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The small canvas of *A Boy with a Bird* (NG 933; Plate 1) that entered the National Gallery with the Wynn Ellis Bequest in 1876 appears to be an extract of a detail from the so-called ‘two-dog’ type of Titian’s *Venus and Adonis*, known from versions in Washington (Plates 2 and 3) and New York, both of which are generally dated to the 1530s or 1540s. However, the paint handling of the boy in the National Gallery picture is characteristic of work by Titian and his studio in the 1520s and the colour range also suggests this period. This apparent contradiction led earlier scholars to conclude that it was a later pastiche of Titian, probably dating from the seventeenth century. The study of sources for the composition, and detailed technical examination following the recent cleaning of the painting, have led the present authors to reassess the work.

### The composition and its sources
The painting was catalogued by Cecil Gould as follows:

A copy (with the omission of the wings), of the figure of Cupid which occurs in the background of the later versions (e.g. at Washington and New York) of Titian’s *Venus and Adonis*. The outline of the leaves has been altered to suit the smaller format and the clouds added of a type recalling an earlier phase of Titian’s style than the Washington and New York versions. Such a transformation would not be inconsistent with the methods of a later pasticheur and need not imply that there was ever a Titian original exactly corresponding with no. 933 in size and format. The handling of no. 933 – so far as it is at present possible to judge it – seems to be of the seventeenth century, although the attribution to Padovanino [made in the 1929 catalogue] seems too precise to justify.1 Gould laid out the problem with characteristic clarity and his conclusion has remained unquestioned. However, for a pastiche this little picture – or one ‘exactly corresponding with’ it – enjoyed unusual authority: at least four other versions or copies of it exist or are recorded, including a same-size canvas published by Suida in 1932 as an autograph Titian of the 1520s (Fig. 1) and a lost replica by Padovanino in the collection of Charles I of a lost variant by Titian in which Cupid held ‘two pigeons’.2 Furthermore, it seems odd that a pasticheur of the early seventeenth century should copy a figure from a late Titian in a style reminiscent of his early work. Such ingenuity does not fit the intellectual profile of any pasticheur that I know of, least of all Padovanino (1588–1648).

A preliminary check of *A Boy with a Bird* found nothing that suggested the seventeenth century, still less Padovanino. The painting indeed seemed to come from ‘an earlier phase of Titian’s style than the Washington and New York versions’ and the quality appeared reasonable if not outstanding, although it was too dirty to form more than an impression. An X-ray photograph (see Fig. 4), however, showed several pentimenti including the suppression of the wings that originally sprouted from the boy’s shoulders, and, more surprisingly, an earlier composition known in more detailed form in the famous woodcut of the *Landscape with a Milkmaid and a Youth feeding Animals*, generally attributed to Niccolò Boldrini working to Titian’s design and dated to the 1520s or 1530s (see Fig. 6).3 The woodcut is not much smaller than the National Gallery canvas (in its final dimensions) and there is independent evidence that a painted version of this Georgic composition once existed.4 The presence of this first composition confirmed that the *Boy was not* a fragment cut from a larger painting but originated as a self-sufficient extract – of about the same size as the prototype – from a pre-existing composition.5

Of course, such results do not establish authorship but the rational choice is between Titian and his studio. In favour of studio execution is the relatively modest quality of *A Boy with a Bird*; in favour of Titian are its confident and rapid execution, and the pentimenti. I tend to think that although slight and casual, the *Boy* is an autograph work, perhaps ‘knocked off’ – as Whistler would have said – as a gift or to earn small change; those with a more purist view of Titian will no doubt assign it to an assistant.
plate 1  Titian or Titian workshop (?), A Boy with a Bird (NG 933), probably 1520s. Canvas, 37 x 49.8 cm (dimensions of stretcher). Before cleaning.

plate 2  Detail of plate 3.
As mentioned above, the *Boy* is a modified extract from the two-dog canvas of *Venus and Adonis*, and we therefore need to look briefly at Titian’s treatments of this theme. *Venus and Adonis* came in two types. In one (for example [Plate 3](#plate3)), Adonis has two hunting-dogs on his leash, while at the left an alert Cupid clutches a dove protectively. In the other, Adonis has three dogs and a slightly older Cupid reclines in fore-shortened somnolence. The two-dog type is known in the original or in copies at two sizes (107 × 133 cm and 123 × 150 cm) but even the larger of these is much smaller than any version of the three-dog design, whose heights vary between 160 and 200 cm – with consequent adjustments to the height of Adonis – but whose widths remain fairly constant at 190–200 cm.

Titian’s most famous and only documented treatment of *Venus and Adonis* is the example of the large three-dog type that he sent to Philip II in 1554, now in the Prado ([Plate 4](#plate4)). As a consequence of that painting’s fame, it is widely assumed to be Titian’s first representation of the subject. However, although it is the three-dog type with sleeping Cupid that has come to be seen as canonical, it is clumsy as an arrangement. Two of the hunting-dogs are identical in pose to those in the smaller type, but the pose and position of the third is complicated and difficult to decipher; it gives the impression of being added as a space-filler to a pre-existing design. The two-dog arrangement is more compact and intense and Cupid is satisfactorily integrated, whereas in the three-dog type he always seems *de trop*. Finally, the tension of Adonis’ ineffectual departure is better suited to the more horizontal proportions of the two-dog canvases, while in the near square of the Prado painting – a format no doubt imposed by Philip II – his movement is not emphatic. It is noteworthy that in the most dramatic

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**Fig. 1** After Titian (?), *A Boy with a Bird*, probably sixteenth century. Canvas, 34.5 × 50.7 cm. Present whereabouts unknown (Lucerne, Private Collection, in 1932).

**Plate 3** Titian and/or workshop, *Venus and Adonis*, c. 1560. Canvas, 106.8 × 136 cm. Washington, DC, National Gallery of Art, Widener Collection (1942.9.84).

**Plate 4** Titian, *Venus and Adonis*, 1554. Canvas, 186 × 207 cm. Madrid, Museo Nacional del Prado (422).

**Fig. 2** Sir Robert Strange after Titian, *Venus and Adonis*, 1769. Engraving.
versions of the Prado type, those in the Getty Museum and in the de Charmant collection, horizontality is reasserted.

