectogram.

his later *Portrait of Cecilia Gallerani* ('*The Lady with an Ermine*') (Czartoryski Foundation, Cracow).⁴³ Well into his career Leonardo seems to have continued the Verrocchio workshop practice of making, and sometimes reusing, 'single element cartoons' for important details such as heads and hands.⁴⁴ That this was also the practice of his friend and fellow pupil Lorenzo di Credi is confirmed by the presence of pounce dots in the careful underdrawing for Lorenzo's *Virgin and Child* in the National Gallery (see FIG. 37), which was probably painted in the early 1480s, but it remains a characteristic example of Leonardo's technique.

The connection between Leonardo and Lorenzo di Credi raises the issue of the single most important difference between their painting techniques and that of their master: where and how did they learn to paint in oil? The National Gallery's larger *Virgin and Child with Two Angels* (FIG. 18) was perhaps the last of Verrocchio's excursions into painting, which were in any case probably always rare, completed shortly before he began to hand over the execution of painting commissions to Lorenzo, his technically gifted and faithful assistant.⁴⁵ In its finest passages it represents a virtuoso display of the qualities of the tempera medium, with its associated decorative gilding techniques, almost as if it was painted as a challenge to the newly fashionable oil painting. Although one might expect a sculptor who modelled clay with such vigour and freedom to have been attracted by the more malleable properties of oil paint, he seems to have remained faithful to the intractable egg medium, perhaps in part because the discipline of modelling by hatched strokes is close



FIG. 28 Antonio and Piero del Pollaiuolo, *The Martyrdom of Saint Sebastian* (NG 292), completed 1475, detail. Oil on panel, 291.5 × 202.6 cm.



FIG. 29 Leonardo da Vinci, *The Annunciation* (FIG. 19), detail of infrared reflectogram.

to the shading of drawings on paper. The painters who emerged from his workshop, whether famous names such as Botticelli, or more modest masters who are still unidentified, are generally distinguished by the high standard of craftsmanship of their tempera paintings. Drying oils had long been used for specific purposes in a tempera painter's workshop and in Florence there seems to have been an association between the oil medium and canvas supports which may go back at least to the early 1460s.⁴⁶ Nevertheless, if Leonardo wished to break



FIG. 30 Leonardo da Vinci, *The Madonna of the Carnation* (FIG. 35), detail.

with tradition, it was probably necessary to go elsewhere for suitable instruction.

The most obvious workshop for Leonardo to have visited is that of Verrocchio's great rivals, the Pollaiuolo brothers. Following their sensational production of the altarpiece for the Cardinal of Portugal's chapel, completed probably in 1467 and painted in oil on a panel of imported oak, they seem to have made a feature of using oil for their panel paintings. Their technique was often experimental and unorthodox, particularly as regards the preparation of panels for painting.⁴⁷ Piero, in particular, sometimes chose to paint on panels of cypress, not commonly used in Italy, without any gesso preparation. Leonardo listed cypress among the woods suitable for painting supports in his somewhat puzzling notes on of how to prepare panels for painting; it is possible that they contain a confused recollection of practice in the Pollaiuolo workshop.⁴⁸ In their use of oil paint the Pollaiuolo brothers were clearly attempting to imitate some of the effects to be seen in works by early Netherlandish painters, but they may not have had first-hand knowledge of their technique, unlike the Italian pioneers of oil painting in centres such as Naples, Ferrara, Venice and Urbino, who almost certainly had some contact with Northern European artists. In the larger scale oil paintings of the Pollaiuolo brothers, opaque colours, including flesh tints, are applied directly in a solid body colour. Indeed for a huge panels such as *The Martyrdom of Saint Sebastian* (NG 292) in the National Gallery, the long sweeps of the brushstrokes show how the brothers exploited the possibilities of oil paint for rapid coverage of large surface areas. In areas of red, green, blue and purple

they achieved colours of great depth and intensity in imitation of Netherlandish paintings, but the paint layers are often thick and raised. Piero in particular does not seem to have understood the need for building up deep colours by careful layering, which is especially necessary in the case of pigments that form slow-drying paints such as red lakes.⁴⁹ While two panels in Berlin generally assigned to Antonio (perhaps less radical in his technique than his brother) have been identified as painted in linseed oil, samples from the London altarpiece and Piero's *Annunciation* (Gemäldegalerie, Berlin) contain walnut oil, which makes slower drying paints.⁵⁰ All this helps to explain the areas of paint affected by defective drying of the oils that can be observed on their paintings, particularly those by Piero. Sometimes the paint surface appears to be blistered and bubbling, almost as if scorched (FIG. 28), while elsewhere the drying of the top surface in advance of the under-layers causes the paint to form wide open drying cracks.

Exactly the same drying defects can be seen on Leonardo's early oil paintings, and indeed continued to affect his output. *The Annunciation*, generally agreed to be the earliest, is apparently painted in oil throughout.⁵¹ Most of the paint surface is unaffected by drying problems, but in the Virgin's hair there are wide drying cracks (clearly visible in the infrared image; FIG. 29) of the type more commonly associated with eighteenth- and nineteenth-century paintings containing bituminous pigments.⁵² The small panel of *The Madonna of the Carnation* in Munich is disfigured both by drying cracks, mainly in the blue draperies, and by deformation and



FIG. 31 Andrea del Verrocchio and Leonardo da Vinci, *The Baptism of Christ* (FIG. 1), detail.

wrinkling of the paint surface, even in the flesh tints of the Virgin and Child, where the presence of lead white in the paint might be expected to prevent such defects (FIGS 30 and 35). Analysis has shown the paint medium to consist principally of walnut oil (also found later in the London *Virgin of the Rocks* – see p. 48 of this *Bulletin*).⁵³ The



FIG. 32 NG 292, detail.



FIG. 33 Leonardo da Vinci, *Portrait of Ginevra de' Benci*, c.1474/8. Oil on panel, 38.1 × 37 cm. Washington, DC, National Gallery of Art, INV. 1967.6.1.a.

appearance of the flesh tints suggests that the upper surface of the paint film had begun to dry (or set) faster than the underlying layers. These underlayers contained slow-drying materials, but Leonardo also seems to have added an unusually high proportion of medium to his paint in order to obtain smoothly blended tonal transitions.⁵⁴ Drying problems can also be caused by the excessive use of volatile diluents to thin the paint, but there is no real evidence that diluents were used for this purpose in the fifteenth century, and indeed the oil paint that Leonardo used for completing *The Baptism* in particular is visibly stiff and sticky. His use of oil in this painting has been described in terms that echo the technique of the Pollaiuolo brothers: it has been observed that the figure of Christ is painted 'con lievi stesure a mezzo corpo sfumate nell'impasto', the paint worked and blotted with his fingers, while broader areas such as the angel's draperies are painted with 'grande immediatezza ... quasi senza l'uso di velature finali'.⁵⁵ The lead white paint with which Leonardo added the extra water, the splashes and the ripples applied directly over the earlier landscape details painted in tempera, also has a distinct texture, the strokes of dense, somewhat stringy paint almost dragged across the panel surface (FIG. 31). Passages of lead white in *The Martyrdom of Saint Sebastian*, whether for white linen (FIG. 28) or for the water that pours over the weir in the background, are strikingly similar (FIG. 32).



