



# National Gallery Technical Bulletin

Volume 20, 1999

Painting in Antwerp  
and London:  
Rubens and Van Dyck

National Gallery Publications  
London

Distributed by  
Yale University Press

Series Editor: Ashok Roy

© National Gallery Publications Limited 1999

All rights reserved. No part of this publication may be transmitted in any form or by any means, electronic or mechanical, including photocopy, recording, or any information storage and retrieval system, without the prior permission in writing of the publisher.

First published in Great Britain in 1999  
by National Gallery Publications Limited  
St Vincent House, 30 Orange Street  
London WC2H 7HH

British Library Cataloguing in Publication Data  
A catalogue record for this journal is available  
from the British Library

ISBN 1 85709 251 1  
ISSN 0140 7430  
525278

Edited by Diana Davies and Jan Green  
Page make-up by John Gibbs  
Printed in Great Britain by BAS Printers Limited,  
Over Wallop, Hampshire

Front cover  
Anthony van Dyck, Detail of Lady Thimbelby from *Lady Elizabeth Thimbelby and Dorothy, Viscountess Andover*  
(see Plate 34, p. 74).

Page one  
Peter Paul Rubens, Detail from 'Peace and War'  
(see Plate 1, p. 90).

# The National Gallery Van Dycks: Technique and Development

ASHOK ROY

THE NATIONAL GALLERY'S holding of works by Anthony van Dyck is broad and substantial and represents virtually the whole of the artist's career and the variety of his production. In recent years five major paintings by him have been acquired: the double portrait of *Lady Elizabeth Thimbelby and Dorothy, Viscountess Andover* (NG 6437) bought for the Gallery in 1977, *Charity* (NG 6494) bought in 1984, with another acquisition made a year later, *The Balbi Children* (NG 6502), and the double portrait of the Stuart Brothers (NG 6518) acquired in 1988. Most recently, in 1997, the *Portrait of François Langlois* (NG 6567; Plate 1) was acquired jointly with the Barber Institute of Fine Arts in Birmingham. Details of these acquisitions may be found in the relevant National Gallery Reports. The works span Van Dyck's career from the early small-format portrait on panel of Cornelis van der Geest (NG 52), painted in Antwerp around 1620, to large and ambitious court portraits from England, painted in the late 1630s, including the monumental *Equestrian Portrait of Charles I* (NG 1172; 1637–8). Van Dyck's period in Italy (1621–7) is represented by two pictures: the *Portrait of George Gage with Two Attendants* (NG 49; probably 1622–3), likely to have been painted in Rome, and *The Balbi Children*, painted in Genoa in about 1625–7. There is also a work produced in Brussels: *The Abbé Scaglia adoring the Virgin and Child* (NG 4889; 1634–5) and, to represent Van Dyck's work as a designer of subjects for prints, there is an monochrome oil sketch on panel, *Carlo and Ubaldo see Rinaldo conquered by Love for Armida* (NG 877.2), also of about 1634–5.

The great majority of Van Dyck's paintings are in oil on canvas. The oil sketch on panel mentioned above is one exception; the other in the National Gallery Collection is a fairly large finished panel painting, as opposed to an oil sketch, of *Charity*, made in 1627–8 after Van Dyck's return to Antwerp from Italy. It is evident that a canvas painting technique suited Van Dyck's manner of working, both for portraits and for history pictures, since this

accorded most closely with the main works he had admired in Italy, particularly Venetian painting and, more specifically, the paintings of Titian, Veronese and Tintoretto. Working on canvas, as opposed to panel, in general allows greater speed of execution, the ready participation of studio assistants, and the production of paintings on a large scale at relatively lower cost. Furthermore, high-quality wood panels for painting are difficult to manufacture, particularly in larger sizes, requiring specialist carpentry skills as well as good supplies of high-quality timber. These were available in Antwerp, but perhaps less so in Italy and England during Van Dyck's periods there.<sup>1</sup> On panel, however, a higher degree of finish is possible, with smoother effects, and the rendering of refined detail becomes more attainable (Plates 2 and 3).<sup>2</sup> This explains the choice of panel for the oil sketch as a source for an engraving, where precision of representation is important. The use of panels for *modelli* to show clients is traditional, even if the finished work was to be on canvas, probably because the elements of design could best be emphasised in a small work on a support of wood. In *Charity*, which is painted on an oak panel, an unusually smooth paint surface was evidently sought to represent the vulnerable flesh of the naked children and to enhance the glossy, relatively high-key colour effects in the picture.

In most cases, other than in the works on panel, Van Dyck worked over a coloured ground of some sort, although in the paintings examined here, this seems rarely to have been very dark. Double grounds for canvas paintings are common at this period, and the upper ground was usually some shade of light brown, or light to mid-grey (Plates 4 and 5). Van Dyck seems to have been content to use the priming method in common currency in the country in which he was painting, and perhaps this indicates also the habitual use of ready-primed canvases from local sources of supply.

Other than a limited survey conducted in Washington in 1990,<sup>3</sup> little technical study has been





Plate 1 Anthony van Dyck, *Portrait of François Langlois* (NG 6567), 1630s? Canvas, 97.8 × 80 cm.



Plate 3 Van Dyck, *Charity* (NG 6494). Detail showing smoothly applied paint on a panel support.



Plate 2 Van Dyck, *Portrait of a Woman and Child* (NG 3011). Detail of the woman's dress showing the application of impasto in a canvas painting. Compare Plate 3.

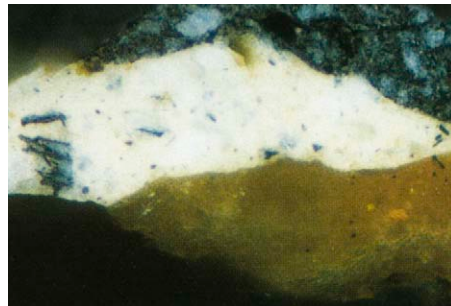


Plate 4 Van Dyck, *Portrait of a Woman and Child*. Cross-section from the dark grey paint of the woman's dress. The double ground consists of a lower layer, largely calcium carbonate in oil, with a little earth pigment, and an upper layer of cool, light grey composed of lead white and wood charcoal. Original magnification 400×; actual magnification 240×.

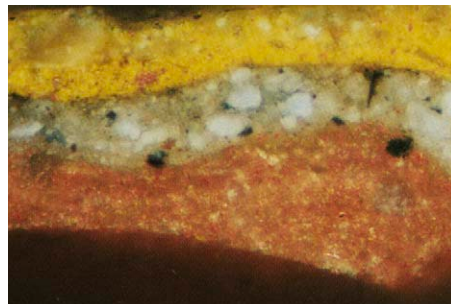
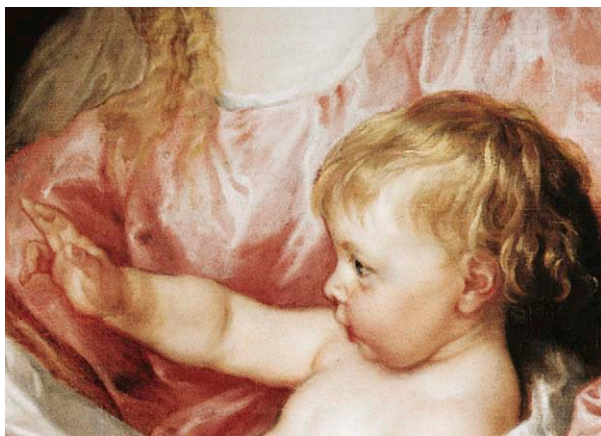


Plate 5 Van Dyck, *Lady Elizabeth Thimbelby and Dorothy, Viscountess Andover* (NG 6347). Cross-section from Lady Dorothy's gold satin dress. The double ground consists of a red-brown lower layer of earth pigment and calcium carbonate with a warm mid-grey-brown upper layer. Original magnification 400×; actual magnification 240×.





**Plate 6** Van Dyck, *The Abbé Scaglia adoring the Virgin and Child* (NG 4889). Detail showing outlining in tones of red and brown paint.

made on Van Dyck's paintings, although there is no reason to suspect that they would depart in any significant way in materials and methods of painting from standard practice of the period. As Jo Kirby has explained in her article above, that practice has been recorded to some extent by Theodore de Mayerne, but it is unclear whether his accounts, notes and commentaries are always accurate or well-understood. But there is no doubt that de Mayerne's record is a very valuable one generally for seventeenth-century painting technique, and particularly for the materials in use. The methods Van Dyck specifically employs can often be evaluated best by close examination of the paint surface: the free and frequently open brushwork allows underpaints to be glimpsed through dragged surface paints, underdrawing in fluid dark paint can sometimes be seen at the junctions of passages of paint where these do not quite meet and outlines are often reinforced (Plate 6). The range of pigments employed, judged through the stereomicroscope, is neither particularly elaborate nor unusual. The technical characteristics of the paintings can be ascertained by a combination of visual examination and photography, or imaging with X-rays and infra-red radiation. Any remaining questions can usually be answered by analysis of samples, and examination of layer structure by standard methods.<sup>4</sup>

Many of the National Gallery Van Dycks have been subject to a certain amount of technical scrutiny over the years, usually in connection with questions raised in advance of, or during, conservation treatment. This information has not been gathered in a highly systematic way, but there is sufficient technical material, and the pictures are sufficiently

diverse in subject matter and date, to justify a survey of Van Dyck's paintings. This survey, arranged chronologically, is presented below for all the paintings which have undergone at least some analysis. Further information on condition, subject matter, history and provenance is given in Gregory Martin's *Catalogue of the Flemish School*.<sup>5</sup>

### *Portrait of a Woman and Child*

Canvas, plain weave (tabby): 13 $\frac{1}{2}$  × 12 ↔ threads/cm;<sup>6</sup> 131.5 × 106 cm.

This double portrait (Plate 7) is thought to have been painted in 1620 or 1621, either in Antwerp just before Van Dyck's departure to Italy in 1621, or on his arrival in Genoa that year. It is just possible that the picture dates from a visit to London in 1620. The materials and technique of the picture seem more in accord with an Antwerp origin than one in Genoa, since Van Dyck's Genoese portraits appear generally to have single-layered light or mid-brown grounds.<sup>7</sup> The ground of the present painting consists of two layers: a semi-translucent lower layer, largely calcium carbonate, but containing also a little red and brown ochre bound in a drying oil, over which there is a warm mid-grey oil paint, mainly of lead white, with wood charcoal and some brownish ochre. Canvas grounds of this general type were standard in Antwerp and elsewhere in the Low Countries from the early seventeenth century, and are found in paintings by Rubens, Jordaens, Frans Snijders, David Teniers and others. In the *Woman and Child* this ground is substantially concealed by the overlying layers of paint, and it plays little role in the composition or the colour design of the picture, although it can just be seen through thin wash-like paint beneath the child's chin and cheek at the junction with the small lace ruff, at the woman's temple, where the paint is exceedingly thin, and between the brushwork of the impasto touches of the lace at the woman's cuff. In contrast to some of Van Dyck's later works, particularly from the 1630s, the forms meet one another tightly, concealing the ground that might otherwise be visible at the junctions.