The evidence is inconclusive, but it may be that Titian painted a lost two-dog version once in the Farnese collection either when he was in Rome working for the family in the mid-1540s, or shortly after, on his return to Venice. If this is so, then the first two mythologies sent by Titian to Philip were enlarged versions of subjects already painted for the Farnese.7 However, since Vasari does not specifically refer to a Venus and Adonis executed by Titian for the Farnese, and since there is no record of its existence before 1648, when it is mentioned by Ridolfi, it remains controversial whether this painting was a Farnese commission or merely a later acquisition by the family. But it is worth making two observations. The recorded height of the Farnese Venus and Adonis, 123 cm, is identical with that of the Danaë painted for Cardinal Alessandro Farnese, and the two could have hung in line: this would be surprising for a chance coincidence. Furthermore, if the ex-Farnese painting could be proved to have been acquired on the market only in the seventeenth century, there would be no evidence other than stylistic for its date of execution. However, since it was lost to sight around 1800, and is certainly recorded only in Sir Robert Strange’s engraving of 1769 (fig. 2), the visual evidence is manifestly inadequate for developed analysis. So, while I think it likely that the ex-Farnese version – whether or not it was painted for the family – was indeed of the 1540s, such a view is obviously subjective.8

Even if one could firmly date the lost Farnese Venus and Adonis to the mid-1540s, it would still be considerably later than the Boy, which I would date to about 1520. So what was the Boy extracted from? One answer lies in a miniature of 1631 by Peter Oliver, which, although not unknown, has been insufficiently studied (plate 5).9 Signed, dated and inscribed Titianus Inven., the miniature was painted for Charles I and is still in its original frame. Abraham van der Doort’s 1639 inventory tells us that the painting that Oliver copied was then owned by the Earl of Arundel.10 In conception, the ex-Arundel Venus and Adonis fits precisely the mid-1520s. The arrangement of the dogs comes close to that of the cheetahs in Titian’s Bacchus and Ariadne (NG 35), as Miguel Falomir pointed out to me, and the figures’ movements are closer to the flowing rhythms of the Bacchanal of the Andrians than to the angular oppositions of the later versions of Venus and Adonis. Adonis’ right arm encircles Venus’ shoulder and his hunting spear is absent: Titian has not yet found the key motif of separation and the cause of Venus’ heartbreak.11 The colour combination of Adonis’ powder-blue robe and the rose-pink of the drapery on which Venus sits (an indeterminate garment, incidentally, not the velvet jacket of the later versions of Venus and Adonis) occurs in Titian’s work only in the draperies of the dancers on the left-hand side of the Bacchanal of the Andrians, whose date is disputed but which must fall between 1520 and 1529 (plate 6).12 Form and colour thus combine to support a date for the painting that Oliver copied to the decade 1520–30 and we may conclude that his miniature records Titian’s earliest known depiction of Adonis relinquishing Venus for the pleasures and dangers of the hunt. Given the overt referencing of the lost marble relief of the Bed of

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PLATE 5 Peter Oliver after Titian, Venus and Adonis, 1631. Parchment, 18 × 21.5 cm. Stamford, Burghley House.

Polyklitos in Venus’ pose, it may be that Titian’s original was painted for Alfonso d’Este, who was fascinated with that sculpture.\textsuperscript{13}

In the Arundel Collection the \textit{Venus and Adonis} was paired with a \textit{Mars and Venus}.\textsuperscript{14} With virtual certainty both had arrived together in the Habsburg Collection in Vienna by the 1720s.\textsuperscript{15} They were the same size.\textsuperscript{16} The \textit{Mars and Venus} is still in the Kunsthistorisches Museum, but the \textit{Venus and Adonis} was destroyed in 1945 and is known only from old photographs (fig. 3). It contains no Cupid, but his absence is explained by a passage in Crowe and Cavalcaselle:

‘In questa tela manca presentemente Amore colla colomba, per essere stato tagliato un pezzo del quadro, e in quel luogo, sostituita un pezzo di tela nuova e poi dipinta. Il quadro ... e in molte parte ridipinto, oltre ad essere stato mutilato anco ai lati. Vedesi però in mezzo a tanto rovina ancora qualche cosa che ricorda la maniera dello Schiavone, e potrebbe essere benissimo un lavoro di questo scolaro di Tiziano.’\textsuperscript{1} [In this picture Cupid with the dove is now missing, because a piece of the canvas has been cut away and substituted by a new piece of canvas, which was then painted. The picture is repainted in many areas as well as being mutilated also at the sides. Nevertheless, in the midst of such a ruin can be seen still features that recall the manner of Schiavone, and the picture might very well be by this follower of Titian.\textsuperscript{17}]

From reproductions of the ex-Arundel/Vienna \textit{Venus and Adonis} – and from Crowe and Cavalcaselle’s unenthusiastic account – it seems to have been dull. None of the Vienna catalogues claims it for Titian. Of course, it would have been fresher when copied by Oliver, in 1631, and before Cupid was excised and the canvas overpainted, but it is doubtful whether it ever possessed the vitality of an autograph work. It was probably a studio copy of a lost autograph painting, executed shortly after the original. Titian and his studio made many versions of many paintings over many years and it could in principle be argued that the ex-Arundel picture was a later version of a painting made in the 1520s, but against this is the fact that when Titian and his studio replicated earlier compositions more than a decade or so later, colour combinations and handling conformed not to the prototypes but to the characteristics of Titian’s current style. In short, whether or not Titian himself was involved to any degree with the execution of the ex-Arundel \textit{Venus and Adonis}, if it came from his studio it cannot be dated much after 1530.\textsuperscript{18}

Whatever the precise executive status of the Vienna picture, what is crucial is that this painting – as we know it from photographs – and Peter Oliver’s miniature taken together record the size, the complement of figures and the colours of a two-dog version of \textit{Venus and Adonis} painted by Titian in the mid-1520s. We may conclude therefore that: 1) Titian’s interest in the subject of \textit{Venus and Adonis} preceded by some thirty years the canvas sent to Philip II. 2) His fascination with Ovidian mythologies did not go underground between 1510 and 1545 but continued at least into the 1520s. 3) By the 1520s or 1530s Titian and/or his studio were producing same-size extracts, modified or not, of existing paintings.\textsuperscript{19} 4) By the 1520s or 1530s, Titian was producing more or less pure landscapes such as the \textit{Landscape with a Milkmaid}, an aspect of his work that modern scholarship has tended to discount. 5) Painting and wood-cutting were more closely allied in Titian’s work than generally thought.\textsuperscript{20}

These gains may well be sufficient, but I should like to venture a little further. To my eye, the \textit{Boy} finds its closest referents in Titian’s work of the late 1510s and early 1520s. There are immediate links of colour and form with the \textit{Worship of Venus} (Madrid, Prado) of 1518–20; the boy’s slightly prognathous features – expressive of disquiet, he is not one of Titian’s more attractive infants – can also be found in the angel performing the intimidating task of supporting the Virgin in the \textit{Assunta}, finished in 1518; the white sleeve is similar in handling to, although less vital than, that of Chloe in \textit{The Three Ages of Man} (Daphnis and Chloe, Sutherland Collection, on loan to the National Gallery of Scotland, Edinburgh) of 1516 (plate 7), and the definition of the putto’s wrist in a line of deep pink – a trick, as far as I know, that does not recur later – is found in one of the sleeping children in the same picture (see plates 25 and 26).\textsuperscript{21} In short, I
would prefer to date the Boy shortly before rather than shortly after the first version of Venus and Adonis, whose colouring suggests a slightly more advanced moment. If I am correct, this opens another avenue.