FIG. 34 Leonardo da Vinci, *Portrait of Ginevra de' Benci* (FIG. 33), X-radiograph.

Only the *Portrait of Ginevra de' Benci* (FIG. 33) with its refined detail and perfectly smooth and evenly blended flesh tones, seems free of such technical problems.⁵⁶ In this painting Leonardo appears to be responding strongly to the Netherlandish portraits that were entering Florentine collections in ever greater numbers in the 1470s, in particular those by Hans Memling and Petrus Christus.⁵⁷ As a result, its execution comes closest to the immaculate technique of Lorenzo di Credi. Either they learnt the techniques of oil painting together, or more probably Leonardo transmitted them to his younger companion, who then applied to them the methodical and meticulous craftsmanship that made him such a valuable aide to Verrocchio. There can be no doubt that for a time Lorenzo was greatly under the influence of Leonardo, producing small paintings in oil such as the *Louvre Annunciation* and the *Madonna and Child with a Pomegranate (The Dreyfus Madonna)* (National Gallery of Art, Washington, DC) which have sometimes been attributed to Leonardo himself.⁵⁸ In this period Leonardo constructed the faces of his figures by laying in a very pale base colour containing a great deal of lead white while reserving details such as lips and mouth (established in the underdrawing), and then modelling the shadowed parts with delicate semi-translucent browns and pinks (the reverse of Verrocchio's tempera system, in which he works from the shadows towards the highlights). This results in a distinctive X-ray image in which the heads



FIG. 35 Leonardo da Vinci, *The Madonna of the Carnation*, c.1477–8. Oil on panel, 62 × 48.5 cm. Munich, Alte Pinakothek, inv. 7779.



FIG. 36 Leonardo da Vinci, *The Madonna of the Carnation* (FIG. 35), X-radiograph.



FIG. 37 Lorenzo di Credi, *The Virgin and Child* (NG 593), c.1480–5. Oil on panel, 71.1 × 49.5 cm.



FIG. 38 NG 593, X-radiograph.



FIG. 39 Workshop of Andrea del Verrocchio, *Tobias and the Angel* (NG 781), c.1470–5. Tempera on panel, 83.6 × 66 cm.

appear like a mask with openings for eyes and mouth (FIG. 34). The effect is exaggerated in the case of *Ginevra de' Benci* by the presence of the gesso and paint of the image on the reverse, but is also apparent in X-radiographs of *The Madonna of the Carnation* (FIGS 35 and 36) and other works, including the figure of the Baptist in *The Virgin of the Rocks* and a little later in the *Portrait of Cecilia Gallerani*.⁵⁹ The similar appearance of the heads in Lorenzo di Credi's National Gallery *Virgin and Child* (FIGS 37 and 38) is an indication that his method of constructing flesh tints was based on that of Leonardo.⁶⁰ Even though Lorenzo used similar materials, for example walnut oil,

as identified in the London *Virgin and Child*,⁶¹ his technique of carefully building up the colours in thin layers (well demonstrated by his unfinished *Virgin and Child* in the Ashmolean Museum, Oxford), means that his works remain free of the problems that affect those of the more experimental and less practical Leonardo.⁶²

Lorenzo di Credi's procedure when constructing drapery folds, for instance, was essentially closer to that of tempera painting, with pigments used at their purest and brightest in the shadows and then modelled up to the highlights by the admixture of increasing amounts of lead white (which also improved the drying properties



FIG. 40 NG 781,
infrared
reflectogram.

of the oil paints). The identification of Lorenzo's hand in the execution of the Christ Child and the angel on the right in Verrocchio's later *Virgin and Child with Two Angels* (FIG. 18) confirms that he had been trained to the highest level as a tempera painter.⁶³ The question then arises as to whether it is possible to recognise any surviving early efforts by Leonardo in that medium.

It has been proposed that the most likely candidate for an intervention by Leonardo in a Verrocchio workshop product is the National Gallery's *Tobias and the Angel* (FIG. 39), with the attribution to him initially of just the fish and the dog (FIGS 50 and 51),⁶⁴ but more recently

of much of the figure of Tobias.⁶⁵ Generally dated to the early 1470s, this panel is clearly a product of the Verrocchio workshop. The figures are on a notably smaller scale than those in other works that can be assigned to Verrocchio himself, but for all their gaiety and charm they display weaknesses of design that suggest that he was not directly responsible for them. The figure group lacks the sculptural qualities of *The Baptism* and the two Virgin paintings in the National Gallery; instead two individually studied figures have been brought together and arranged across the picture plane in order to fill the available space.⁶⁶ Raphael's draperies are bulky but not three-dimensional,

and the fluttering edges of his skirt and Tobias's cloak may suggest movement, but they also form shapes that draw attention to the picture surface rather than the volume of the figures.

Infrared reflectography has revealed an elaborate underdrawing (FIG. 40), which is not noticeably like that to be found in either of the National Gallery's panels by Verrocchio. The simple schematic outlining, with a brush and a liquid medium, of the heads, hands and feet (the outlines not always followed in the painting) suggests that these details were transferred, perhaps by tracing since no pounce dots can be detected, or that they were scaled up or down from detailed studies on paper. These studies must have included a drawing for the hand with bent fingers and protruding thumb which appears in other products of the Verrocchio workshop⁶⁷ and was perhaps studied from a plaster model; here it is rather unintelligently used twice. The padded pleats of Tobias's tunic are all carefully, if clumsily drawn, but the underdrawing for Raphael's draperies – where it can be detected through the paint layers – appears more improvised and indeed somewhat chaotic. Some rough parallel hatching is visible in the angel's cloak where it is turned back over his shoulder, and there is a suggestion of wash undermodelling which would not be surprising in this instance. Most of the underdrawing is obscured, however, by the black pigment used in the grey of the angel's tunic and also, more unusually, as a monochrome underpaint for the pink outer side of his cloak. Presumably this was to give it a purple cast.⁶⁸

As in all products of the Verrocchio shop the execution of detail is refined, especially in the depiction of the cloth-of-gold fabrics. It has been suggested that there is a difference between the two figures in the application of the gold highlights, and that the more broken and flickering touch on the Tobias is indicative of Leonardo's handling.⁶⁹ If there is a difference, it may be explained by the greater complexity of the pattern on Tobias's sleeve; moreover, the broken highlights on the sleeve of Verrocchio's angel in the early National Gallery panel (FIG. 2) are equally 'Leonardesque'. Also, the fact that tempera paint has been used to represent the gold trimming along the edge of the skirt of Tobias's tunic, while the hem of Raphael's cloak is decorated with mordant gilding, is not a significant distinction, since Verrocchio himself used yellow pigments for all the golden trimmings on the early National Gallery *Virgin and Child with Two Angels* and both yellow paint, mordant gilding and mosaic gold on the later one.⁷⁰



FIG. 41 Attributed to Pietro Perugino, *Saint Anthony and Saint Sebastian*, c.1473–5. Tempera on panel, 74 × 50 cm. Nantes, Musée des Beaux-Arts, inv. 62.