It is evident from close examination of the picture's surface, from an infra-red photograph and from several paint cross-sections that a certain amount of free underdrawing in a dark translucent paint was used over the ground to mark out the central forms. This can be seen particularly in the outline of the child's head, nose, profile of the lips and around the fingers, and marking out the top of the woman's head and hairband, at her chin and



Plate 7 Anthony van Dyck, *Portrait of a Woman and Child* (NG 3011), c.1620–1. Canvas, 131.5 × 106 cm.





**Fig. 1** Van Dyck, *Portrait of a Woman and Child*. X-ray detail of the child showing the application of lead white in the flesh tones, sleeve and child's ruff.



**Plate 8** Van Dyck, *Portrait of a Woman and Child*. Detail of the child's head.

around her ear. The infra-red photograph and paint sections suggest underdrawing, in dark lines of paint, beneath the background curtain, and there are shaded areas under the woman's embroidered bodice. Infra-red light also reveals a dark, nebulous, roughly rectangular patch beneath the curtain just above the woman's head, suggesting one of the few changes in composition made during the course of execution. The underdrawing material consists of a dark translucent brown pigment such as an umber or Cassel earth. Analysis by EDX confirmed the presence of manganese as well as iron in this material and this result agrees with a neutron autoradiographic study carried out in New York by the Metropolitan Museum on a painting by Van Dyck of c.1624.<sup>8</sup> Dark shading beneath the purple dress in the darkest folds below the child's left arm consists of wood charcoal, while in other pictures bone black has been detected in underdrawing and shading.<sup>9</sup>

The manner of application of the paint layers is probably best judged from the picture itself, since the method of painting is straightforward and direct. X-ray photographs show the constructive brushwork in paint containing large amounts of lead white for the flesh tones, the lace ruffs, the white cloth clutched by the child and the underlayers and highlights of the purple dress (Fig. 1). As with the infra-red image, the composite X-ray photograph shows only the most minor changes of design as the painting proceeded.

Such changes in design as can be detected are confined to some adjustment of the angle of the woman's head, to the pattern of her embroidered bodice and to the precise positioning of the child's outstretched hand.

The palette and layer structure of the picture have been examined in samples and cross-sections and by EDX and XRD analysis. The range of materials employed is not large and proves to be quite standard for the seventeenth century. Subtlety of colour and colour design relies on pigment mixtures and the multi-layered application of paint, and is perhaps most elaborate in the child's purple dress and in the deep red of the background curtain. The flesh tones, which have a dragged, rather desiccated-looking texture, consist principally of lead white, tinted lightly with vermilion to give a pale pure pink tone grading into half shadow produced by the addition of earth pigments (Plate 8). The faintly cool tones of the child's cheek to the left are provided by mineral azurite scumbled over the pink, and similar effects appear to have been used in the woman's face. The whites of the child's eyes are tinged with blue, probably azurite.

Natural azurite, with other pigments, principally small amounts of black, white and a brownish ochre, form the blues and greens of the background landscape, while the dull grey-blue of the sky is composed of pure smalt, and smalt with white and black, with the more grey-blues passing over a grey underpaint in places.

In their manner of execution, the draperies are the most elaborate parts of the picture. The deep crimson curtain framing the sitters is made up of up to five layers of partly blended paint based on vermillion and a deep claret-coloured lake, with black incorporated in the deepest shadows. A red-brown earth is also used (Plate 9). The vermillion is present in two forms: a very finely ground, orange-toned variety and a brighter scarlet type consisting of larger, more angular, particles. With these combinations of pigments and a sequence of layers, a considerable range as well as depth of colour is achieved. Except in the shadows, where the underlayers are red lake with black, the lowermost layer of the curtain is virtually pure orange-coloured vermillion. The final layer is the most glaze-like in constitution and is largely red lake, but there are also highlights of vermillion used at the surface, such as at the fringed edge picked out in opaque bright red pigment to the left and repeated in the small swathe of textile above the child's head. Van Dyck's interest in, and success in, depicting the colours, textures and shine of textiles had clearly developed by this early point in his career: the draperies of the sitters are painted with particular verve and skill. Detail was also important to Van Dyck since he incorporates into the brilliantly executed network of lace at the woman's cuff a few vermillion cross-threads, only visible at close quarters. The woman's black dress combines deep charcoal-black pigment with cool mixed greys and the addition of a small amount of deep red lake to the black pigment in the darks imparts a glossy rich depth. The embroidered brown and gold of the woman's bodice contains ochres and white with occasional dashed highlight touches of lead-tin yellow;<sup>10</sup> the bands of similar colour around the child's upper arms must have been worked in an equivalent way and recall the brilliant effects of embroidered textiles seen in *Susanna Fourment and her Daughter* of about the same date in Washington (National Gallery of Art).<sup>11</sup>

Perhaps the most striking and unusual colour in the painting as a whole is the child's beautiful purple satin dress. The colour varies from almost pure black in the shadow beneath the right arm to pale lilac lights on the folds of the fabric. Mauves and purples were difficult to obtain from the seventeenth-century palette except by mixing, since no pure purple-coloured pigment was available for oil painting. A successful colour could be obtained by combining ultramarine with red lake, with or without white, or by glazing one over the other, but at considerable

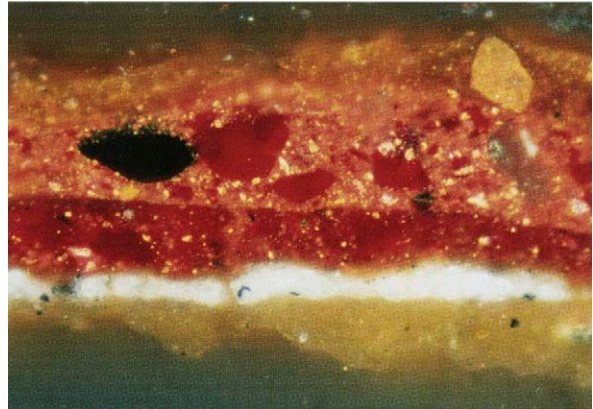


Plate 9 Van Dyck, *Portrait of a Woman and Child*. Cross-section of the red of the curtain with multiple applications of paint containing vermillion, red lake pigment and earth pigments. The double ground is visible beneath. Original magnification 400×; actual magnification 320×.

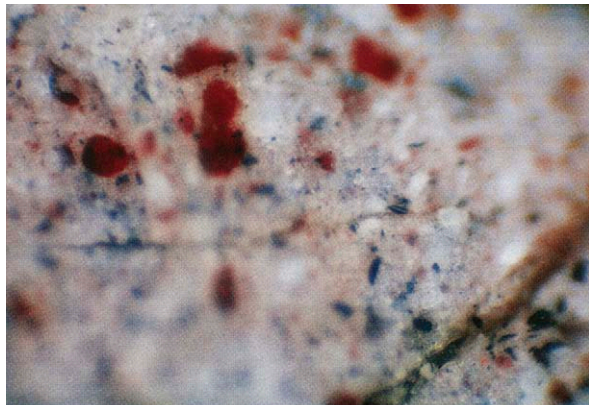


Plate 10 Van Dyck, *Portrait of a Woman and Child*. Top surface of the paint of the child's purple dress containing lead white, red lake and charcoal black. Original magnification 275×; actual magnification 220×.

expense on account of the ultramarine content. Azurite combined with red lakes tends to make more muted greyish mauves. Here Van Dyck uses instead a mixture of varying proportions of white, a red lake and charcoal black<sup>12</sup> over, in the mid-tones and lights, an underpaint of a pure reflective lead white. The specific optical properties of the pigments – as a result of their reflectance and absorption characteristics when combined – yield the strong purple and mauves seen in this drapery (Plate 10), particularly since a light-reflecting layer is present beneath. This technique and the resulting colour had been exploited with considerable success by Rubens in his large panel of *Samson and Delilah* in the National Gallery (NG 6461; c.1609), in which the same combination of pigments occurs in the great swag of purple drapery framing the upper left part of the composition.<sup>13</sup>





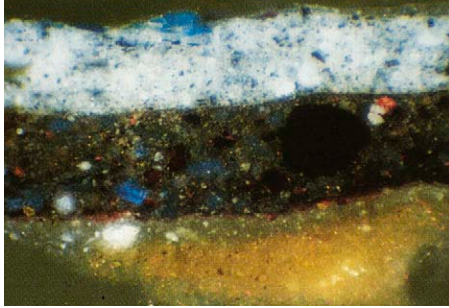
Plate 11 Anthony van Dyck, *Portrait of George Gage with Two Attendants* (NG 49), probably 1622–3. Canvas, 115 × 113.5 cm.

### *Portrait of George Gage with Two Attendants*

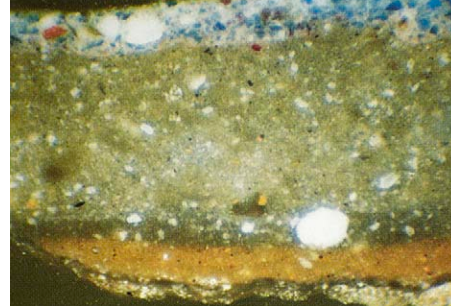
Canvas, overall 115 × 113.5 cm (for thread counts, see text).

This picture (Plate 11) presents a particular problem of interpretation, since it has undergone a significant modification at the right side, where an irregularly shaped strip of canvas, about 21 cm wide at the top and 18 cm at the bottom, has been sewn on to the main piece of canvas. A smaller rectangular addition, also sewn on, makes up the lower right-hand corner (roughly 19 × 8 cm). In his 1970 Catalogue, Martin

speculated that the picture was painted by an unknown artist after a Van Dyck portrait, citing weaknesses in design and execution while acknowledging the problematic condition of the picture.<sup>14</sup> More recent opinion, summarised by Susan Barnes in her catalogue entry for the 1990–1 Van Dyck exhibition held in Washington (National Gallery of Art), reconfirmed the identification of the



**Plate 12** Van Dyck, *Portrait of George Gage with Two Attendants*. Cross-section of blue-grey sky, upper right, on main portion of canvas. The lower two layers of translucent brownish orange and thin grey paints represent the double ground. Under the sky paint there is a dark purple layer, probably a pentimento in the background. Original magnification 220×; actual magnification 135×.