According to Marcantonio Michiel, writing in 1525 of a painting then owned by Girolamo Marcello, Titian had added a landscape and a Cupid to a sleeping Venus by Giorgione. Since Morelli this has nearly unanimously been identified with the so-called Sleeping Venus in Dresden. But the provenance of that picture from the Marcello collection is very far from secure; the many variants of the sleeping nude in that pose, including the Venus of Urbino, are all traditionally associated with Titian and only with Titian: X-rays of the Dresden painting show features entirely characteristic of Titian, and there are no signs of two hands at work on the surface.

Therefore, as first argued by Louis Hourtique, the Dresden painting cannot be that described by Michiel. What then did Marcello’s ‘composite’ look like? We cannot be sure how Giorgione’s nude was posed, but reclining nudes in the period are not few and my best guess is that she resembled Girolamo da Treviso’s well-known Sleeping Nude Woman in the Galleria Borghese. What did Titian’s Cupid look like? Describing in 1648 the painting then still in the Marcello collection, Ridolfi wrote: ‘...e à piedi è Cupido con Augellino in mano’ [‘and at her feet is Cupid with a small bird in his hand’]. The Cupid beneath the surface of the Dresden painting is so damaged that we cannot determine what he held, but a repetition of this full-length seated Cupid, excised from a reclining nude executed in Titian’s studio (Vienna, Akademie), holds not a bird, but a bow and arrow. If, therefore, we trust Ridolfi’s description, it was not this type of Cupid that Titian added to Giorgione’s painting. But in the National Gallery’s Boy we do have a Cupid holding a bird that was seemingly designed by Titian in the second decade. Did Titian, in about 1516–18, add a Cupid of this type to Giorgione’s painting, subsequently isolate him in a small canvas, and further re-employ him in the Venus and Adonis? Might one infer that a subsidiary purpose of isolating this Cupid was to establish that he was Titian’s invention, separable from Giorgione’s nude? When Titian added Saint Barbara to Palma Vecchio’s Virgin and Child with Saints Barbara and John the Baptist in the Accademia – the only example presently known of Titian completing a painting left unfinished by another artist – he painted her in his own manner, with no attempt to conform to Palma’s style; furthermore, Titian repeated her verbatim from his slightly earlier Virgin and Child with Saint Barbara and

The technical evidence
It is easy to understand why the Boy with a Bird attracted little interest in the twentieth century for it had accumulated one of the thickest and darkest old varnishes to remain on a painting in the National Gallery. A surface cleaning and varnishing is recorded in 1888, but since the treatment did not involve varnish removal this varnishing was an additional coating applied over the varnish layers from the previous restoration, which must have taken place before 1876 when the little canvas came into the collection. On acquisition it was noted to be in good condition. In 1993 it was again surface cleaned and more varnish applied in order to make the image sufficiently visible for an initial technical examination, including sampling: it was recognised that the present image was painted over another, but at the time the interpretation of the paint samples was very much coloured by the belief that the painting was likely to be a pastiche of the seventeenth century, or possibly even later.

When the possibility was proposed by Paul Joannides that the canvas might be more closely associated with Titian than had previously been suspected, removal of the discoloured varnish became essential in order to allow a proper assessment of technique and attribution. In spite of their thickness, the varnish layers are concerned, but with many small losses along the edges and junctions of the cracks (see Plate 12).
These probably occurred as a result of repeated relining of the original canvas – the lining present before the recent treatment almost certainly dated from the nineteenth century and is unlikely to have been the first lining. Some of the pentimenti – and parts of the first image – had become disturbingly visible, but the only losses of any appreciable size are those in the boy’s head and in the bush behind him. In retouching the painting the aim was to eliminate the interference to the legibility of the final design caused by the many small losses and also to reduce the more intrusive elements of the underlying composition, but without completely obscuring them (Plate 8).

Plate 8 Titian or Titian workshop (?), A Boy with a Bird. After cleaning and restoration.

A Boy with a Bird is painted on a piece of medium-fine tabby-weave canvas. As will be demonstrated, this was originally somewhat larger, but the existence of another version (Fig. 1) of the same format and similar dimensions (perhaps trimmed at the lower edge), which generally accords with the final state of the National Gallery canvas and therefore likely to have been painted after it, means that there is no reason to believe that the dimensions of this design have changed. The remnants of holes in the fragment of original canvas along the lower edge, previously folded around the stretcher but recovered following the recent relining, may represent the original tacking holes for the painting with its final dimensions. It is possible that the nails used to stretch the canvas in this state were hammered into the front face of the support, as generally seems to have been the case when stretching canvases in the fifteenth and earlier part of the sixteenth centuries. By the seventeenth century the more common procedure was to insert tacks into the sides of the strainers or stretchers. Another practice particularly associated with early canvas paintings is the use of solid wooden panels as supports over which the canvas was stretched. Evidence that this is likely to have been the case with A Boy with a Bird is supplied by a number of small regular round holes in the paint film and canvas, almost certainly exit holes of woodworm. Since these occur in central areas of the painting that would not have had stretcher members behind them, it can be concluded that the canvas was once attached to a panel that became infested by woodworm. In connection with A Boy with a Bird, however, it should be pointed out that the attachment of canvases to wooden supports continued into the seventeenth century, partly perhaps as a method of reinforcing and conserving paintings before the development of the technique of lining.

The weave and character of the canvas itself appear consistent with other canvases in paintings associated with Titian and his workshop in the first half of the sixteenth century. It is relatively tightly woven, with the occasional more thickly spun length of linen thread resulting in slight irregularities and raised threads. The thread count of warp and weft threads is a little coarser than those of most of the earlier canvases by Titian in the National Gallery, but finer...
than that for Portrait of a Lady (‘La Schiavona’; NG 5385). As a general rule, canvases chosen by Venetian painters tended to become coarser as the century progressed, but finer textiles continued to be woven and were available to painters in the seventeenth century as well, and so such a canvas could still have been obtained by a seventeenth-century pasticheur of Titian.