The names of other painters as well as Leonardo have been linked with this painting, among them that of Pietro Perugino, the third of the three young artists who studied together, if Vasari is to be believed.⁷¹ There have been several attempts to reconstruct Perugino's beginnings and one of the reasons for linking him with *Tobias and the Angel* is a superficial resemblance to a panel on a similar scale, clearly the side panel of a small altarpiece, showing *Saint Anthony and Saint Sebastian* (Musée des Beaux-Arts, Nantes), which is believed by many to be one of his earliest works (FIG. 41).⁷² The saints are set against a gold ground incised with a large-scale damask pattern; such backdrops are more typical of Umbrian and Marchigian paintings than those made in Florence in the 1470s. Yet the painter evidently had knowledge of Verrocchio workshop products of around the time of the *Tobias and the Angel*. It has been observed that the pose of Saint Sebastian echoes that of Verrocchio's bronze David; he has the jaunty air of Tobias and also wears red stockings and a green lined cloak, flung over his shoulder as in so many Verrocchiesque paintings; other details, such as Saint Anthony's hand



FIG. 42 Attributed to Pietro Perugino, *Saint Anthony and Saint Sebastian* (FIG. 41), detail.



FIG. 43 Italian, Umbrian, *The Virgin and Child* (NG 2483), c.1473. Tempera on panel, 48.3 × 36.8 cm.

holding the book, and his somewhat distorted left foot, also echo those of Raphael in the London panel. The Nantes panel is a classic tempera painting (not in oil as reported in the recent literature),⁷³ but close examination shows that the tempera is handled rather differently from other Verrocchio workshop products. The flesh painting, in particular, is distinctive, with the tempera hatched on in unusually long fluid strokes over a cool green earth underlayer, which is considerably darker than that on *Tobias and the Angel*. For the youthful Saint Sebastian the flesh tints are built up almost entirely in strokes of pink and white (FIG. 42). The brownish, *verdaccio* phase of modelling that plays such an important part in the flesh tints of the Tobias and other panels associated with Verrocchio is absent. The vertical tendency of the tempera hatching occasionally causes difficulties in areas where different planes meet, in particular the modelling of the brow bone at the outer corner of Saint Sebastian's left eye, where the hatched strokes shorten but retain their verticality, shading the eye socket in a distinctive and somewhat clumsy way. Exactly the same quirk of modelling can be seen on the face of the Virgin, also painted with long strokes of pink and white over a cool green earth, in a little panel in the National Gallery,

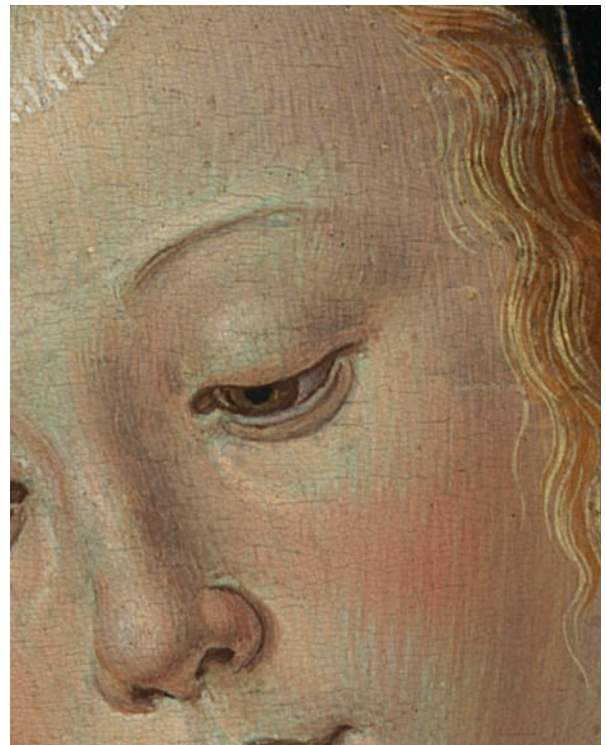


FIG. 44 NG 2483, detail.



FIG. 45 NG 781, detail.

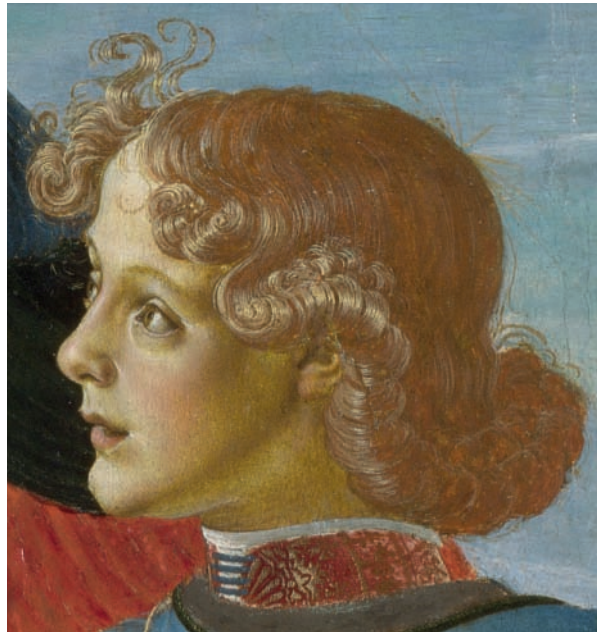


FIG. 46 NG 781, detail.

previously attributed to Fiorenzo di Lorenzo and currently catalogued as Umbrian School (FIGS 43 and 44).⁷⁴ In addition, the expressions of the Christ Child and that of Saint Anthony are strangely similar. Other technical links that suggest that they are by the same hand include an underdrawing – visible with the naked eye in places on both panels – that includes areas of regular widely spaced parallel hatching, and a simple technique for decorated gold fabrics in which mordant gilded patterns are laid over a flat reddish-brown base colour; this appears on Saint Sebastian’s sleeves and the Virgin’s sash in the London panel. The gilding and the blue paint of her mantle is a nineteenth-century restoration. If this painter is indeed Perugino,⁷⁵ then he can probably be ruled out as one of the painters of *Tobias and the Angel*. On the other hand, his early career still remains far from certain and there are other connections between Verrocchio and painting in Umbria that need further investigation.