**Plate 13** Van Dyck, *Portrait of George Gage with Two Attendants*. Cross-section of the grey-blue paint of the right-hand figure's sleeve, just to the left of the canvas join, showing the double ground on the main canvas and a thick layer of new grey ground over this. The new ground overlaps the seam from the right-hand canvas addition. Original magnification 155×; actual magnification 100×. (See also Fig. 4.)

main sitter as George Gage, first made by Millar, although rejected by Martin, and concluded that the painting was an autograph Van Dyck, probably painted in Rome, rather than in Antwerp or in England, between 1622 and 1623.<sup>15</sup> The subject is explained by Gage's activities as an agent for Sir Dudley Carleton's art collection, and he was in Rome at the same time as Van Dyck, probably overlapping by eleven months.

X-ray photographs show the sewn right-hand addition very clearly, and also differences in radiographic density between the main part of the composition; but the images of the paint layers, both at the surface and beneath, are difficult to read and ascribe to parts of the composition, visible or concealed. Thread counts of the two canvases made on the radiographic images show the main part to be a finer canvas than the sewn addition (16 × 18 threads/cm as compared to 13 × 14 threads/cm). Cross-sectional samples on either side of the join are of help in establishing the sequence of the grounds and paint layers, and therefore in the interpretation of the evolution of the composition, but there remain questions which cannot be resolved with certainty. It is clear from these technical studies that the addition was not attached before the canvas assemblage was primed for painting; the ground layers on each piece differ. Those on the main portion consist of a somewhat translucent lower ground of a mid red-brown, and over this a thin layer of grey comprising lead white, lampblack and calcium carbonate (Plates 12 and 13).<sup>16</sup> On the added strip there is also a two-layered system, fairly similar in colour, but markedly different in constitution, thickness and texture. A coarse-grained carbon black is present in the upper

grey ground here, while the lower brown layer is a mixture of earth pigments only, resulting in an optically denser priming on the addition.

Examination of the paint layers on each side of the joined canvas suggests that the main part of the painting bearing the figure of George Gage was cut at the right side at an advanced stage in the painting and the addition applied subsequently. The main piece of evidence for this is that the head of the right-hand figure was present before the composition was cut, since the paint layers for the front part of his face – the forehead, part of the eye and nose – come to an abrupt end at the seam joining the two canvases (Figs. 2 and 3). Similar observations can be made for other parts of the present composition in the region of the join, particularly in the grey-blue sleeve of the right-hand figure where the hand, arm and sleeve must always have been present on the main canvas. The X-ray photographs indicate that after the addition had been applied, there was a certain amount of scraping away of paint to the left of the join and ground to the right, followed by the application of a patch of new, relatively thick, grey ground to conceal the seam and prepare the addition for extension of the composition over the join. This ground consists of a mixture of pigments, principally white with a fine-grained black, but also some red lead, small quantities of azurite, red lake and other pigments; it is therefore unlike either of the two earlier grey ground layers on the two joined pieces of canvas (Plate 13).<sup>17</sup> The layer of grey paint forming the new ground is visible in the X-ray as an irregular strip, about 6–9 cm wide, running along the length of the seam, but spreading out beneath the thin paint of the main part of the right-hand figure's head and beneath the antique statue





**Fig. 2** Van Dyck, *Portrait of George Gage with Two Attendants*. Detail of the seam passing through the face of the figure at the right.



**Fig. 3** Van Dyck, *Portrait of George Gage with Two Attendants*. X-ray detail showing the seam joining the right-hand canvas addition. Part of the profile of the figure at the right is just visible to the left of the seam.

both on the added strip and under the legs of the statue on the main canvas (Fig. 4). Examination of cross-sections suggests that there may have been paint as well as priming layers on the addition, although evidently not an extensive or complete composition. For example an irregular oval area of vermillion and red lake, on the addition, underlies the right-hand man's yellow-brown cloak around his shoulder, but bears no relation in form to the paint on top. Similarly a layer containing azurite is present beneath the thigh of the marble statue on the addition.

The sequence of events that might explain these features can be summarised as follows. Van Dyck painted the portrait of George Gage with the two other figures, probably art dealers, with whom it is suggested he is in negotiation. The original format cannot be known, nor can the reason for its cutting down. An extra strip of canvas, already grounded and probably also bearing some incomplete part of a painting, was then sewn on to the main canvas after some partial scraping of the paint layers and ground at the two edges to be joined. A new grey ground was applied over the join, around the profile of the right-hand man's head on the main canvas and under what is now the statue. The right-hand figure was then completed and further finishing touches to unite

the two portions applied over the seam. This was presumably carried out very soon after, since the new ground was apparently still either wet, or soft enough to merge with the paint layers on top, in spite of its strongly siccative constitution.<sup>18</sup>

There were clearly some modifications made to the detail of the earlier design. The X-ray image indicates alterations to Gage's head, particularly the direction of his gaze. Further, it is not certain that the object being displayed for consideration was always a statue, since only brownish and greyish-white drapery was present on the main canvas and the legs of the sculpture appear to have been constructed after the addition had been sewn on. The change in the right-hand man's hand to include the middle finger as well as the thumb pointing to, or grasping, the object on offer may be a late change and possibly also the reworking of Gage's sleeve and cuff to the left. The background to the main sitter may also have been recast somewhat, and there is evidence for an incomplete curtain occupying the upper part of the composition beneath the classical columns: a layer of deep purple paint lies beneath the patch of sky to the right of Gage's head, where there are also signs of late alteration to the architectural setting.

Owing to this complexity, the portrait of George

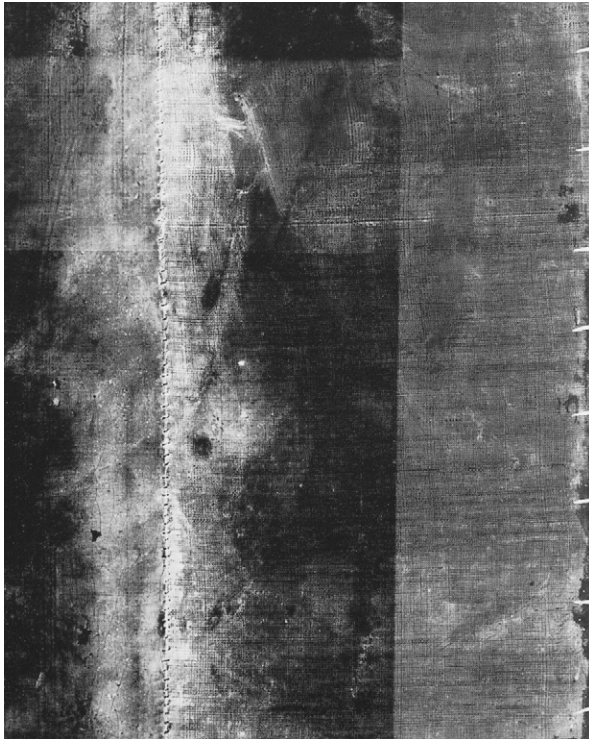


Fig. 4 Van Dyck, *Portrait of George Gage with Two Attendants*. X-ray detail of another section of the seam showing the application of new X-ray-dense ground over the join.

Gage does not present a straightforward example of Van Dyck's technique, although there are other cases of his re-use of canvases and major modification of design at this period in his career, notably the large-scale canvas of *Saint Martin dividing his Cloak*, c.1620, in the Royal Collection (Windsor).<sup>19</sup> The painting of George Gage, however, remains extraordinary for its unusual and innovative subject, which Van Dyck, it appears, had considerable difficulty in crystallising.

### *The Balbi Children*

Canvas, plain weave (tabby),  $11\updownarrow \times 8\leftrightarrow$  threads/cm;  $219 \times 151$  cm.

The sitters are from an aristocratic Genoese family, traditionally thought to be the Balbi, from whom Van Dyck received a number of portrait commissions, but there is no certain identification of the three children; however, this title is retained here. The picture, painted in Genoa between 1625 and 1627 (Plate 15), is on a single piece of coarse canvas, in which a number of prominent weave faults are present. No seams or joins are visible in the X-ray of the picture. The format is similar to a number of Van Dyck's portraits from Genoa, including, for example, *La Dama d'Oro*, *Battina Balbi (?) with Two of her*

*Children* (c.1622, canvas  $218 \times 146$  cm; Genoa, Palazzo Durazzo Pallavicini), *Agostino Pallavicini* (c.1622, canvas  $216 \times 141$  cm; Los Angeles, J. Paul Getty Museum), and *A Genoese Noblewoman with her Child* (c.1623–5, canvas  $218 \times 146$  cm; Cleveland Museum of Art). *Marchesa Balbi*, c.1622, in Washington (National Gallery of Art), however, is somewhat smaller (canvas,  $183 \times 122$  cm).<sup>20</sup>

The ground of the National Gallery picture consists of a single layer of a brownish-cream colour, composed principally of calcium carbonate and silica (silicon dioxide) bound in oil. There are also small amounts of brownish earth and lead white present, but the main component may be a pulverised siliceous limestone or similar deposit (Plate 14).<sup>21</sup> This constitution for a priming is fairly common in seventeenth-century canvas painting both in Italy and Spain and must be regarded as standard practice in a number of locations, particularly in the earlier part of the seventeenth century.<sup>22</sup> There is reason to suspect that the ground now appears darker than when it was originally applied, and this seems to be a general phenomenon for grounds of this type. The various materials that make up the ground are relatively translucent in oil and become more so with age, allowing the colour of the darkened glue size on the canvas beneath to exert an effect. Traditional lining methods and the adhesives used would have exacerbated darkening, as would the retention of old, darkened varnish residues within a relatively absorbent priming. In the *Balbi Children*, large areas of ground in the background setting, the architecture and foreground, are either left unpainted to stand for the mid-tones, or are covered by only the thinnest wash of paint. Since the present varnish on the

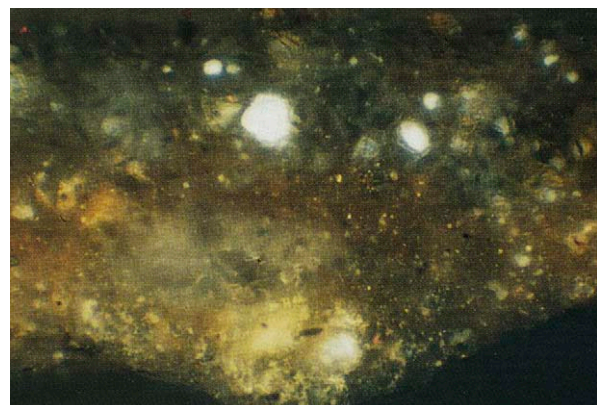


Plate 14 Van Dyck, *The Balbi Children*. Cross-section of the sky paint, upper left, showing severely deteriorated smalt. The translucent grey-brown ground is visible beneath. Original magnification 275 $\times$ ; actual magnification 165 $\times$ .