The canvas for A Boy with a Bird was prepared for painting with a warm red-brown ground (plate 9) applied directly to the canvas without any underlying layer of gesso—confirmed by the inclusion in some cross sections of canvas fibres immediately below the ground layer. The exposure of raised canvas threads in areas of damage on paintings by Titian has led in the past to claims that he often painted on red-brown grounds, but now that a relatively large number of works has been sampled and examined in cross-section it has become apparent that he nearly always prepared his canvases with a thin layer of gesso, often painting directly on the gesso but sometimes, and particularly in earlier works, priming it with a layer of lead white which could be tinted with black to make a pale grey painting surface. The presence on A Boy with a Bird of a red-brown ground of the type and colour particularly associated with seventeenth-century techniques would be an obstacle to a closer association with Titian were it not for the fact that his Venus Anadyomene in Edinburgh (plate 10), an unquestioned work, also has a red-brown ground, and without any gesso layer (plate 11). This ground consists mainly of red earth pigment, with a small amount of lead white and finely ground black. A few small dispersed bright orange-red particles also appear to contain lead; these are probably red lead. The ground on A Boy with a Bird is probably darker in colour since it contains a larger amount of black pigment, in this instance manganese dioxide, mixed with the red and yellow earths. The manganese dioxide is of the natural mineral form, which at the National Gallery has been found in a grey underpaint

A Boy with a Bird in the National Gallery: Two Responses to a Titian Question

**Fig. 5** A Boy with a Bird. Digital infrared reflectogram.

**Fig. 6** Attributed to Niccolò Boldrini, after Titian, *Landscape with a Milkmaid*, c. 1525–30. Woodcut, 37.5 × 52.5 cm. Fine Arts Museums of San Francisco, California. Achenbach Foundation for Graphic Arts (1963.30.1212).
on Titian’s Virgin and Child with Saint John the Baptist and a Female Saint (NG 635), usually dated to the early 1530s, and also on works by other North Italian painters, and especially the Brescians Moretto and Moroni, who used it in their grounds, some of which are strikingly similar in composition to that of A Boy with a Bird. These examples date from the 1530s and 40s or even later, but Moretto was already painting on brown grounds by 1526, the date of his Portrait of a Gentleman (NG 1025), and, perhaps more significantly for Titian, Correggio seems to have regularly employed brown preparations, even on some of his earliest works. It is tempting to suggest that when Titian began increasingly to work for the Mantuan court in the 1520s he came into contact with Correggio, and that admiring his female nudes with their pale opalescent flesh obtained by scumbling flesh tints over a warm dark preparation, he experimented with the technique for his Venus. Although this could account for the colour of the ground on A Boy with a Bird as a putative painting of the 1520s, it should not be forgotten that brown grounds of similar composition, including some with manganese black, occur widely in seventeenth-century painting.

The next layer that features in all the paint samples where the full layer structure is included is less easily explained: it consists of the bright yellow arsenic trisulphide mineral, orpiment, the particles easily recognised in the cross-sections because of their characteristic sparkling splinter shapes (especially clear in plate 9 and 15). Interspersed with the orpiment are colourless translucent particles of silica, a material that has also recently been reported in areas of red paint on a painting by Lorenzo Lotto of the early 1520s in the National Gallery of Art, Washington. Although the orpiment is applied in a layer of variable thickness and in some samples a little black pigment is present (and could be seen with the stereo-binocular microscope in a few areas of damage – see plate 20), it does not seem to have been modelled in any obvious way. It appears to function as a golden yellow imprimatura for the first abandoned painting, even though orpiment, a pigment that is notoriously difficult to handle and one that does not dry particularly well in oil, seems a strange choice for a preparatory layer. Another possibility is that the piece of canvas, already primed with brown and painted in this area with orpiment, was cut from a much larger picture and re-stretched. If so, the re-stretching must have happened very soon after this larger canvas was primed and painted, while the layers were still soft and flexible, since the stretching distortions now visible around the edges are clearly associated with the discarded pastoral scene.
This rules out the possibility that canvas cut from an older painting was used as the basis for a pastiche in the seventeenth century or later.

The relationship between the first composition as revealed by X-radiography and digital infrared reflectography (figs 4 and 5) and the woodcut made after a Titian design and attributed to Niccolò Boldrini (fig. 6) is also puzzling. The fact that the dimensions of the woodcut and those of the canvas in its final state are almost identical is a coincidence, since the hidden painting was originally larger. Moreover, the painted figures are not on the same scale as those in the woodcut or in the same relationship with one another. The part of the first painting most clearly visible in both X-ray and infrared images is the cow and milkmaid, which correspond closely, but not exactly, with the print. The head of the cow is cut and so it can be assumed that originally the canvas extended another four or so centimetres to the right. The infrared reflectogram gives an indication of the anatomical accuracy and detail with which the animal was painted; the loose skin of the neck, the curving horns and the swishing tail are all carefully rendered and indeed the outline of the hindquarters is perhaps more convincing than in the print where the slope has become somewhat exaggerated. In a sample taken from a point that coincides with the cow (plate 13) two pinkish-beige layers, containing lead white and red earth and then lead white, red and yellow earth and black, overlie the orpiment layer; the cow, therefore, was a light chestnut colour, rather like the cattle that appear in the background of Titian’s Virgin and Child with Saint John the Baptist and a Female Saint. The milkmaid – cut at the lower edge – also appears complete in every detail; the clarity of the image in the X-radiograph indicates that the folds of her costume were painted with a direct technique as opposed to one based on superimposition of glazes. A cross-section from the area of her skirt shows a layer of a dark reddish brown containing earth pigments with lead white, black and possibly some red lake (plate 14). Over this is a paler combination of similar pigments (also present in another sample) which may represent the highlight of a fold. If the figure originally knelt with her skirt and foot at the lower edge of the composition as in the print, then the canvas must have lost about the same amount as at the right edge (fig. 7).

Of the other figure group linked with the print only the lower parts can easily be distinguished in the X-ray and infrared images. The legs of the youth carrying the container are visible even on the surface of the final painting, and his arms, hands and the container can all be made out. His head and shoulders are largely obscured by the thicker paint of the child and bird in the final painting. Nevertheless, a shadowy area at the side of the child’s right temple in the infrared reflectogram indicates that the youth’s head was almost certainly in the same position as in the woodcut. A similar dark area in the child’s forearm is probably from the head of the foremost goat in the print and the body and front legs of the goat are perfectly clear. Its hind legs, however, appear to collide with those of the cow. Moreover, if the parts lost by the cutting of the canvas are completed as in the print, it can be seen that the young man and the goat were brought forward in the painting and that the goat would have to have been standing in front of the cow (fig. 7). Despite the goat being painted with a
pigment mixture containing enough black for the body and front legs to register clearly in infrared, there is no evidence for the paint of its hind quarters going over the hocks of the cow, which remain uninterrupted in the infrared image.\footnote{48}

Perhaps the realisation that a simplified and compressed variant of the woodcut design was not going to work explains why the first image was covered over. An alternative explanation could be that it was never intended as a proper painting and that the piece of canvas was simply being used to try out motifs in the woodcut, in which case it could even be argued that the painting preceded the print.\footnote{49}

Although it is impossible to be certain from the technology available, the general impression is that the painting was incomplete. The only other elements from the print that can be identified with confidence are the tree trunk and saplings on the right which show in infrared and on the painting surface. The marks and shapes made with an X-ray opaque material that appear towards the upper right corner in the X-radiograph suggest the rocks and buildings in this area of the print, but again the design would have to

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\footnote{48} A Boy with a Bird in the National Gallery: Two Responses to a Titian Question

\footnote{49} A Boy with a Bird. Digital infrared reflectogram detail.