Another name that has been linked with the painting is that of Francesco Botticini, although he seems to have been acting as an independent master by 1471–2, the date of the Uffizi *Three Archangels*, painted in a style and technique that reflects more closely that of Verrocchio’s early National Gallery panel.⁷⁶ Yet the heads in *Tobias and the Angel* (FIGS 45 and 46), with their appealing sweetness of expression, do not exhibit the irregular features which generally characterise Botticini’s own inventions. The impression that they might be by



FIG. 47 Andrea del Verrocchio, *Study for the Head of an Angel*, c.1472. Black chalk or charcoal, pen and ink, pricked for transfer, on paper, 21 × 18.1 cm. Florence, Uffizi, Gabinetto Disegno e Stampe, inv. 130E.

two different painters is almost certainly the result of differences in condition; Raphael’s face is badly rubbed, particularly on the shadowed side. The modelling of his nose, including the passage where a shadow falls across its bridge, gives some idea of its lost original quality, a quality



FIG. 48 Andrea del Verrocchio and workshop, completed by Leonardo da Vinci, *The Baptism of Christ* (FIG. 1), detail.

that is not apparent in the disappointing and somewhat summary painting of the landscape, for example. An unknown workshop member might have been capable of such painting, especially if copying drawings supplied by Verrocchio, perhaps close in technique and style to his highly worked *Head of an Angel* (FIG. 47).⁷⁷ Or are the heads indeed painted by another artist? Just as with the identification of Lorenzo di Credi's part in the execution of the later *Virgin and Child with Two Angels* (FIG. 18), the standardised painting technique cannot supply the clues. In that instance, it was the delegation to Lorenzo of the design as well as the execution of his part of the composition that made him recognisable. This is not the case with *Tobias and the Angel*. Nevertheless, a small feature of the painting of the heads should be pointed out: this is the addition of a fine highlight forming a bow shape along the outer edge of the lower lip, particularly evident on the more worn head of Raphael. Verrocchio himself does not ever seem to have emphasised the lower lip in this way, but a similar highlight appears on the mouth that Leonardo added to the San Salvi angel (FIG. 9), and on that of Christ (FIG. 48), and continues to feature in later paintings, most notably in the mouth of the infant Baptist in the London *Virgin of the Rocks*.

Whether Leonardo assisted in the execution of *Tobias and the Angel* remains an open question. Even if he did paint the two faces, it does not necessarily mean that he



FIG. 49 Andrea del Verrocchio and workshop, completed by Leonardo da Vinci, *The Baptism of Christ* (FIG. 1), detail.



FIG. 50 NG 781, detail.



FIG. 51 NG 781, detail.

should be credited with the painting of the beautifully observed fish and lively little dog (FIGS 50 and 51), both added over the completed figures and landscape. It is just as likely that Verrocchio, as master of the workshop, made the final contributions to the panel. That he was capable of making observant studies of nature in his paintings as well as his sculpture⁷⁸ is confirmed by the bright-eyed raptor that swoops down over the head of the Baptist in an area of the San Salvi altarpiece that is part of the first campaign (unless one argues for Leonardo's previous involvement in the painting) (FIG. 49). The dog is painted with remarkable speed and confidence; it has the forward-moving energy that was later to characterise the horse in Verrocchio's great Colleoni monument, and the way that its shaggy coat forms rows of clumped curls is similar to his rendition of hair in his sculptures and earlier paintings – especially the forward-facing angel in *The Virgin and Child with Two Angels* (FIG. 2).⁷⁹ It is important never to underestimate the painting skills of Verrocchio, who by his own example and through his many pupils and followers, turns out to be not only the most important sculptor, but arguably also the dominant figure in Florentine painting of the later part of the fifteenth century.

Acknowledgements