Plate 15 Anthony van Dyck, *The Balbi Children* (NG 6502), c.1625–7. Canvas, 219 × 151 cm.





Fig. 5 Van Dyck, *The Balbi Children*. Infra-red photograph showing the sketched lines of the initial design.





Fig. 6 Van Dyck, *The Balbi Children*. X-ray detail of the oldest boy.

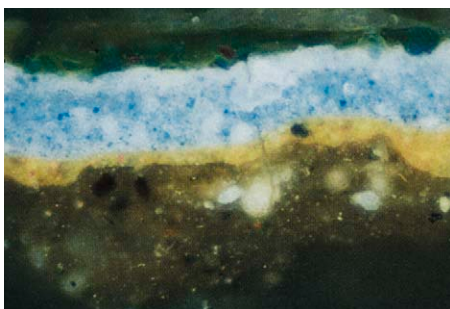


Plate 16 Van Dyck, *The Balbi Children*. Cross-section of mid-blue-green of the curtain with azurite scumbled over a pale blue consisting of indigo and white. A layer of orange-brown earth pigment is present beneath. The lowest layer is the brown ground. Original magnification 400x; actual magnification 240x.

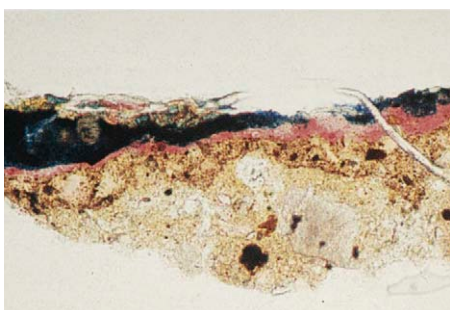


Plate 17 Van Dyck, *The Balbi Children*. Deep blue-green of curtain with pure indigo glazed over a cochineal lake (carmine) and a small amount of natural azurite at the surface. Thin cross-section by transmitted light. Original magnification 250x; actual magnification 150x.

painting is also heavily discoloured, the overall tonality is probably, we must suppose, considerably more sombre than it was originally.

There are other effects involving discoloration that arise from pigment changes: the sky contains heavily discoloured smalt in oil, while the translucent dark brown foliage of the tree in the background consists largely of yellow-brown lake, black and degraded smalt. The oil medium here also appears to have darkened markedly. Where some green colour survives in the foliage, the paint contains verdigris, but a dark colour was evidently intended, since charcoal black is also present in the paint layer. The more obvious green of the sprig of foliage on the steps in the foreground preserves its colour as a result of the use of azurite mixed with yellow lake.<sup>23</sup>

It is evident from infra-red photography that Van Dyck drew the principal outlines of the figures, architecture and other smaller details directly on to the primed canvas, not all of which were followed precisely in the painting stage. There are two types of drawing visible: a dry black broken line, caught on the corrugations of the canvas weave, probably of charcoal or some kind of black chalk, and a more extensive use of fluid dark brown paint as a drawing medium, to reinforce the initial sketch. The dry black underdrawing can be seen most clearly just behind the painted outline of the oldest boy's cape and in the lower part of his costume, his cuffs and kneecap. Similar lines are present in the costumes and heads of the two other children (Fig. 5). The fluid brushed underdrawing in paint is visible in large areas of the composition around the figures and in the architecture, and particularly in areas where Van Dyck has not followed the underdrawn design in paint (Fig. 5). For example, the outline of the oldest boy's red cape was sketched in two different lower positions, not followed at the painting stage, and there are painted corrections to his knee and feet and to the legs and feet of the centre child. These lines are visible through the paint, but are more strongly revealed by infra-red examination, which also brings out the dark framework of the branches and trunk of the background tree, otherwise invisible on the picture. The infra-red image also shows minor details such as the bell attached to the leg of the left-hand chough, drawn but not painted, and a changed design for the hilt of the oldest boy's sword.

The composite X-ray photograph shows some changes made during the course of painting, as well as high radiographic contrast between the figures, particularly the heads of the children, the impasto





Plate 18 Van Dyck, *The Balbi Children*. Detail of the oldest boy's costume showing the application of impasto.

brushwork on their costumes and the background curtain, all of which absorb X-rays strongly, and the relatively radio-transparent background (Fig. 6). The most obvious pentimenti are around the heads of the oldest and youngest children, which were reduced a little in size, and in the lower part of the skirt of the youngest child.

Van Dyck's method of painting for the children's clothes and particularly for the large hanging curtain involves a more extensive glazing technique than is seen in his earlier work and, in fact, is not much used later. This presumably reflects an interest in Venetian methods of drapery painting for which glazes, particularly red lakes and 'copper resinate' types of green glaze, play such an important part. The background curtain to the right is a most elaborate piece of drapery painting and involves undercolours consisting of orange-toned pure vermilion modelled with vermilion, mixed with white and red earth, and then further modelled in two contrasting paints, one based on deep blue indigo and the other on a rich crimson red lake, likely to have been prepared from cochineal.<sup>24</sup> The final shimmering effect of the shot colours was achieved by glazing and scumbling with further red lake, red lake mixed with indigo, and pure indigo. In the lightest greenish-blue areas, there is a final scumble of mineral azurite (Plates 16 and 17).

Vermilion is also prominent in the sitters' clothes, where it is glazed with red lake in the youngest child's dress and used in a more solid form in the oldest boy's costume and in his stockings, which make a visual

pun with the thin vermilion legs of the pair of choughs to which he gestures. Impasto highlights on the gold frogging and embroidery are painted in lead-tin yellow, while the cool, silvery greys of the lace, the ruff and the grey embroidery are a subtle combination of lead white with charcoal black and finely ground pale grey-blue smalt (Plate 18).

As a result of the depth of tone and glaze-like constitution of the dark costume worn by the boy at the centre, and the effect of darkened varnish, the intended colours here are now very difficult to read. Samples show very strongly coloured deep green glazes, based on verdigris in the doublet, which are modelled at the surface discontinuously with a dark red glaze to give a subtle *cangiante* effect to the velvet. The glazes also incorporate black pigment, rendering them profoundly dark. The application of red lake over a green glaze is a method Van Dyck may have borrowed from Venetian painting, in which it occurs widely, but is a technique not seen much elsewhere.<sup>25</sup>

### Charity

Oak panel, 148 × 107.5 cm.

Painted in Antwerp in about 1627–8 after Van Dyck's return from Italy, *Charity* (Plate 19) is the only large-scale panel by the painter in the National Gallery Collection. The panel is a well-made oak construction comprising five vertical planks, butt-joined and glued with dowels (Fig. 7).<sup>26</sup> The ground layers are typical for an oak panel from Antwerp, and consist of a natural chalk lower layer bound in glue, with a very thin light greyish-brown *imprimatura*, probably oil-bound, on top. This *imprimatura* was applied evenly over the chalk ground and does not show the streaked appearance evident in many oil sketches and *modelli*



Fig. 7 Van Dyck, *Charity*. Detail of the back of the thinned oak panel after removal of the cradle, showing original dowel at a join.





Plate 19 Anthony van Dyck, *Charity* (NG 6494), c.1627–8. Oak panel, 148 × 107.5 cm.



Fig. 8 Van Dyck, *Charity*. Infra-red photograph of the whole, showing initial sketched design in a dry drawing material and in fluid paint.

on panel, by Rubens, for example, and even on large fully worked-up paintings such as his *Samson and Delilah* (NG 6461).<sup>27</sup>

In designing *Charity*, Van Dyck seems to have used the underdrawing method noted above for the *Balbi Children*. There are traces in the infra-red photograph (Fig. 8) of a dry, dark drawing material around the main forms, particularly the babies' heads, hands and feet and also marking out the main fold lines in Charity's draperies. Working with the brush, these outlines were then re-inforced with a fluid warm dark red-brown paint, which can be seen on the surface of the picture, where the forms do not quite meet, as in, for example, the junctions of Charity's hand and her drapery, and defining the outlines of the babies' legs. This brushed underdrawing is more elaborate than the initial sketch, however, and infra-red examination indicates it to be an important and extensive stage in the genesis of the composition, fixing all the principal forms and their overlaps and allowing Van Dyck to leave reserves for each major element in the design. Because the ground and *imprimatura* do not exert an important effect on the

X-ray image of the painting, these reserves appear as particularly striking areas of contrast between X-ray dense areas, such as Charity's white drapery and the thinly painted arm of the right-hand child stretched across it, which registers as dark in the image (Fig. 9). Similarly, the heads of the two other babies are dark patches against drapery and sky paints. The strong modelling of the forms, where the paint layers contain substantial amounts of lead white, and the variety of brushwork types are also very clear from X-ray photographs (Fig. 10). Charity's white drapery is painted in long fluid strokes of some thickness, whereas the flesh tones are executed very smoothly, first by a stippling action, evident in the X-ray, then brushed out and blended from the lights to the shadows, effacing virtually all texture. This kind of effect is only really achievable on panel and must have been a reason for the choice of a wood support rather than canvas in order to produce a rather enamel-like finish to the flesh painting.<sup>28</sup> A panel had perhaps been specified in the commission.

The X-ray photograph also shows how little modification was made to the design during the



Fig. 9 Van Dyck, *Charity*. Composite X-ray photograph showing the variety of brushwork in the painting and the use of reserves for forms.