\footnote{9} A Boy with a Bird. Digital infrared reflectogram detail.

\footnote{10} Titian, *The Holy Family with a Shepherd* (NG 4), c.1510. Canvas, 99.1 × 139.1 cm. Infrared reflectogram detail of Joseph.
be greatly compressed. The identification of indigo as the blue pigment (not the same as that in the final painting, but a pigment that appears in both of Titian’s great altarpieces in the Church of the Frari in Venice\(^5\) in the area of blue exposed by flaking of the upper image in the region of the boy’s forehead (Plates 12 and 13) and also underneath the green foliage (see Plate 22) indicates that a patch of blue sky was laid in the left quadrant of the canvas, which appears to have been blended into a warm light grey towards the right side.\(^5\) The left and upper edges of the canvas were probably cut by the same amount as the other edges, since the distortions caused by stretching are very similar – indeed it is clear that the first two tacks must have been those hammered in at the centres of the left and right sides (fig. 8).

The painter of the second image probably did not bother to cut down and re-stretch the canvas until later and surprisingly he worked directly over the first design, without applying a cancellation layer. There are signs in some cross-sections that the sequences of layers taken to represent the two campaigns of painting are not always completely bonded to one another, which suggests that the lower painting was fully dry before painting recommenced. However, there is no evidence of any varnish or oiling-out layers or accumulations of dirt that might indicate that a considerable interval had passed before the present picture was painted. The superimposition of images makes the interpretation of the reflectogram particularly difficult, but it seems that the design of the new picture was sketched in very freely using a brush and a carbon-containing paint. The lines of underdrawing that seem to belong to the figure of the boy vary considerably in thickness and weight (the latter partly related to the behaviour in infrared of the overlying paint): they are dark and heavy around the top of his head and broad and bold in the indications for his wings, the back of his puffed sleeve (in an earlier position than in the final design) and in the short mark that appears to indicate the dimple in his elbow. Finer lines can also be distinguished, notably around his jaw line, higher than in the final painting since the whole head was originally tilted further back (fig. 9). The end of his nose can just be distinguished in the middle of the present nose, while the underdrawn mouth must coincide with the painted nostrils. The first eyes, approximately at the level of the present eyebrows, have broadly indicated brows and the irises have been filled in rather than outlined in order to emphasise the direction of his gaze. Solid irises have been noted on other underdrawings associated with Titian – most easily visible where drawn and painted features do not coincide (fig. 10) – and the variety of weights of line is also typical.

It could be argued that the alterations made during painting are characteristic as well. These are not the adjustments of a copyist trying to make a replica; rather they show the resolution of uncertainties as part of the process of developing the new design. Perhaps the most significant change, in that it may affect the subject matter of the painting, is the elimination of the wings, initially brushed in with a salmon-pink paint containing lead white and red earth (Plate 16) – had they been completed they would surely have received further layers containing the red lake of the boy’s costume. The bunched sleeves of his white chemise were originally higher; strongly brushmarked strokes of lead white cut into the area that is now occupied by his cheeks and the edge of his mouth, and this change must be associated with the shifting downwards of the whole face. The X-radiograph shows that the painting of the face in its underdrawn position had begun before it was moved, and indeed the eyes that register in the X-ray image are those from the first attempt.\(^5\)\(^2\) Other alterations are to the pigeon; originally its wings were attached further down its body – a connection that is still not convincingly resolved – and its head was slightly further to the left. This adjustment may be connected with the search for the right position of the hands. Although it does not register in the X-radiograph, an area of pink paint partly covered by the underside of the bird’s left wing looks very like a rough approximation of a thumb in infrared. The painter may have considered positioning the whole hand higher, with
the forefinger under the beak instead of the thumb. This would explain why the left side of the thumb was reduced, making a wide enough gap to separate it from the new forefinger.

The flesh tints of the boy are striking for their vivid pink colour, and especially in the area of the hands. Examination with a stereo-binocular microscope shows that the paler tones contain lead white, with red lake as the principal red, together with some vermilion, and also the occasional particle of malachite (plate 17). The addition of green pigments, usually malachite or green earth, to give a cooler cast to areas of flesh paint has been observed on other works by Venetian painters of the early sixteenth century, including Titian. Where the flesh tones are darker there is more vermilion in the mixture, and also black and red earth pigments. On the child’s near cheek the paler mixture is scumbled over a warmer darker red containing red earth and vermilion. The strokes that define the creases of his plump wrists contain mainly vermilion and red lake (plate 17). There appears to have been little, if any, fading of the red lake that forms such an important component of these flesh mixtures, which explains why they appear unusually intense.

The pink costume was also painted with red lake and white, with some vermilion. Under magnification enormous lumps of a rich lake pigment can be seen (plate 18), but the colour of the paint surface now appears somewhat muted because the drapery, which has almost certainly become more translucent with time, was painted over the warm golden brown of the cow from the first composition. Immediately to the right of the boy’s face the colour appears dull because it covers the broad dark strokes across his shoulders that feature in the infrared reflectogram (probably part of the ‘underdrawing’). Only where the pink mixture goes over the white of the sleeve in the area of the

**Plate 17** *A Boy with a Bird*. Digital macrophotograph of the short upper crease in the boy’s wrist.

**Plate 18** *A Boy with a Bird*. Digital macrophotograph of the edge of pink drapery where it begins to puff up on the right.

**Plate 19** *A Boy with a Bird*. Digital macrophotograph showing the broken brushstrokes of the sleeve over the light brown paint of the cow from the first painting.

**Plate 20** *A Boy with a Bird*. Digital macrophotograph of the blue paint of the distant mountains. Particles of orpiment from the lower painting are visible in the cracks.
pentimento does it have the brilliance associated with areas of red lake in Venetian painting, including the many early works by Titian with draperies painted with glazes of red lake over white. On this small canvas, however, the pink is painted directly and rapidly without any real layering of glazes.

The colour of the cow is deliberately exploited in the painting of the fine linen of the child’s sleeve where it is allowed to show through the gaps in the warm grey and white paint dragged over it (PLATE 19). The broken line of white that marks the front edge of the sleeve is a classic Titian brushstroke, yet can easily be imitated. The incorporation of elements of an underlying and completely different composition into the final work, however, is more remarkable, and Titian was most famously to do this with the red velvet drapery in his Venus with a Mirror in the National Gallery of Art, Washington.55 The cow also serves as a base for the green wooded slope in the middle distance, showing through the many gaps in the swirls of rapid brushwork, and in the foreground the paint layers applied over the youth, goat and milkmaid are so insubstantial that it seems that the figures were intended to be partly visible, giving structure to the slope of the bank or mound on which the child leans. The final glazes of warm brown – perhaps one of the pitch browns found on several Venetian paintings of the early sixteenth century at the National Gallery56 – and red lake, for instance the red streak to the right of the legs of the youth with the goat, are all applied with horizontal strokes; the glazing stops short of the present lower edge, further confirmation that this design was never any larger.