This is the last of three articles resulting from research into Verrocchio's work as a painter which has been carried out with Luke Syson. Much of it is based on shared observations and I am very grateful to him for his input and for his comments on the text. In the previous articles we acknowledged our indebtedness to a great many scholars; their contributions remain applicable to this article. However, I would particularly like to thank Adeline Collanges at the Musée des Beaux-Arts, Nantes, for making available for study the Musée's panel attributed to the young Perugino, and Andrew Butterfield, Cecilia Frosinini, Heike Stege and Elizabeth Walmsley for comments on the text or help in obtaining images. The infrared reflectograms of the National Gallery paintings were supplied by Rachel Billinge.

This article is available for download at:
<http://www.nationalgallery.org.uk/technical-bulletin/dunkerton2011>

Notes

- 1 For the most recent biographies of Leonardo, which deal briefly with his early years, see L. Syson, 'The Rewards of Service: Leonardo da Vinci and the Duke of Milan' in L. Syson et al., *Leonardo da Vinci: Painter at the Court of Milan*, exh. cat., National Gallery, London 2011, esp. pp. 15–18; F. Zöllner, *Leonardo da Vinci: The Complete Paintings and Drawings*, Hong Kong 2003 (revised edn 2007), pp. 10–38 and P. Marani, *Leonardo una carriera di pittore*, Milan 1999, pp. 12–75. For the fullest accounts of Leonardo's early years see D.A. Brown, *Leonardo da Vinci: Origins of a Genius*, New Haven and London 1998, and F. Windt, *Andrea del Verrocchio und Leonardo da Vinci Zusammenarbeit in Skulptur und Malerie*, Beiträge zur Kunstgeschichte der Mittelalters und der Renaissance, Vol. 11, Münster 2003.
- 2 For Verrocchio's biography see A. Butterfield, *The Sculptures of Andrea del Verrocchio*, New Haven and London 1997, pp. 2–7, and D.A. Covi, *Andrea del Verrocchio: Life and Work*, Florence 2005, 5–16.
- 3 The only other early biographical source mentioning Leonardo's early years is the anonymous early sixteenth-century writer, the so-called Anonimo Gaddiano who (amplifying the brief account in *Il libro di Antonio Billi*), claims that Leonardo spent time in Lorenzo de' Medici's sculpture garden at San Marco; C. Frey, *Il Codice Magliabechiano*, Berlin 1892, p. 110.
- 4 'E in questa opera aiutandogli Lionardo da Vinci, allora giovanetto e suo discepolo, vi colori un Angelo di sua mano, il quale era molto meglio che l'altre cose; il che fu cagione che Andrea si risolvette a non volere toccare più pennelli, poichè Lionardo così giovanetto in quell'arte si era portarto molto meglio di lui.' G. Vasari (ed. R. Bettarini), *Le vite de più eccellenti pittori, scultori e architettori*, Verona 1971, III, p. 539.
- 5 Vasari (ed. Bettarini) 1971 (cited in note 4), IV, pp. 16–7.
- 6 L. Beltrami, *Documenti e memorie riguardanti la vita e le opere di Leonardo da Vinci*, Milan 1919, p. 2, doc. 3.
- 7 'Fu compagno, caro amico e molto domestico di Lionardo da Vinci, che insieme, sotto Andrea del Verrocchio, lungo tempo impararono l'arte'; and 'Cresciuto dunque l'animo a Lorenzo, si pose con Andrea del Verrocchio, che allora per un suo così fatto umore si era dato al dipingere; e sotto lui, avendo per compagni e per amici, se bene erano concorrenti, Pietro Perugino e Lionardo da Vinci, attese con ogni diligenza la pittura.' See Vasari (ed. Bettarini) 1971 (cited in note 4), IV, p. 299.
- 8 His membership does not necessarily mean that he was already a fully trained and qualified painter. See Brown 1998 (cited in note 1), p. 75. In addition, 1472 is not necessarily the date that he joined the *compagnia*, since this date represents only the year of the compilation of the list of members, many of whom must have belonged previously. I am grateful to Scott Nethersole, who has recently rechecked this document, for clarification of this point.
- 9 See, for example, H. Chapman and M. Faietti, *Fra Angelico to Leonardo: Italian Renaissance Drawings*, exh. cat., British Museum, London 2010, pp. 65–7; C.C. Bambach in C.C. Bambach (ed.), *Leonardo da Vinci: Master Draftsman*, exh. cat., Metropolitan Museum of Art, New York, New Haven and London 2003, pp. 242–55; J.K. Cadogan, 'Linen Drapery Studies by Verrocchio, Leonardo and Ghirlandaio,' *Zeitschrift für Kunstgeschichte*, vol. 46, no. 1 (1983), pp. 27–62.
- 10 In his letter of introduction written in the early 1480s to Ludovico Sforza, Leonardo claimed 'I can carry out sculpture in marble, bronze or clay...'; see Syson 2011 (cited in note 1), pp. 20–21.
- 11 See, for example, Brown 1998 (cited in note 1), pp. 58–67; G. M. Radke, *Leonardo da Vinci and the Art of Sculpture*, exh. cat., High Museum of Art, Atlanta, and J. Paul Getty Museum, Los Angeles, New Haven and London 2009, but see also review by A. Butterfield, *The Burlington Magazine*, CLII, August 2010,