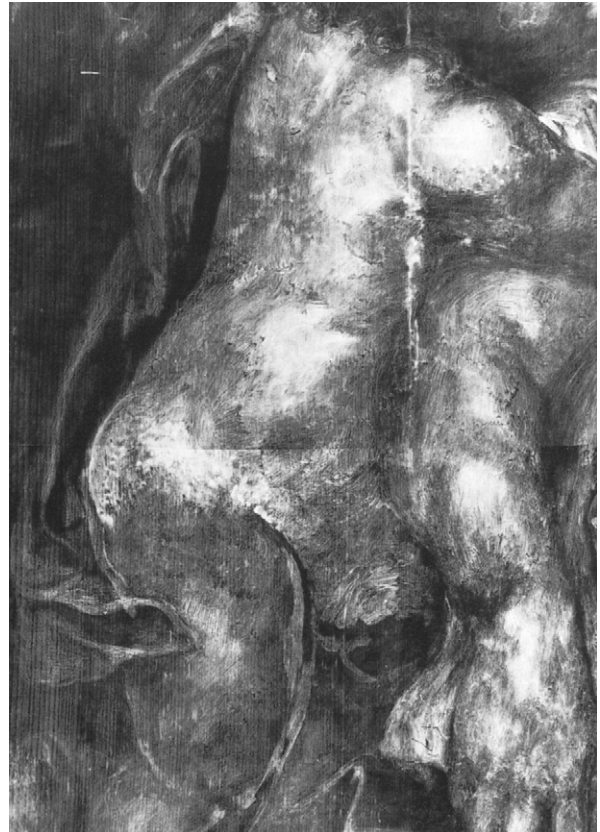


Fig. 10 Van Dyck, *Charity*. X-ray detail of the body of the child at the left, showing the brushwork in the build-up of the flesh tones.

course of painting. The only pentimento of any significance involves the blue drapery around Charity's neck, which also floats behind her. Initially, it appears, this was to be a smaller area of blue, with a patch of white drapery occupying the position just around and behind the left-hand child's head. This was then painted over with ultramarine and connected to the blue around Charity's neck by glazing ultramarine over her shoulder to make a continuous and larger area of blue. Some undecipherable change to the background appears to have been made beneath the wide dark strip in the background to the left, but this registers only in the infra-red photograph.

Van Dyck's *Charity* is generally seen as a strongly Venetian-influenced work with Titian-like colouring. While this is clearly so for the design, and in the powerful combination of relatively unbroken colours of the blue, red and white draperies, there is evidence that Van Dyck intended a rather more muted effect. This interpretation rests on the observation that colour has changed in the picture and on the detection of unstable pigments. The sky paint, for example,

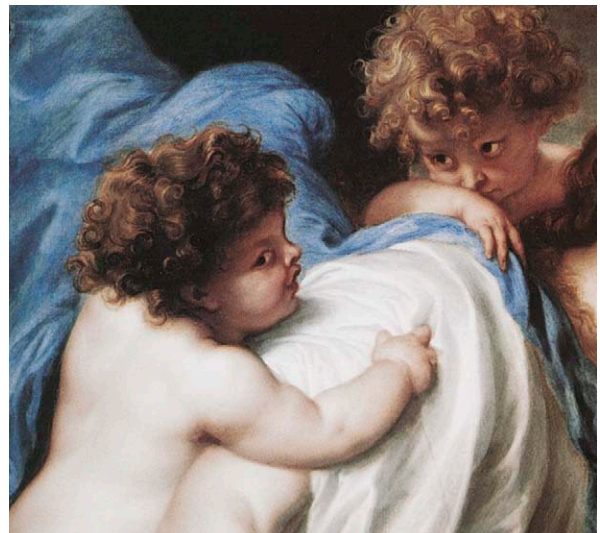


Plate 20 Van Dyck, *Charity*. Detail of Charity's ultramarine-containing drapery.

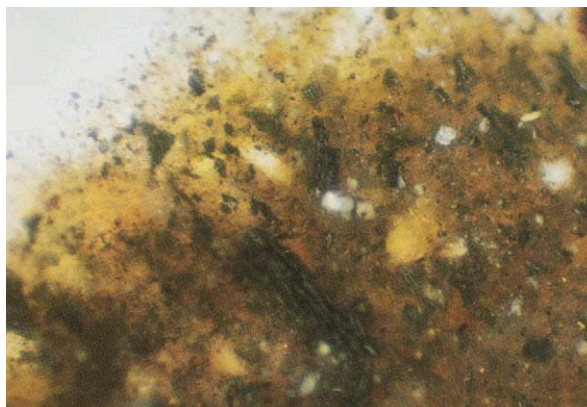




**Plate 21** Van Dyck, *Charity*. Cross-section of Charity's brownish-red drapery, lower left edge. There is an underpaint of vermilion, earth pigments and white and over this an orange-red glaze containing red and yellow lake pigments. The chalk ground and a very thin greyish-brown *imprimatura* are visible beneath. Original magnification 400x; actual magnification 320x.

consists of smalt with white, which has discoloured to some degree; however, a stormy sky with areas of grey was intended, since some parts consist just of grey paint, and where there is smalt it is underpainted with a layer of grey. Since brilliant blue natural ultramarine is used elsewhere in the picture – in Charity's fluttering blue drapery – a powerfully Italianate blue sky was clearly not Van Dyck's choice. Similarly, although the rich, pure bright colour of ultramarine in a drapery is Venetian in conception, in Charity's drapery here it is underpainted with a very strongly coloured deep blue-green layer of indigo, which shifts the colour to a rather more greenish and dark tone than ultramarine otherwise would exhibit (Plate 20). In fact, in the shadows of the blue drapery at the left and in the swathe at Charity's neck, only indigo is present.

There are other signs of Van Dyck's intention to diminish the strength of the pure bright colours that his choice of palette for this picture would have permitted and this is particularly the case in the large area of red-brown drapery that occupies the lower third of the picture. This drapery is constructed from several pigments combined in a variety of ways in order to produce a range of colour, light and shade. It is apparent also that there has been some colour change, presumably as a result of the action of light, since a strip of drapery about two cm wide at the left edge is a rather brighter, more cherry-red colour than the paint it adjoins, and must have been protected from light by an earlier frame or moulding. The paint here consists of a mixture of red and yellow lake pigments (Plate 21). The red component has been



**Plate 22** Van Dyck, *Charity*. Olive-brown of the curtain, upper right. Top surface of a paint sample containing yellow lake pigment, some yellow ochre and charcoal black. Original magnification 275x; actual magnification 220x.

identified as a lake produced from a cochineal dyestuff, while the translucent yellow is presumably a plant dyestuff-based lake.<sup>29</sup> Both would be vulnerable to the action of light, and would tend to produce a colour shift towards a browner or more orange tone in the initial phases of fading. In the brownest areas of the drapery, there are mixtures of yellow lake with charcoal black, giving the paint a very dark olive undertone, and there are also areas glazed in Cassel earth, which in oil medium functions as a warm brown glaze. The lightest, pinkish-brown tones are thinner glazes of red and yellow lakes over a pale pink preliminary layer of lead white tinted with a little vermilion, laid in at the first stage of the drapery painting to represent just the highlight areas; the X-ray image shows this stage of underpainting clearly.

The method of construction of this drapery is therefore rather complex, but subtle transitions of colour are involved, and since the extent of colour change cannot be known, Van Dyck's precise intentions are difficult to judge: it is certain, though, that a straightforward Venetian type of deep red drapery, based on purple-red-toned glazes, was not his aim. Although altered by colour change in some of the pigments, a more subtle, less vivid colour effect would have resulted from the method of painting employed. In the background curtain, to the right, and in the very dark panel behind the figure of Charity to the left, dark glazes similar to those used for the deepest shadows of the drapery are present: charcoal black with yellow lake for the former and Cassel earth in the latter, and these features also serve to lower the overall key of the painting (Plate 22).





Plate 23 Anthony van Dyck, *Carlo and Ubaldo see Rinaldo conquered by Love for Armida* (NG 877.2), 1634–5. Oak panel, 57 × 41.5 cm.



### *Carlo and Ubaldo see Rinaldo conquered by Love for Armida*

Oak panel, 57 × 41.5 cm.

Painted in *grisaille* on an oak panel, and squared for transposition of the design to an engraving plate. The composition was engraved as a direct copy, that is, not in reverse, by Pieter de Jode the Younger in 1644; Van Dyck's composition is earlier and thought to date from 1634–5 (Plate 23). The panel for this *modello* is made up of two vertical oak planks, one slightly wider than the other (average 26.3 cm wide, and average 15.1 cm wide), bearing a clear Antwerp panel-maker's mark of a castle and the palms of two hands on the wider plank (Fig. 11) and the initials 'MV', probably for Michiel Vriendt, cut into the back of the narrower member. This Antwerp mark was in use between 1619 and 1638.<sup>30</sup> Under the semi-monochrome paint layers, there is a pure white chalk ground, and an exceedingly thin greyish *imprimatura*. It is not known whether it was common for the *imprimatura* for panel paintings, and perhaps the chalk ground also, to be applied by the painter's workshop rather than by the panel-maker, although it seems likely that fully grounded and primed panels were also available from stock in the Low Countries and certainly in the Netherlands.<sup>31</sup> The ground structure and *imprimatura* are very similar to those on Van Dyck's *Charity*, described above.

The first stage of execution by Van Dyck was a very fine brushed underdrawing in dark greyish-brown and translucent deep brown paints, applied directly over the *imprimatura*. This follows Van Dyck's usual practice, although on a more delicate scale, of drawing in more than one colour of fluid paint; this can be seen, for example, in the raised arm of the putto to the left, the upper profile of which is drawn in a greyish-brown tone, whereas the lower edge of the arm is marked by a thin line of semi-transparent dark brown. Examination of the painting under the stereomicroscope has shown that the next stage was the application of a few crucial details at the centre of the composition in drawn lines and small patches of a rich red-brown paint, not used anywhere else in the composition.<sup>32</sup> The largest area of this kind is the warm deep shadow around the left side of Armida's face and over her left breast, and the smaller area of shadow under her right eye (Plate 24). A similar paint can be seen in the left eye and around the face of the putto leaning on Rinaldo's arm as well as in the head and body of the putto at the left edge of the composition (Plate 25).