The warm overall tonality of the painting can be attributed largely to the pervasive use of red lake; it appears in mixtures together with red earth in the pinkish greys of the pigeon, in the orange-pink cloud behind the trees at the top edge, in the light brown paint dragged over the indigo blue sky (taken to be that of the first painting) at the left edge, and even with the blue of the distant mountains on the right (PLATE 20). The blue pigment used for this landscape and sky is azurite, ground to an exceptionally small and consistent particle size (PLATE 21).57 Although azurite of this fineness and homogeneity has not been observed on a Venetian painting in the National Gallery, a similar azurite has been reported as the pigment on the turquoise-blue sleeve – very close in colour to the sky in A Boy with a Bird – of one of the shepherds in Giorgione’s Adoration of the Shepherds in Washington.58 In the puffy white clouds, painted wet-in-wet into the sky, a few scattered particles of lapis lazuli can be seen under magnification.

The infrared reflectogram shows how the basic arrangement of the background foliage was dashed in with decisive zigzags of paint and the foliage then painted in with broad strokes and dabs of dark green. Although some darkening has almost certainly occurred, the leaves can never have been very bright, since verdigris, the standard green pigment in sixteenth-century Venetian painting, is only one of several pigments found in the samples; they also include black, red and yellow earths (in the lowest layer for the foliage in the sample (PLATE 22)), green earth mixed with a copper carbonate (probably the...
same azurite as in the sky), and a yellow earth as an intermediate layer, then finally verdigris, its cold blue-green hue modified by the addition of a yellow lake (plate 22).59 Similarly complex mixtures for green foliage have been observed in paint samples and in surface examination with a microscope of early paintings by Titian,60 and the detailed analysis of a sample from a late work, *The Death of Actaeon* (NG 6420), has revealed an almost identical combination of pigments.61

The pigments found in *A Boy with a Bird* are therefore consistent with products of the Titian workshop. The choice of linseed as the principal painting oil, identified in samples from both the final work and the underlying design,62 is also characteristic; a high proportion of paint samples from Titian’s works analysed by GC–MS has been found to contain linseed oil rather than the walnut oil favoured by many of his contemporaries.63 All of these materials continued to be used in the seventeenth century, yet it is difficult to believe that a painter of that time, setting out to create a work in the manner of Titian in the 1520s or 30s could have had such a detailed knowledge of how they were used in his workshop, a knowledge that has only been rediscovered with the development of modern methods of scientific investigation. Moreover, the development of the picture
seems too complicated for a later pastiche. Even if it could be argued that an imitator of Titian began with the idea of making a painting based on a Titian print, and on abandoning it decided to develop a new design by extracting a detail from a larger composition, the number of changes to the final image and especially the way in which that image was sketched in with such boldness over the still visible first painting suggest a knowledge of Titian’s working habits beyond that of any known seventeenth-century copyist or imitator of Titian and Giorgione.64

Of Titian’s paintings from 1520, the Venus Anadyomene, a work variously dated by scholars across the span of the decade, but perhaps best dated to about 1525, is the one that seems closest in technique to the Boy with a Bird, not only in details such as the colour of the ground and the pigment mixtures used for flesh tints, but also in the handling of the paint. In
both there are passages that are crisp and precise (hard, even, in the case of the hair of the boy in the London canvas, see plate 23) together with others that are vague and undefined. In the Venus isolated features, such as cheeks, elbows and knuckles are strongly flushed with pink (see plate 24), but the marked contrast with the cool tints of the rest of the flesh painting suggests that there is likely to have been overall fading of the red lake component. The ‘dry’ texture of the flesh painting, almost like smudged pastel, but actually the result of fairly extensive use of a direct wet-in-wet application, means that Venus’ limbs are fully and softly rounded, as is the chubby arm of the boy. This is in marked contrast to the painting of the infants in The Three Ages of Man (see plates 7 and 26), which, in spite of certain similarities with the Boy with a Bird (including the awkward handling of the junction between arm and shoulder of the girl, also conveniently masked by drapery, see plate 25), is very different in technique. Here their features and the outlines and creases of the folds of their skin (only occasionally tinged with red) are all painted with the point of the brush and a medium-thick paint, including one close in date to the Prado painting but executed largely by assistants, also in the National Gallery.  


Peter Dreyer noted a representation of one in the section added to Watteau’s Enseigne de Gersaint (see Wethey, cited in note 1, p. 230).

The check of the Boy was carried out with Giorgia Mancini for whose comments I am most grateful; she also took the initiative of searching out an X-ray image.

Several versions of the three-dog type, all differing slightly from one another, were executed by Titian and his studio over the following decade, including one close in date to the Prado painting but executed largely by assistants, also in the National Gallery.

See P. Joannides, ‘Titian in London and Madrid’, in His Talents and Currents (cited in note 6), pp 19-24, for the argument that the Damae sent to Philip II is the once square ex-Wellington version, not that in the Prado.

8 Painted records of the ex-Farnese painting perhaps survive in canvases in the Ilchester Collection (H. Wethey, Titian, The Mythological and Historical Paintings, London 1975, p. 153, 114 × 140 cm – close to the Farnese version, 123 × 150 cm) and one in a Belgian private collection (probably 122 × 147 cm; the dimensions were confused by Wethey, ibid. p. 194, who evidently inverted height and width and probably took inches for centimetres), but these, while identical with each other, differ from Strange’s engraving in that neither has vegetation at the right-hand side. I suspect that the vegetation is Strange’s invention, but it cannot be ruled out that the Ilchester and Belgian canvases derive from a different, if similar, original, also now lost.

Wethey 1975 (cited in note 8), p. 194. The miniature was prepared in a drawing, pen and ink with grey wash over black lead, 19.2 × 22.3 cm, in the Yale Centre for British Art (B/575.4.1532), which is signed and dated 1651 at the upper right, and inscribed below Titiana inv. (see L. Stanton and C. White, Drawing in England from Hilliard to Hogarth, exh. cat., The British Museum, London 1985, no. 37).

10 Millar 1960 (cited in note 2), p. 104, no. 6 (Windsor Ms.). ‘Item done upon the lighte the sixt beeing the Picture of Adonis Venas Cupid and some doegys by [them] done after Titian wch said limit piece is dated 1651, whereof the Principall in oyle Gullors belongeth to my Lo: of Arrundell.’ A marginal annotation remarks ‘don by Peter Olliver after Titian wch your Mate with your owne hands delived it to my lord Chamblenes dravf’. This is a summary of an annotation in vaguely phonetic English which indicates that Oliver’s miniature was itself copied ‘to pis auff ardonis Was te noffember 1659 bi lui delisuet du kungs hands inde kabinet and bij his M agen diifffert to dik meler chanelurs derv fer to kopto and den to ristorit aing vorda kungs us tu de kabnt’ with a marginal note ‘hir Was bij ind presenz de dik auff leonsen transfors and M istadi innunt’. Oliver’s copy was also mentioned in the Victoria and Albert Museum’s Ms ibid. p. 214, no. 5; ‘A pece Venus and Adonis with some doggy by them after Titian. By Peter Oliver’. I am most grateful to Joan Culverhouse for help with my study of the Bingley miniature.