- pp. 570–1. For other suggestions see also Windt 2003 (cited in note 1), pp. 114–26.
- 12 Brown 1998 (cited in note 1) and others.
 - 13 See A. Bernacchioni, 'Le Botteghe di Pittura: Luoghi, Strutture e Attività', pp. 23–33, and A. Padoa Rizzo, 'La Bottega come Luogo di Formazione', pp. 53–9, in C. Acidini Luchinat (ed.), *Maestri e botteghe. Pittura a Firenze alla fine del Quattrocento*, exh. cat., Palazzo Strozzi, Florence 1992. For the fluctuating staffing levels and discussion of the nomenclature of various workshop assistants in Neri di Bicci's busy but far from prestigious bottega, see A. Thomas, *The Painter's Practice in Renaissance Tuscany*, Cambridge 1995, pp. 81–93.
 - 14 For painters passing through Lippi's workshop, see A. di Lorenzo, 'Regesto fiorentino' in M. Ceriana, K. Christensen, E. Daffra and A. De Marchi (eds), *Fra Carnevale. Un artista rinascimentale da Filippo Lippi a Piero della Francesca*, exh. cat., Pinacoteca di Brera, Milan, and Metropolitan Museum of Art, New York 2004–5, pp. 290–302.
 - 15 See L. Keith, 'In Pursuit of Perfection: Leonardo's Painting Technique' in L. Syson et al. 2011 (cited in note 1), pp. 54–77. See also note 48 of this article.
 - 16 See A. del Serra, 'L'incanto dell'Annuncio: rendiconto di restauro'; R. Bellucci, M. Cetica, E. Pampaloni, L. Pezzati and P. Poggi, "La prospettiva è briglia e timone della pittura ..." Analis agli infrarossi e ricostruzione geometrica'; and O. Casazza, F. Ciattini, M. Fioravanti and R. Rimaboschi, 'Indagini sul supporto ligneo e osservazioni tecniche sul colore', in *L'Annunciazione di Leonardo: La montagna sul mare*, A. Natali (ed.), Florence 2000, pp. 95–127; E. Gibson, 'Leonardo's Ginevra di Benci: The restoration of a renaissance masterpiece', *Apollo*, vol. 133, 1991, pp. 161–5, and J. Schmidt and H. Stege, '»Wie man eine gute Malerie erkennen soll, und welche Eigenschaften sie haben muss, um gut zu sein. » Zur maltechnischen Ausführung', pp. 121–53; J. Koller and U. Baumer, '»Er {...} erprobte die seltsamsten Methoden, um Öle zum Malen [...] zu finden. » Leonards Rolle in der frühen italienischen Ölmalerie', pp. 155–74; H. Stege, '»Es ist nicht immer gut, was schön aussieht. » Untersuchungen zu den Farbmitteln', pp. 175–97, in C. Syre, J. Schmidt and H. Stege (eds) *Leonardo da Vinci: Die Madonna mit der Nelke*, Munich 2006.
 - 17 Summarised by Covi 2005 (cited in note 2), pp. 173–214. See also J. Dunkerton and L. Syson, 'In Search of Verrocchio the Painter: The Cleaning and Examination of "The Virgin and Child with Two Angels"', *National Gallery Technical Bulletin*, 31, 2010, pp. 4–41, and www.nationalgallery.org.uk/upload/pdf/Dunkerton_Syson_2010b.pdf.
 - 18 A. Natali, 'Lo sguardo degli angeli', pp. 61–94; A. Del Serra, 'Il restauro', pp. 95–118; O. Casazza, M. Noferi, R. Rimaboschi, 'Studi sul supporto ligneo e osservazioni sul Battesimo di Cristo', pp. 119–28, in A. Natali (ed.), *Lo sguardo degli angeli. Verrocchio, Leonardo e il "Battesimo di Cristo"*, Milan 1998. See also A. Natali, *Leonardo: Il giardino di delizie*, Milan 2002, pp. 15–24.
 - 19 L. Syson and J. Dunkerton, 'Andrea del Verrocchio's first surviving panel painting and other early works', *The Burlington Magazine*, CLIII, 1294, 2011, pp. 368–78.
 - 20 Further aids in distinguishing between the two phases of execution are the newly available very high resolution digital images of *The Baptism* (and also Leonardo's *Annunciation*), which allow for a degree of magnification of the paint surface previously only achievable with a stereobinocular microscope: www.haltadefinizione.com/magnifier.
 - 21 See Syson and Dunkerton (cited in note 19). Indigo has been reported as an underpaint for azurite in a Virgin and Child attributed to Botticelli in the Musée Jacquemart-André, Paris, and another Madonna by Neri di Bicci of about 1450–60 in Avignon; see E. Martin and S. Bergeon, 'Des bleus profonds chez les Primitifs italiens', *Techné*, 4, 1996, pp. 74–89, esp. pp. 82–3.
 - 22 Del Serra (cited in note 18), p. 99. Among paintings in the National Gallery, a similar extreme fading of red lakes in tempera has occurred on the draperies of angels in Filippo Lippi's *Saint Bernard's Vision of the Virgin* (NG 248) and Pesellino's *The Trinity with Saints Mamas, James, Zeno and Jerome* (NG 727, NG 3162, NG 3230, NG 4428 and L15) (completed by Filippo Lippi and workshop); see D. Gordon, *National Gallery Catalogues. The Fifteenth Century Italian Paintings*, Vol. 1, National Gallery London 2003, pp. 134–5 and p. 264. For a possible association between Verrocchio and the Lippi workshop, see Syson and Dunkerton (cited in note 19), esp. pp. 372 and 378.
 - 23 See Dunkerton and Syson 2010 (cited in note 17), pp. 26–34.
 - 24 See Syson and Dunkerton 2011 (cited in note 19), p. 377.
 - 25 See Natali 1998 (cited in note 18), p. 66, for an image of *The Baptism* with coloured overlays to indicate areas identified by surface examination as being in tempera, in oil over tempera and oil alone. The latter areas, coloured yellow, comprise the upper half and legs of Christ and the whole of the angel on the left. It should be noted that no paint samples were taken and so cross-sections were not available for this study.
 - 26 In particular the peculiar modelling and anatomy of Christ's torso, especially at the base of neck and clavicles, gives a sense of the second painter trying to soften and render more painterly the linear character of the original design, which would have, as in the Baptist, placed more emphasis on external and internal contours.
 - 27 Reproduced in Casazza et al. in Natali 1998 (cited in note 18), p. 120.
 - 28 Del Serra in Natali 1998 (cited in note 18), p. 12, gives a very perceptive account of the difference between the first tempera stage and the completion in oil which to some extent contradicts the diagram cited in note 24. His text is somewhat ambiguous "Terzo elemento: se è vero che Leonardo ha eseguito l'angelo di sinistra e il paesaggio, sono altrettanto vere due cose: la prima è che l'angelo non era stato precedentemente dipinto a tempera (ma, con questa, poco più che disegnato a pennello), come dimostrato con certezza dalle lacune sui capelli. Quindi egli ha lavorato su di una traccia grafi ca preesistente: il tradizionale chiaroscuro quattrocentesco in verdaccio, a tempera."
 - 29 K. Clark, *Leonardo da Vinci*, revised edition, Harmondsworth, 1959, p. 24. A fragmentary drawing in Turin (Torino, Biblioteca Reale inv. 15635) is sometimes claimed to be Leonardo's preliminary study for the head of the angel (see Marani 1999 [cited in note 1], pp. 62–5), but is more usually assigned to a follower. The precision of the details, including the exact number of glass cabochons in the decorated band across the angel's shoulder suggest that the drawing is indeed a copy after the painting.
 - 30 The appearance of this face in the published X-radiograph (see note 27) is denser than that of the Baptist and the angel on the right, but so too are the hands of this angel, which is accepted as Verrocchio's. In addition, the exposure of the X-ray plates appears to be somewhat uneven.
 - 31 Faint lines of underdrawing for the heads have been reported (D. Bertani, M. Cetica and L. Pezzati, 'Lo scanner i.r.: un dispositivo per rifil ettografi a infrarossa ad alta risoluzione' in Natali 1998 [cited in note 18], pp. 129–33) and the curves and loops drawn in a liquid medium for the folds of the Baptist's cloak are clearly visible even to the naked eye. The schematic quality of the drawing might indicate some method of transfer from a cartoon, or the lines could be reinforcing an underdrawing sketched with a dry material which was then brushed away: they are similar in character to the incisions used to reinforce the very freely underdrawn folds of the Virgin's cloak in the early National Gallery panel. The infrared reflectogram of *The Baptism* has perhaps proved more useful for showing details of the first landscape, subsequently covered by Leonardo, and for emphasising the differences between the flesh painting in the figures of Christ and the Baptist. As noted by Bertani et al., the striking difference in infrared between