After this, Van Dyck worked up the composition

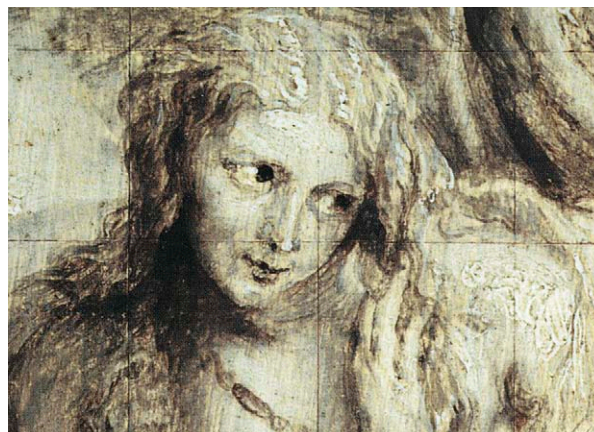


Fig. 11 Van Dyck, *Carlo and Ubaldo see Rinaldo conquered by Love for Armida*. Detail of the reverse of the panel, showing the panel-maker's brand for the City of Antwerp.

using modelling and further more linear brushwork, first in thin warm brown tones, followed by areas of thin greyish modelling. The last stages would have been the application of white and greyish-white highlights in lead white and lead white combined with a little black pigment. The initially applied browner shadows are largely Cassel earth, with some black pigment and a small proportion of finely ground, pale-coloured azurite, likely to have been added to assist the paint to dry (Plate 27). The grey wash-like tones of the early stage of the painting consist of finely ground wood charcoal mixed with lead white and chalk.

Close examination of the way in which the grid of incised lines cuts through the paint indicates, strongly, that the squaring up must have been carried out by Van Dyck or by a studio assistant and not as late as the engraving derived from it. The incisions pass through most of the paint layers, but they do not divide the final, thickest, small highlight touches of pure lead white, applied at the very last stage of painting, for example those on Armida's nose, the top of Rinaldo's boots, the small glass decanters in the foreground, and elsewhere (Plate 26). There is no doubt that these highlights are original. Clearly, Van Dyck's aim was a composition designed from the outset as a source for an engraved print.

**Plate 24** Van Dyck, *Carlo and Ubaldo see Rinaldo conquered by Love for Armida*. Detail of Armida's head, showing the warm red-brown shadows of the early stage in the design and the subsequent application of browns, greys and whites.



**Plate 25** Van Dyck, *Carlo and Ubaldo see Rinaldo conquered by Love for Armida*. Detail of the putto leaning on Rinaldo's arm. Red-brown paint marks out the left-hand side of the head and the left eye.



**Plate 26** Van Dyck, *Carlo and Ubaldo see Rinaldo conquered by Love for Armida*. Detail of the decanters, foreground, lower edge, right. The final white impasto highlights are not bisected by the incised lines of the grid.



**Plate 27** Van Dyck, *Carlo and Ubaldo see Rinaldo conquered by Love for Armida*. Paint sample from brownish glaze for foliage, upper right, containing Cassel earth, charcoal black and a little white pigment. There is also some finely ground azurite present. Top surface. Original magnification 240x; actual magnification 200x.

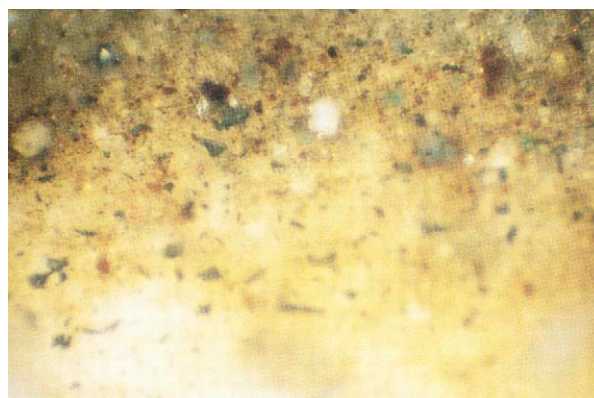






Plate 28 Anthony van Dyck, *The Abbé Scaglia adoring the Virgin and Child* (NG 4889), 1634–5. Canvas, 107 × 120 cm.

### *The Abbé Scaglia adoring the Virgin and Child*

Canvas, plain weave (tabby): 14↑ × 13↔ threads/cm;  
107 × 120 cm.

Painted in Brussels about 1634–5 (Plate 28), the donor has been identified as the Abbé Scaglia from an engraved portrait in *The Iconography* and from the documented full-length portrait of the same sitter, currently on loan to the National Gallery (*The Abbé Scaglia*, probably 1635; Fig. 12). There is also a drawing by Van Dyck of the donor's head in the British Museum. The composition showing the Abbé Scaglia with the Virgin and Child derives from a lost painting by Titian and a pen and ink sketch of the

design occurs in Van Dyck's Italian sketchbook held in the British Museum (Fig. 13).

The oval field of the National Gallery picture occupies the whole of the rectangular landscape-format canvas, the periphery of which was evidently marked out in fluid brownish-black paint as the first stage of the design. Traces of the drawn oval can be seen when the picture is removed from its frame and the surrounding unpainted light greyish-brown ground is also exposed. The ground consists of a



Fig. 12 (left) Anthony van Dyck, *The Abbé Scaglia*, c.1635. Private Collection. Detail of the head.

Fig. 13 (above) Anthony van Dyck, drawing after Titian, in his Italian sketchbook. London, British Museum.

Fig. 14 (below) Van Dyck, *The Abbé Scaglia adoring the Virgin and Child*. Infra-red photograph.





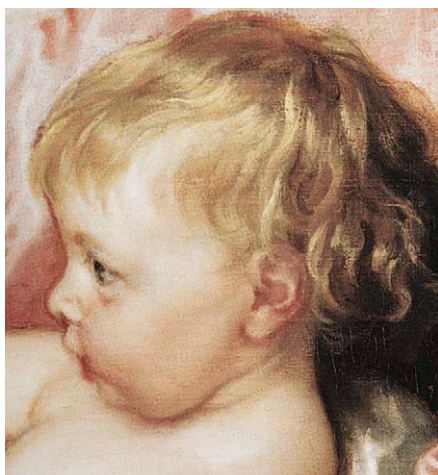


Plate 29 Van Dyck, *The Abbé Scaglia adoring the Virgin and Child*. Detail of the Child's profile.

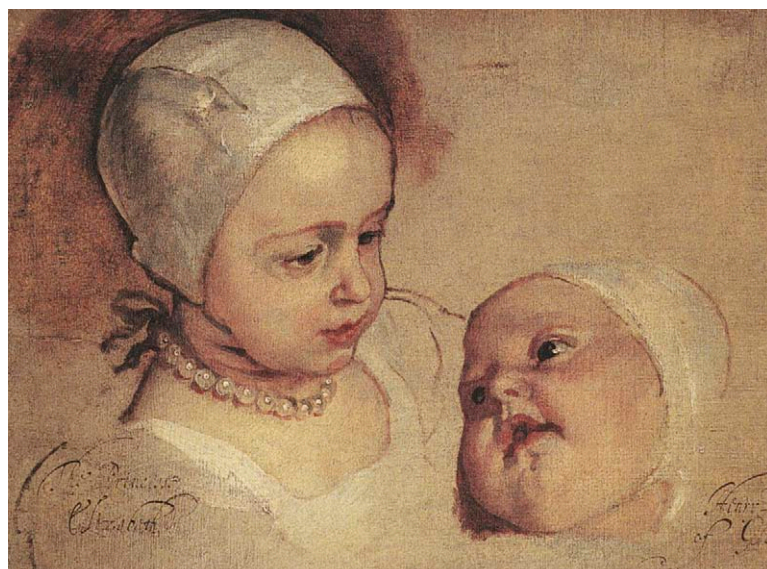


Plate 32 Anthony van Dyck, *The Princesses Elizabeth and Anne*, Edinburgh, National Portrait Gallery, c.1635–40. Detail. Oil on canvas, 29.8 × 41.8 cm.



Plate 30 Van Dyck, *The Abbé Scaglia adoring the Virgin and Child*. Detail of Abbé Scaglia's head.



Plate 31 Van Dyck, *The Abbé Scaglia adoring the Virgin and Child*. Detail of the Virgin's pink drapery.

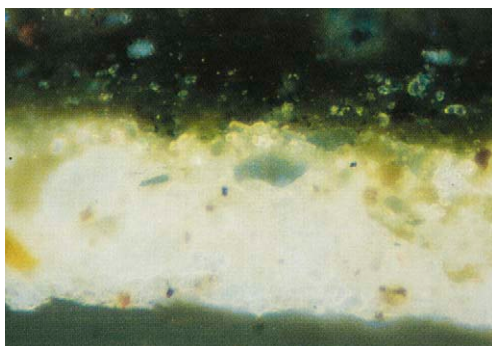
single coherent layer of lead white combined with some charcoal black, Cassel earth and a little yellow earth. This simple priming structure, the main components of which are lead white in oil, is probably partly responsible for the very well-preserved state of the picture. A similar ground occurs in Van Dyck's large-format family group portrait, *Count John Nassau-Siegen and his Family* (Sussex, Firlé Estate), painted in Brussels in 1634, but there it forms the upper ground of a two-layered system.<sup>33</sup>

Further drawing of the design in dark paint, which follows Van Dyck's habitual manner of working, is evident from an infra-red photograph, and is particularly visible in the Virgin's draperies, her face and hands and those of the donor (Fig. 14). Drawing in paint, involving warmer colours, occurs in the figure of the Child, around the chest and arms and in the definition of the profile of the face (Plate 29). Infra-red light also reveals two important pentimenti. A dark strip of shadow under part of the blue drapery at the Virgin's right knee, running to the lower edge of the composition, indicates that initially Scaglia's black sleeve and robe were broader and further to the right. In the final design Van Dyck also raised the Child's foot by about two cm and the infra-red image shows a patch of shadow placed to define the first position of the sole of the foot, using a technique seen also in the oil sketch on canvas of the *Princesses Elizabeth and Anne* (Plate 32) where the back of Princess Elizabeth's head is marked by a halo of thin

dark paint. (See also *Lord John Stuart and his Brother, Lord Bernard Stuart*, pp. 80–1.)

The pure blue sky of *The Abbé Scaglia adoring the Virgin and Child* is painted using high-quality lapis lazuli ultramarine, mixed with white. The greyish-mauve parts of the sky, seen around the donor's shoulders, consist of charcoal black with white and some red lake and red earth pigment (Plate 30).