12 As other copies by Oliver of surviving paintings by Titian demonstrate, his rendering of colour is very accurate.

Notes
1 C. Gould, National Gallery Catalogues. The Sixteenth-Century Italian Schools, London, 1975, pp 298-9. This article is a by-product of a study of the versions of Titian’s Venus and Adonis on which I am collaborating with Jane Turner and Alec Cobbe: to both my profound thanks. In the National Gallery Jill Dunkerton, Giorgia Mancini and Carol Plazzotta were unfailingly helpful and I remember with great warmth the consistent kindness of Jill Dunkerton, Giorgia Mancini and Carol Plazzotta were unfailingly helpful and I remember with great warmth the consistent kindness of Jill Dunkerton, Giorgia Mancini and Carol Plazzotta were unfailingly helpful and I remember with great warmth the consistent kindness of Jill Dunkerton, Giorgia Mancini and Carol Plazzotta were unfailingly helpful and I remember with great warmth the consistent kindness of Jill Dunkerton, Giorgia Mancini and Carol Plazzotta were unfailingly helpful and I remember with great warmth the consistent kindness of Jill Dunkerton, Giorgia Mancini and Carol Plazzotta were unfailingly helpful and I remember with great warmth the consistent kindness of Jill Dunkerton, Giorgia Mancini and Carol Plazzotta were unfailingly helpful and I remember with great warmth the consistent kindness of Jill Dunkerton, Giorgia Mancini and Carol Plazzotta were unfailingly helpful and I remember with great warmth the consistent kindness of Jill Dunkerton, Giorgia Mancini and Carol Plazzotta were unfailingly helpful and I remember with great warmth the consistent kindness of Jill Dunkerton, Giorgia Mancini and Carol Plazzotta were unfailingly helpful and I remember with great warmth the consistent kindness of Jill Dunkerton, Giorgia Mancini and Carol Plazzotta were unfailingly helpful and I remember with great warmth the consistent kindness of Jill Dunkerton, Giorgia Mancini and Carol Plazzotta were unfailingly helpful and I remember with great warmth the consistent kindness of Jill Dunkerton, Giorgia Mancini and Carol Plazzotta were unfailingly helpful and I remember with great warmth the consistent kindness of Jill Dunkerton, Giorgia Mancini and Carol Plazzotta were unfailingly helpful and I remember with great warmth the consistent kindness of Jill Dunkerton, Giorgia Mancini and Carol Plazzotta were unfailingly helpful and I remember with great warmth the consistent kindness of Jill Dunkerton, Giorgia Mancini and Carol Plazzotta were unfailingly helpful and I remember with great warmth the consistent kindness of Jill Dunkerton, Giorgia Mancini and Carol Plazzotta were unfailingly helpful and I remember with great warmth the consistent kindness of Jill Dunkerton, Giorgia Mancini and Carol Plazzotta were unfailingly helpful and I remember with great warmth the consistent kindn...
Titian’s employment of this relief representing Romano and others (see N. Dacos, Hebe in the Farnesina source) refers to a suggested that the Vienna overlooked the passage in Crowe and Cavalcaselle that accounted for it. The relief, whose first provenance of the pair completely but usefully noted that they had been in the Belvedere since 1730, has not been in Allerhöchsten Befehl im Jahre 381, Vienna. About the passage in Crowe and Cavalcaselle that accounted for it, the relief’s sleeping Cupid, the same detail studied by Michelangelo on the verso of Titian’s study for the Martyrdom of Saint Lawrence – is a sketch of a small saleable painting – an amputee imitating an extraction... This is paralleled by a canvas in the Académie in Vienna, mentioned below. I have treated this issue in ‘Titian and the Extract’, Studi Tizianeschi, IV, 2006, pp.135-48.

For further discussion on this matter see my ‘Titian’s Repetitions’, forthcoming in a much-delayed collection of essays. Presumably Cupid was excised from the ex-Arundel Venus and Adonis as a small saleable part of the original, and Michelangelo's contemporary drawings of female nudes, may also be connected. Michelangelo would in any case have needed no encouragement to plunder Michelangelo’s ideas. One might wonder whether it is no more than coincidence that on the verso of Titian’s study for the legs of an executioner in the Gesuiti – is a sketch of the Rebellious Slave – is a sketch of the relief’s sleeping Cupid, the same detail studied by Michelangelo on Windsor 12765. For this identification are in Sutherland (cited in note 21), p. 525, and the pose of the youth reveals knowledge of Raphael’s Dream of Raphael in the Bega, and the pose of the youth reveals knowledge of Raphael's San Lorenzo, Titian to 1518, New Haven and London 2001, pp. 193–200, with further references. Additional arguments for this identification are in Sutherland (cited in note 13), pp. 51–2.

13 Titian’s employment of this relief representing Psyche and Cupid (studied by D. Rosand, ‘Titian and the “Bed of Polykleitos”’, The Burlington Magazine, CXVII, April 1975, no. 862, pp. 241–3), some twenty years earlier than had previously been assumed, requires some comment. The relief, whose first recorded owner was Lorenzo Ghiliberti and which descended in his family, had acquired fame enough by 1517 to attract Alfonso d’Este, who asked Raphael to obtain it for him (J. Shearman, Raphael in Early Modern Sources, 2 vols, New Haven and London 2003, I, pp. 285–6). Raphael failed, but the effort may have quickened his interest in the relief, since the pose of Psyche was adopted in a marble relief in a stucco releve attributed to Antonio da Ferrara in the Farnesina, and the pose of Cupid is that of the sleeping Cupid in the Belvedere since the Vienna 382, Vienna. About the passage in Crowe and Cavalcaselle that accounted for it, the relief’s sleeping Cupid, the same detail studied by Michelangelo on the verso of Titian’s study for the Martyrdom of Saint Lawrence – is a sketch of a small saleable painting – an amputee imitating an extraction... This is paralleled by a canvas in the Académie in Vienna, mentioned below. I have treated this issue in ‘Titian and the Extract’, Studi Tizianeschi, IV, 2006, pp.135-48.

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14 Hervey, The Life of Thomas Howard, Earl of Arundel, Cambridge 1921, p. 498, no. 381, and Adonis and Venus. For the dispersal of the Arundel Collection, which continued into the 1720s, see J. Brown, Kings and Collectors, Collecting Art in Seventeenth-Century Europe, New Haven and London 1990, pp. 61–6.