- Christ's feet suggests that Leonardo mainly reworked his right foot, leaving the left foot in a similar state to those of the Baptist (although thinly covered with oil paint to indicate the water). This is further evidence that the painting of this figure by Verrocchio had progressed to a considerable extent before it was abandoned.
- 32 A rare attempt to show an angel from behind, with wings emerging from draperies, occurs in Pesellino's *Trinity Altarpiece*. In his early *Virgin and Child with Two Angels* Verrocchio equips his angel with wings that are clearly artificial, made from strips of cut silk suspended from a gilded metal (or perhaps papier maché) mount.
- 33 This use of wash undermodelling may have been selective; for example the robes of the angel on the left in the later National Gallery *Virgin and Child with Two Angels* are modelled in this way, but it is not present elsewhere on the panel. There is no sign of any wash as part of the underdrawing in infrared images of the faded red lake draperies in *The Baptism*.
- 34 The only exception appears to be in his earliest painting, *The Annunciation*, where small areas of shading with parallel hatching (much of it not in Leonardo's usual left-handed, top left to lower right direction) can be seen in the drapery folds.
- 35 L. Syson and R. Billinge, 'Leonardo da Vinci's Use of Underdrawing in the "Virgin of the Rocks" in the National Gallery and "St Jerome" in the Vatican', *The Burlington Magazine*, 147, December 2005, pp. 450–63, esp. p. 457ff.; see also Syson et al. 2011 (cited in note 1), cat. 20, pp. 138–141, and Keith 2011 (cited in note 15) p. 58.
- 36 For discussion of the condition of *The Adoration of the Magi* and its implication for interpretation of the underdrawing and modelling, see M. Seracini, 'Indagini diagnostiche Sulla Adorazione dei Magi di Leonardo da Vinci' in *La Mente di Leonardo*, P. Galuzzi (ed.), exh. cat., Galleria degli Uffizi, Florence 2006 (reprinted 2009), pp. 94–101.
- 37 L. Keith, A. Roy and R. Morrison, 'Technique and the Context of Restoration', *Postprints of the National Gallery Technical Bulletin 30th Anniversary Conference*, M. Spring (ed.), London 2010, pp. 72–9, esp. p. 75 and p. 43 of this *Bulletin*. See also Keith 2011 (cited in note 15), pp. 54–77.
- 38 See Syre, Schmitt and Stege (eds) 2006 (cited in note 16), p. 163. The brown layer also appears over the white *imprimitura* in a sample from the brown background (illustrated on p. 140). The published infrared reflectogram (fig. 65, p. 30) is compromised to some extent by the discoloured varnish and retouching, but there is evidence of broad and wash-like underdrawing in the draperies, while the areas painted with ultramarine blue appear darker than might be expected, an indication that the underlayers are registering in the infrared image.
- 39 The seminal text on Leonardo's development of tonal unity is J. Shearman, 'Leonardo's Colour and Chiaroscuro', *Zeitschrift für Kunstgeschichte*, vol. 25, no. 1 (1962), pp. 13–47. See also Keith 2011 (cited in note 15), pp. 54–77.
- 40 Discussed more fully in Dunkerton and Syson 2010 (cited in note 17), pp. 22–4.
- 41 Bellucci et al. 2000 (cited in note 16), p. 119.
- 42 Gibson 1991 (cited in note 16), p. 164.
- 43 D. Bull, 'Two Portraits by Leonardo: Ginevra de' Benci and the Lady with an Ermine', *Artibus et Historiae*, vol. 13, no. 25 (1992), pp. 67–83, and D. Bull, 'analisi scientifiche' in *Leonardo: La dama con l'ermellino*, B. Fabjan and P. Marani (eds), Rome 1998, pp. 83–90.
- 44 Syson and Billinge 2005 (cited in note 35), p. 453 and pp. 456–8.
- 45 If it is accepted that the *Madonna di Piazza* was painted by Lorenzo di Credi, apparently entirely in oil, then the Louvre *Virgin and Child* would be the only other painting that has sometimes been attributed to Verrocchio and which would postdate the National Gallery panel. Different parts of the painting are painted in different media, but its damaged condition makes uncertain any attribution of the tempera parts to Verrocchio himself; see Dunkerton and Syson 2010 (cited in note 17), p. 40, note 95.
- 46 J. Dunkerton and A. Roy, 'Uccello's "Saint George and the Dragon": Technical Evidence Re-evaluated', *National Gallery Technical Bulletin*, 19, 1998, pp. 26–30, esp. p. 30, note 14.
- 47 A. Cecchi, 'The Conservation of Antonio and Piero del Pollaiuolo's Altarpiece for the Cardinal of Portugal's Chapel', *The Burlington Magazine*, CXXI, 1999, pp. 81–8; N.A. MacGregor and S. Freschi, 'Introduzione al restauro delle opere di Antonio e Piero del Pollaiuolo agli Uffizi' in A. Natali and A. Tartuferi (ed.), *La stanza dei Pollaiuolo. I restauri, una mostra, un nuovo ordinamento*, Florence 2007, pp. 73–85. See also A. Wright, *The Pollaiuolo Brothers: the Arts of Florence and Rome*, New Haven and London 2005, p. 204.
- 48 'Il legno sarà d'arcipresso o pero o sorbo o noce' (J. P. Richter, *The Literary Works of Leonardo da Vinci* compiled, translated and annotated by Jean Paul Richter, first published 1883, 3rd edition London 1970, Vol. I, p. 362). Some of the more apparently bizarre instructions for preparing panels that follow in this well-known passage may result in part from difficulties in transcribing Leonardo's original text, and indeed from Leonardo's own carelessness in jotting down his notes (these texts are no more than notes for a treatise on painting). As more is learnt about his painting technique and that of his followers some sentences begin to make more sense. The implication that the gesso layer can be omitted is interesting in the light of his possible experience in the Pollaiuolo workshop and the discovery that it is not present on some panels by close followers (see pp. 80–1 of this *Bulletin*). Leonardo can never have meant the constituents of the final *imprimitura* to be applied over the underdrawing (exactly as in *The Virgin of the Rocks* – see p. 43 of this *Bulletin*) to be '30 parti di uerderame e una di uerderame e 2 di giallo'. Quite apart from the repetition of the word *verdigris*, the colour of the priming would be improbable. If, however, the first 'uerderame' was a slip of the pen and 'biacca' (lead white) is substituted, then the phrase becomes plausible, especially since small amounts of *verdigris* have been found in the priming of three of the panels studied in this *Bulletin* (see p. 62 and p. 92). In addition the same primings contain lead-tin yellow, also present in the second *imprimitura* of *The Virgin of the Rocks* (see p. 43).
- 49 Samples of red lake from Piero's *Annunciation* (Gemäldegalerie, Berlin) do not include powdered glass, which often seems to have been added to red lake glazes in paintings of this period from all over Europe. It would have modified the properties of the paint and may, according to a number of historical treatises, have acted as a drier, although there is still some uncertainty as to whether this is possible from a chemical point of view. Although it was not found in Piero's painting, it has been detected in works from Urbino of around the same date by Justus of Ghent and Giovanni Santi. For occurrences and analyses of powdered glass and a discussion of the historical documentary sources see M. Spring, 'Pigments in sixteenth-century painting of the German School', in *The pictorial technique of Grünewald and his peers*, ed. P. Béguerie-De Paep and M. Menu, Musée d'Unterlinden, Colmar and C2RMF-CNRS, 2007, pp. 136–144; and M. Spring, 'Raphael's materials: Some new discoveries and their context within early sixteenth-century painting', in *Raphael's Painting Technique: Working Practices before Rome*, Proceedings of the Eu-ARTECH workshop organised by the National Gallery and Eu-ARTECH, London November 11th 2004, ed. A. Roy and M. Spring, *Quaderni di Kermes*, Nardini Editore, 2007, pp. 77–86.
- 50 See R. White and J. Pilc, 'Analyses of Paint Media', *National Gallery Technical Bulletin*, 14, 1993, pp. 86–94, esp. p. 86, and Koller and Baumer 2006 (cited in note 16), p. 170. Samples from Piero's *Annunciation* made available to the National Gallery were found to include large amounts of a later oil resin varnish, containing linseed oil; this made it impossible to confirm the oil type of the very small amount of paint in the sample by GC-MS.