The method of painting as a whole is assured and straightforward; it is only in the execution of the Virgin's draperies that any complexity occurs. In both the blue and red of the Virgin's dress, three or four separate tones and constitutions of paint are used to achieve the final results. The shadows of the blue fabric covering the Virgin's knees were blocked in first using a dark shade of indigo mixed with white, followed by a lighter tone of a similar composition to indicate the mid-tones. The final layers consist of glazes of natural ultramarine, varying in thickness according to the modelling beneath. The upper part of the dress relies on the range of colour qualities of three differently toned reds: vermilion, red lake and a strongly coloured brownish-red earth; these are combined with white pigment and charcoal black in certain areas. Modelling of the mid-tones was carried out first in a pure pink tint of vermilion mixed with white, followed by the shadow values in a paint of unmixed red-brown earth. The upper layers consist of pink paints comprising red lake and white, red lake glazes, with charcoal black added to the lake in the darkest, most saturated shadows of the folds, particularly to the right of the dress in the sleeve (Plate 31). Some fading of the red lakes at the surface has allowed the colour of the brownish underlayer containing earth pigment to become more prominent.



**Plate 33** Van Dyck, *The Abbé Scaglia adoring the Virgin and Child*. Cross-section of deep green curtain with a lead-tin yellow and azurite underpaint and a glaze containing indigo and black. The single beige ground is visible beneath. Original magnification 735×; actual magnification 440×.

The combination of colours in the draperies, with blues based on indigo and ultramarine and the red and pink dress influenced by the use of lake glazes, as well as the cool white and subtle grey of the cloth in which the Child is wrapped, strongly echoes the colour composition of *Charity*, which also has a dull greenish curtain in the background to the right, although in the present picture the colour key as a whole is rather higher.

The background curtain in *The Abbé Scaglia adoring the Virgin and Child* is painted as a scumble of indigo and a little white, or a glaze of very intense indigo where the curtain is in deep shadow, over a solid mid-green underlayer consisting of azurite mixed with lead-tin yellow (Plate 33). To the right, where the curtain possesses a dark greenish-brown tone, the surface glaze of indigo passes over a mid-brown underlayer of black and white with red and brown earth pigments.

### *Lady Elizabeth Thimbelby and Dorothy, Viscountess Andover*

Canvas, plain weave (tabby): 11↑ × 11↔ threads/cm;  
132 × 149 cm.

Painted in England around 1637, this represents two sisters, Elizabeth at the left, and Dorothy at the right, daughters of Thomas, Viscount Savage (Plate 34). The painting was probably commissioned to mark Dorothy's marriage in 1637 to Charles Howard, Viscount Andover, and this accounts for the winged putto with a basket of roses, attribute of Saint Dorothy, patron saint of brides and newly-weds.

The canvas is a single piece of fairly coarse linen and the format is similar to several of Van Dyck's double portraits from this period, notably *Thomas Killigrew and William, Lord Crofts* (signed and dated 1638, canvas, 133 × 144 cm; Windsor Castle, Royal Collection) and *Thomas Wentworth, 1st Earl of Strafford with Sir Philip Mainwaring* (1640, canvas, 123 × 140 cm; Wentworth Woodhouse, Earl Fitzwilliam).<sup>34</sup> For *Lady Thimbelby and Viscountess Andover*, the ground is a double-layered system with a lower layer of a strong red-brown comprising mainly red iron oxide combined with calcium carbonate, over which a mid grey-brown priming was applied, consisting of lead white, charcoal black and some red and brown earth pigment (see Plate 37).<sup>35</sup> This upper ground colour can be glimpsed in a few places through the overlying paint layers, for example at the junction of the basket and Lady Elizabeth's white dress, although in this composition the ground is in the main fully concealed by paint.





Plate 34 Anthony van Dyck, *Lady Elizabeth Thimbelby and Dorothy, Viscountess Andover* (NG 6437), c.1637. Canvas, 132 × 149 cm.



Fig. 15 Van Dyck, *Lady Elizabeth Thimbelby and Dorothy, Viscountess Andover*. Detail of Viscountess Dorothy's head.



Fig. 16 Van Dyck, *Lady Elizabeth Thimbelby and Dorothy, Viscountess Andover*. X-ray detail of Viscountess Dorothy's head.

As in many of Van Dyck's paintings, the first stage of execution was an outline sketch in brushwork to fix the essentials of the composition. This was carried out in a thin warm brown paint, and traces can be seen at the surface outlining the lower edge of Viscountess Dorothy's arm and particularly in the profile of the winged putto. The infra-red photograph reveals little more of this underdrawing than can be seen with the naked eye. Paint cross-sections show a certain amount of underpainting in a few passages, but this is not so extensive as to merit the description of the underlayers as a 'dead coloured' stage. Underpaint layers are apparent in, for example, the yellow dress, the basket of flowers and the background curtain.

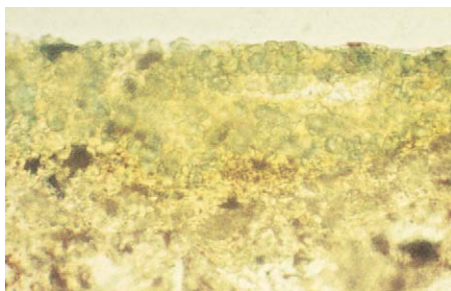
Much of the painting was composed *alla prima* in the most direct manner and this emerges also from the X-ray image, which shows the heads of the sitters boldly and simply worked within the outlines of the brushed underdrawing (Figs. 15 and 16). Very few pentimenti are present, only the suggestion of a suppressed background column behind and just to the left of Viscountess Dorothy's head, which is visible also in an infra-red photograph, and some minor adjustment around the tops of the sitters' heads and

to their hairstyles, although even as detailed a feature as the ringlets on Viscountess Dorothy's forehead was left in reserve, having been allowed for in the planning, since these are not painted over the flesh tone.

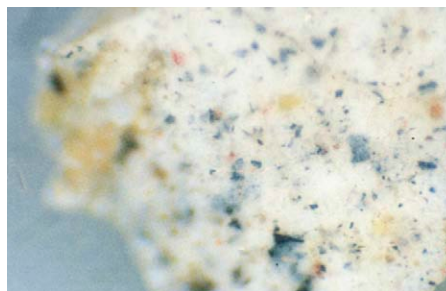
The palette for *Lady Thimbelby and Viscountess Andover* is fairly standard for the period, and the following have been identified in samples: smalt, azurite, ultramarine (in minor quantities), green verditer,<sup>36</sup> vermilion, red and yellow lakes, lead-tin yellow, a variety of earth pigments including Cassel earth, black pigments and white. These pigments are used singly and in mixture to form the paint layers; the binding medium has been identified as linseed oil throughout the picture (see the section on Van Dyck's medium, pp. 84–6).

The bluer parts of the sky are painted in smalt of a grey-blue tone, and blended into darker greys in which black pigment, mixed with some smalt, predominates, while the strongest blue patch at the horizon, near Lady Elizabeth's forearm, contains smalt and white mixed with red lake to produce a greyish-mauve tone. The very dark green background curtain, against the sky, has a glaze-like quality for the fabric. It is painted in a mixture of green verditer





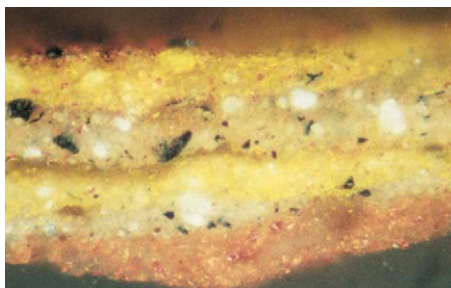
**Plate 35** Van Dyck, *Lady Elizabeth Thimbelby and Dorothy, Viscountess Andover*. Thin cross-section of the green background curtain. The paint consists largely of artificial malachite (green verditer) and yellow lake pigment. Transmitted light. Original magnification 700×; actual magnification 420×.



**Plate 38** Van Dyck, *Lady Elizabeth Thimbelby and Dorothy, Viscountess Andover*. Paint sample from the flesh of Lady Elizabeth's hand containing lead white, red earth, vermilion, Cassel earth, golden ochre, charcoal black and a small quantity of natural ultramarine. Top surface. Original magnification 275×; actual magnification 165×.



**Plate 36** Van Dyck, *Lady Elizabeth Thimbelby and Dorothy, Viscountess Andover*. Detail of the winged putto's drapery.



**Plate 37** Van Dyck, *Lady Elizabeth Thimbelby and Dorothy, Viscountess Andover*. Cross-section of the orange paint of Viscountess Dorothy's satin sleeve comprising several layers of strongly coloured yellow earth pigment, vermilion, white and black. The lowermost two layers of orange-brown and grey represent the double ground. Original magnification 400×; actual magnification 240×.

(artificial malachite) and yellow lake, with, in the shadows, the same combination of pigments and the addition of a great deal of charcoal black (Plate 35). The stronger, more opaque greens of the rose leaves in the basket held by the putto, on the other hand, consist of lead-tin yellow, yellow lake and azurite.

The winged putto's pinkish-red drapery is based on vermilion with white, glazed in the shadows with red lake (Plate 36), and the much darker red-brown tones of Viscountess Dorothy's silk shawl are produced by combinations of finely ground vermilion, red earth and black pigment, mixed, but not glazed, with red lake. Lead-tin yellow ('type I')<sup>37</sup> is responsible for the bright yellow, highest impasto parts of the Viscountess's golden satin dress and also for the embroidery on Lady Elizabeth's fawn-coloured shawl. The darker, more golden, tones of the dress consist of a deep yellow ochre with white and a little crystalline red earth (haematite), while the more orange colours of the sleeve contain a higher proportion of haematite, as well as lead-tin yellow, yellow ochre and red lake (see Plate 37). The plain whites of Lady Elizabeth's dress are just pure white, painted over an understructure made up of cool and warmer greys, the cool tones containing wood charcoal while the warmer brownish greys incorporate Cassel earth.

Van Dyck's simple but highly accomplished working of the flesh tones makes use of virtually pure lead white with very small quantities of finely ground red earth, vermilion and Cassel earth in the lights, grading to tones which are just a shade darker and creamier by the addition of a little translucent golden ochre and small quantities of black pigment. For the distinctly cool shadows, for example of Lady Elizabeth's raised hand, Van Dyck has added just a trace of lapis lazuli ultramarine (Plate 38).

### *Equestrian Portrait of Charles I*

Canvas, herringbone-weave ticking; 367 × 292 cm.

This is one of two equestrian portraits of Charles I by Van Dyck and thought to date from 1637–8 (Plate 39); the composition and its relationship to a smaller version in the Royal Collection, once thought to be a *modello* for the National Gallery picture, are discussed by Gregory Martin, who suggested that the picture at Windsor is based on NG 1172 and is not a preliminary work.<sup>38</sup> The second composition, also in the Royal Collection, painted slightly earlier in 1633, *Charles I with M. de St Antoine*, is roughly the same size as the National Gallery picture, measuring 368 × 270 cm. There is a drawing in the British Museum which might be related to the present composition.