A Boy with a Bird

20 It has not been remarked that in the Landscape with Milkmaid the flattening of the milkmaid’s drapery recalls the kneeling women in Raphael’s Fire in the Borgo, and the pose of the youth reveals knowledge of Raphael’s San Lorenzo, Titian to 1518, New Haven and London 2001, pp. 193–200, with further references. Additional arguments for this identification are in Sutherland (cited in note 13), pp. 51–2. For this material see Joannides (cited in note 23), L. Hourtique, ‘Le problème de Giorgione, sa légende, son oeuvre, ses élèves’, Paris, 1930, pp. 64–74.

As often noted Girolamo’s figure is similar in type to the sleeping nudes in Marcantonio’s so-called Dream of Raphael, which is probably based on a design by Giorgione.

21 For this material see Jourdaux (cited in note 21), p. 179–84.

22 The first set of samples was taken by Ashok Roy and investigated by Jilleen directed by Joannides (cited in note 23), 1933, I, p. 102. Gould 1975 (cited in note 1) drew attention to Ridolfi’s remark in connection with NG 933.

23 This material see Jourdaux (cited in note 21), pp. 179–84. For this material see Jourdaux (cited in note 21), pp. 179–84.

24 As often noted Girolamo’s figure is similar in type to the sleeping nudes in Marcantonio’s so-called Dream of Raphael, which is probably based on a design by Giorgione.


26 For this material see Jourdaux (cited in note 21), pp. 179–84. For this material see Jourdaux (cited in note 21), pp. 179–84.

27 The first set of samples was taken by Ashok Roy and investigated by Jilleen

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29 For further discussion on this matter see my ‘Titian’s Repetitions’, forthcoming in a much-delayed collection of essays. Presumably Cupid was excised from the ex-Arundel Venus and Adonis as a small saleable part of the original, and Michelangelo’s contemporar...
Veronese's small canvas painting *The Rape of Europa* (NG 57) is mounted on an oak panel, which has been shown by dendrochronological analysis to consist of planks from a tree felled in either 1618, or more probably the 1620s; see N. Henry, *National Gallery Catalogues: The Sixteenth Century Italian Paintings*, Vol. II, London 2008, forthcoming.

The closest match in the Collection occurs on a much damaged painting *A Coward* (NG 3), which, in common with *A Boy with aBird*, has been taken as a seventeenth-century imitation but is almost certainly a work painted towards the middle of the sixteenth century. For the thread counts of the early canvases used by Titian for his earlier works.


The samples, generously supplied by Lesley Stevenson of the Conservation Department at the National Galleries of Scotland, were analysed using EDX by Marika Spring.

Marika Spring's report on the analysis also records 'colourless particles, which are silicates associated with the earth pigment, as well as calcium carbonate, which may be associated with the red earth or may have been mixed with it. X-ray diffraction (which detects only major components) identified silica, calcium carbonate and iron oxides in this layer. EDX mapping confirmed that there are particles containing Ca only (ie calcium carbonate), Si only (ie silica) and iron oxides. There are also other silicates containing a combination of K, Al, Ca and a little Fe.'

The report cited in note 38 continues: 'The black pigment contains mainly manganese (sometimes in the form of large agglomerates) and so can be identified as manganese dioxide. Some barium sulphate is also present, a common accessory mineral with the manganese dioxide mineral pyrolusite. This differs from the mineral used by Titian and Annibale Carracci for *The Three Muses* (NG 2028) of about 1604 is very similar in weight and weave to the fine canvases used by Titian for his earlier works.

Although the flesh tints of figures of children, and sometimes also be earth pigment or impurities associated with natural azurite. Some yellow and red particles are also present; these may be seen that some of the particles are angular which would suggest that the design of the print could have been pieced together from more than one source. If the figures in the National Gallery canvas did precede the woodcut, they might be expected to be in reverse, as in the drawing showing the same design in the Louvre, the stance of which is disputed but which is considered by some scholars to have been made expressly as a guide for the woodcutter; see Rosand and Murano 1976 (cited in note 3), p. 101.

L. Lazzarini, *Il Colore nei Pittori Veneziani tuà l’1460 e il 1576*, *Bollettino di Arte*, Studi Veneziani, Ricordi del Museo del Vetro, Venezia 1983, pp. 135–44. Apart from the occurrences on Titian’s *Assumption of the Virgin of 1518* and the *Praet Altarpiece* of 1519–26, where in both cases the indigo appears mixed with lead white as a first lay-in for areas of blue (see p. 142 – the term *imprimatur* is here used in the sense of a local underpainting: the only other painting with indigo listed in Lazzarini’s extensive table is by Tintoretto.

The paint layer apparently from the first painting in a cross-section made from a sample taken from towards the left side of the present area of open sky contains some indigo mixed with lead white and red earth. If samples from further to the right the indigo might well have faded. In the samples from the *Laocoön* it is considered by some scholars to have been made expressly as a guide for the woodcutter: see Rosand and Murano 1976 (cited in note 3), p. 101.

Titian began to paint the heads of the Virgin and Child in *The Holy Family with a Shepherd* (NG 4) in their first underdrawn positions before deciding to change them, and here too the first sets of features tend to predominate in the X-radiographs.

For example, green earth occurs in the figure of Bacchus in *A Boy with a Bird* (NG 57) and in a sample of deeper pink from the figure of Venus in *Ariadne*, which is disputed but which is considered by some scholars to have been made expressly as a guide for the woodcutter; see Rosand and Murano 1976 (cited in note 3), p. 101.

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59 The green pigments, and their place in the layer structure, have been identified by EDX mapping in the SEM. In the second yellow-green layer in the sample illustrated the green earth is located by its potassium component, which appears together with well-defined particles containing copper (probably azurite, blue copper carbonate), yellow earth and particles containing calcium which are probably calcium carbonate and may be the substrate of a yellow lake, now faded. The layer above is a darker more translucent green and here the copper is dispersed through the layer. This may be verdigris. There seem to be Ca-containing particles in this layer also, so it probably contains calcium carbonate, perhaps in the form of yellow lake.


61 The sample, from the deep green foliage towards the right edge, was examined as a cross-section and analysed by EDX.

62 The samples were examined and analysed using FTIR microscopy and GC–MS by Catherine Higgitt. In two samples, from the pink paint of the boy’s finger and from his white sleeve, the P/S ratio indicates the possible presence of walnut oil. However, in the former sample beeswax was also found, as a contaminant from the wax filling material used in the nineteenth-century restoration, and this may have affected the results.

63 See Dunkerton and Spring 2003 (cited in note 30), p. 18 and note 35 (with further references).

64 To our knowledge no detailed technical studies have been undertaken on paintings by artists such as Padovanino and Pietro della Vecchia. Seventeenth-century copies and pastiches of Titian can usually be recognised as such because of differences in surface texture and craquelure, largely the result of different canvases, grounds and paint mixtures.