- 51 This is the observation of its vastly experienced recent restorer – there has been no analysis of samples. See Del Serra 2000 (cited in note 16), p. 96.
- 52 Indeed Leonardo may sometimes have used a bituminous brown pigment, perhaps in his underpainting. In the case of *The Virgin of the Rocks* a translucent brown earth, probably Cassel earth, has been found (see p. 43 of this *Bulletin*). Asphaltum has been identified in the cracked brown paint in the foreground of *The Martyrdom of Saint Sebastian*; see White and Pilc 1993 (cited in note 50), p. 86.
- 53 Koller and Baumer 2006 (cited in note 16), pp. 162–9. The results of analysis of two small samples from the edge of the painting are complicated. In addition to the walnut oil, which is clearly the principal binder, small amounts of linseed oil were found in the upper blue layer. Leonardo might have added some linseed oil to his paints (and seems to have used linseed oil for the first white imprimatura layer) but another possibility is that it is present as a result of contamination by later oil-varnish layers. Traces of egg proteins were also reported, with the suggestion that they might be related to the preparation of the blue pigment.
- 54 Moreover, the additional walnut oil was not necessarily heat-bodied – such oils theoretically avoid or reduce drying defects. See Koller and Baumer 2006 (cited in note 16), p. 169. In common with the Pollaiuolo brothers, he seems not to have added powdered glass to his colours; none has been detected in the examination of samples from *The Virgin of the Rocks*. See also note 49.
- 55 Del Serra 2000 (cited in note 16), p. 116. Wright 2005 (cited in note 47), pp. 412–3, drew attention to the importance of *The Martyrdom of Saint Sebastian* for the young Leonardo.
- 56 See Gibson 1991 (cited in note 16), pp. 162–3 for the excellent state of preservation of the painting.
- 57 P. Nuttall, *From Flanders to Florence: the Impact of Netherlandish Painting, 1400–1500*, New Haven and London 2004, pp. 224–7.
- 58 P. Marani, *Leonardo. Catalogo Completo*, Florence 1989, pp. 28–9 and pp. 39–40, in which he gives both to Leonardo, citing previous attributions, and Marani 1999 (cited in note 1), pp. 18–22 and p. 68, attributing the Dreyfus Madonna to Leonardo and suggesting that *The Annunciation* is a collaboration between Leonardo and Lorenzo di Credi.
- 59 Reproduced in Bull 1992 and 1998 (cited in note 43).
- 60 L. Fornasari, 'Andrea del Verrocchio e le botteghe toscane: l'atelier del Rinascimento' in L. Fornasari and C. Starnazzi (eds), *Leonardo e dintorni: il Maestro, le botteghe, il territorio*, exh. cat., Palazzo del Comune, Arezzo, Florence 2001, pp. 11–90, esp. pp. 18–24, which includes interesting details of the X-radiograph (the heads of the Virgin and Saint Donatus).
- 61 GC-MS analysis by David Peggie of samples from the Virgin's blue mantle and the brown of the background identified heat-bodied walnut oil in both cases. The use of such oils may have helped to avoid drying defects and may also have allowed Lorenzo to achieve his typically smooth, almost enamelled paint surfaces.
- 62 Fortunately, Florentine painters of the later fifteenth century who took up painting in oil seem, for the most part, to have followed the path of Lorenzo rather than Leonardo.
- 63 There is no real technical difference between Lorenzo's handling of the tempera medium and that of Verrocchio himself. See Dunkerton and Syson 2010 (cited in note 17), pp. 26–7.
- 64 W. Suida, 'Leonardo's Activity as a Painter' in Leonardo, *Saggi e Ricerche*, 1954, pp. 313–29, esp. 317.
- 65 Brown 1998 (cited in note 1), pp. 47–56.
- 66 The paint at the left and right edges seems to be later, but may reflect the original format. It appears different in the X-radiographs as well as the infrared images; during the last restoration in 1966 it was decided to leave it in place. See Treatment Report in the National Gallery Conservation Record.
- 67 The pose makes its first and most convincing appearance in the hand of the Virgin holding the Child's leg in Verrocchio's Berlin *Seated Virgin and Child* of around 1470.
- 68 Judging by the dark appearance of the angel's dark red cloak in the infrared reflectogram of *The Annunciation*, Leonardo himself may have used such an underpainting when working in oil.
- 69 Brown 1998 (cited in note 1), pp. 54–5. In both textiles the hatched highlights are 'left handed', but so too are some of the yellow highlights on Verrocchio's earlier *Virgin and Child with Two Angels*.
- 70 Dunkerton and Syson 2010 (cited in note 17), pp. 15–19.
- 71 Most recently and citing earlier suggestions, T. Henry, 'La formazione di Pietro Perugino' in *Perugino il divin pittore*, V. Garibaldi and F.F. Mancini (eds), Galleria Nazionale dell'Umbria, Cinisello Balsamo, Milan 2004, pp. 77–9.
- 72 See P. Scarpellini, 'Riflessioni sugli esordi di Perugino' in Garibaldi and Mancini 2004 (cited in note 71) pp. 50–1, and cat. no. 1.15, p. 202.
- 73 For example, Garibaldi and Mancini 2004 (cited in note 71), p. 202.
- 74 For the tentative attribution to Fiorenzo di Lorenzo see M. Davies, *National Gallery Catalogues. The Earlier Italian Schools*, rev. edn., London 1961, pp. 182–3. Other attributions, most recently to Pintoricchio, perhaps with the collaboration of Bartolomeo Caporali, have also been suggested; see V. Garibaldi and F. Mancini (eds), *Pintoricchio*, exh. cat., Perugia, Galleria Nazionale di Umbria, 2008, p. 234, cat. no. 35.
- 75 Perugino could still have been the painter of both these panels, since links have recently been pointed out between the *Virgin and Child* and the parts of the San Bernardino series of panels that have often been attributed to the young Perugino. Francis Russell (verbal communication to Luke Syson), F. Russell, 'Pintoricchio in Dreamland', *Apollo*, 167, no. 554, May 2008, pp. 98–101 (review of the 2008 Perugia exhibition).
- 76 The summary quality of the landscape would be consistent with an attribution to him, and it has been observed that the massive bunching of the draperies over Raphael's hips is also a feature of Botticini's many angels, admittedly mostly seated, in his huge panel of *The Assumption of the Virgin* painted in 1475–6 for Matteo Palmieri; see J. Dunkerton, S. Foister, D. Gordon and N. Penny, *Giotto to Dürer. Early Renaissance Painting in the National Gallery*, New Haven and London 1991, p. 314.
- 77 For discussion of the loose connections between this drawing, which may have functioned as a workshop pattern rather than a cartoon, and the angels in both *Tobias and the Angel* and also perhaps *The Baptism*, see the catalogue entry by Patricia Rubin in P.L. Rubin and A. Wright, *Renaissance Florence: the Art of the 1470s*, exh. cat., National Gallery, London 1999, pp. 170–1, cat. 22.
- 78 Further evidence in a painting might be the carefully observed fruiting bodies or cones of the cypress tree on the left in *The Virgin and Child with Two Angels*, while in Verrocchio's sculpture the obvious example is the astonishing rendition in bronze of various forms of fruit, including acorns, some with empty cups, and foliage in the wreaths on the tomb of Giovanni and Piero de' Medici in the Old Sacristy at San Lorenzo, Florence. See Butterfield 1997 (cited in note 2), pp. 44–9. On the other hand, it has been argued that this naturalistic observation is evidence of Leonardo's involvement in the tomb, although from the starting point of the attribution to him of the fish and dog in the National Gallery painting; see Brown 1998 (cited in note 1), pp. 64–7.
- 79 The curls still tend to form rows in the hair of the Child in Verrocchio's *Ruskin Madonna*, datable to about 1472–4, see Dunkerton and Syson 2010 (cited in note 17), p. 41, note 110.