The canvas support for this life-size equestrian portrait is made up of two roughly equal-size pieces of thick, heavy canvas ticking with a tight herringbone-weave and a striped pattern, apparently in black (Fig. 17).<sup>39</sup> The warp threads run horizontally and the adjacent edges of the two sections of canvas roughly bisect the centre of the composition, in a line just below the horse's bit, the armour covering King Charles's thigh and through the neck of the equerry holding the helmet at the right side. The canvas pieces are now held in place by a lining canvas, with chalk putty filling the join between the two sections, but there is evidence that originally the two were sewn together and there is still some stitching to be seen at the right side in an X-ray photograph. It seems likely that the herringbone-weave canvas was preferred because of its particular strength and low tendency to sag or distort when used for such a large composition; it is significant that a similar canvas made of ticking was used for the even larger Pembroke Family Group at Wilton House.<sup>40</sup> The back of the original canvas of the National Gallery painting carries the stamp of Charles I's collection (Fig. 18).

The canvas bears a double ground: a thin red-brown lower layer, principally reddish ochre and calcium carbonate,<sup>41</sup> with a second oil-based priming of a light, slightly brownish grey. This second ground is composed of lead white with charcoal black and some brownish ochre or Cassel earth (Plate 40). The thinness of the lower ground appears to be connected with the tight patterned weave of the canvas, and it only just fills the interstices of the grain. The upper light-coloured ground is thicker; it seems probable that the primed canvas was made up specially in Van Dyck's studio for this commission from the royal household.

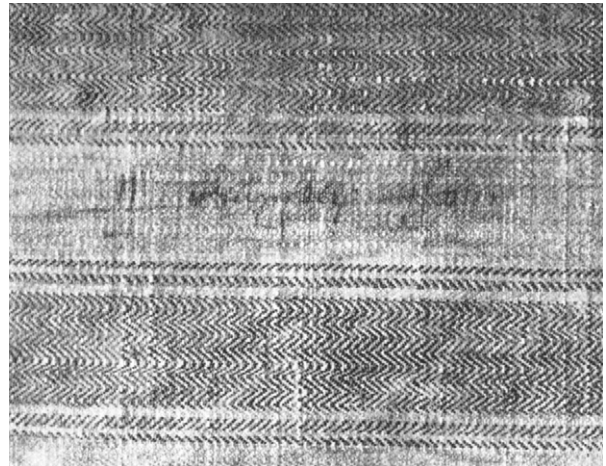


Fig. 17 Van Dyck, *Equestrian Portrait of Charles I*. Detail of the original canvas (herringbone ticking).

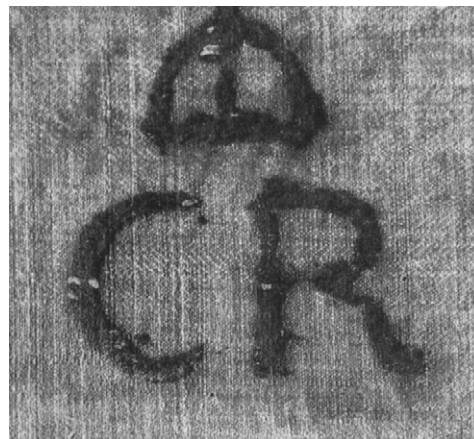


Fig. 18 Van Dyck, *Equestrian Portrait of Charles I*. Detail of Charles I's collection mark on reverse of original canvas.

A single sample of sky paint and ground was taken at the time of the cleaning of the painting in 1952. For the purposes of the present technical description, a few further samples were taken to establish the materials used, but they do not provide a complete survey of the artist's technique. As in other of his compositions, Van Dyck's preliminary drawing on the ground is sketched then worked up in fairly broad brushwork using a dark brown translucent paint. This is now difficult to make out on the picture, since the surface is dark, and the varnish discoloured and also a little blanché. However, outlines of forms can be seen where the paint is sketchy and cursorily applied, as in the canopy of branches overhanging the King's head and in the foreground, particularly around the horse's hooves and legs. Initial planning of the design was clearly quite thorough, since reserves are left for details as minor as the grey-green leaves of the wilting thistle in the lower left corner.





Plate 39 Anthony van Dyck, *Equestrian Portrait of Charles I* (NG 1172), c.1637–8. Canvas, 367 × 292 cm.

An infra-red photograph brings out the dark painted lines of the first stages of sketching rather more clearly, and reveals, particularly, changes to Charles's *culet* – the armour protecting his hips – which was first painted lower and much narrower, and also shows modifications to the rear part of the saddle and saddle cloth (Fig. 19). Gregory Martin suggested that the skirt of the rear part of the armour – the *culet* – in its present position, was a later addition, probably not by Van Dyck;<sup>42</sup> it can be seen in the infra-red photograph to pass over the sky and part of the background foliage behind the sitter and is painted rather differently from the rest of the armour.

The dominant tonality of the picture is muted and low in key; this is partly intentional, but there are also changes in the materials of the painting which must have increased the effect. The sky paint consists of greyish-blue smalt mixed with white, with a thin discontinuous layer of natural ultramarine and white painted on top in the bluest areas (Plate 40); nevertheless the colour overall is rather sombre. Martin believed that the upper layer of sky paint was badly damaged,<sup>43</sup> but this seems not to be the case, although there is some blanching in the ultramarine-containing paint, and, in addition, the smalt has probably partially discoloured. The slightly greyish blues of the saddle cloth consist of indigo mixed with white; cross-sections show the blue pigment has faded quite badly. The brownish reds of this cloth are made up of red lake pigment mixed with vermilion containing particularly fine needle-shaped particles. Some loss of colour of the lake seems likely, since where it is protected from light under overlying paint layers the colour is richer and stronger. The reds and brownish reds of the equerry's sleeve employ similar mixtures of red lake and vermilion over a red-brown underpaint of red earth pigment, black and white.

The dark glazes used for foreground, foliage and middle distance consist of mixtures of a variety of types of ochre, Cassel earth and black, with yellow lake, while the stronger colours of greenish foliage contain mineral azurite, ochre, yellow lake and black, in various proportions according to the colour and opacity of the paint. The more translucent greens contain a higher proportion of azurite and lake; those which are more solid incorporate white pigment and ochre. In spite of the darkened varnish on the picture, the reflections painted as white highlights on the King's armour and the touches of gold in lead-tin yellow on the stirrup still catch the light as Van Dyck intended.

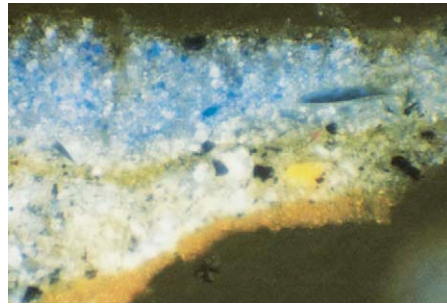


Plate 40 Van Dyck, *Equestrian Portrait of Charles I*. Cross-section from the brightest blue of the sky, upper left, containing lapis lazuli ultramarine and smalt, with an underlayer containing smalt. The double ground of red-brown followed by warm grey can be seen beneath. Original magnification 200×; actual magnification 120×.



Fig. 19 Van Dyck, *Equestrian Portrait of Charles I*. Infra-red photograph detail, showing modifications to the figure of the King.



### ***Lord John Stuart and his Brother, Lord Bernard Stuart***

Canvas: 10↓ × 12↔ threads/cm;<sup>44</sup> 237.5 × 146 cm.

This late, life-size double portrait (Plate 41) shows the two youngest sons of the 3rd Duke of Lennox, Lord John Stuart on the left, and Lord Bernard Stuart slightly in front at the right; it is thought to date from 1638 or early in 1639 when the Stuart brothers left England to tour the Continent for three years. The technique is characteristic of certain of Van Dyck's late portraits in which all painterly attention is devoted to the figures of the sitters and their draperies and little to the background and setting, which are left in a cursory sketchy state. *The Portrait of Sir Thomas Chaloner*, c.1637, in Leningrad (The State Hermitage Museum) and *Olivia Porter, Wife of Endymion Porter*, also c.1637 (Private Collection), represent similar cases from this period.<sup>45</sup>

The National Gallery double portrait is painted on a medium-weight plain-weave canvas with a single layer of light biscuit-coloured ground made of lead white mixed with a fairly small quantity of translucent brown earth, probably Cassel earth. Preliminary drawing in thin dark paint of the figures and the designs of their draperies is extensive and unusually detailed; it can be seen on the surface of the picture and more clearly in an infra-red photograph. It is perhaps most obvious along the outlines and edges of Lord Bernard's blue and silver cloak, around his chin, gloved hand and calfskin boots (Fig. 20). Similar underdrawing is used for the figure of Lord John, but it is broader and freer in style. The infra-red photograph also shows a very dark oval patch framing Lord Bernard's head, made up of a layer of charcoal black pigment beneath the thin wash-like brown background, and this was evidently used to frame and place the head before it was painted (Fig. 20). It is part of the first compositional phase involving the underdrawing. Van Dyck used a similar device early in the painting to frame the head in the full-length *Portrait of the Abbé Scaglia* of about 1635, currently on loan to the National Gallery (Private Collection). The head of Lord John Stuart lacks this dark surround, but the curls and waves of the hair of both young men are evident in the underdrawn stage of the heads left in reserve in the background (Fig. 21).

The greys and browns of the architectural background setting are painted extremely thinly and sketchily in single layers of white with varying proportions of semi-translucent earth pigments and black. The loose and evidently rapid fluid brushwork can easily be made out on the picture surface,



**Plate 41** Anthony van Dyck, *Lord John Stuart and his Brother, Lord Bernard Stuart* (NG 6518), 1638–9. Canvas, 237.5 × 146 cm.

particularly in the plinth and steps to the left, where the ground can be seen through the thin surface paint.

The draperies are constructed in a more elaborate and highly finished manner. The sections of blue satin of Lord Bernard's clothes are undermodelled with indigo in the shadows and indigo combined with white for the mid-tones (Plate 42).<sup>46</sup> The surface was then scumbled with greenish mineral azurite and azurite mixed with indigo using a technique that follows the painting of the background curtain in the earlier *Balbi Children*. The final effect in the use of these materials lends a particular richness and sheen to the painting of the fabric. Lord John Stuart's brown and gold costume (Plate 43) is a similarly accomplished piece of painting and employs a technique close to that used for Viscountess Dorothy's yellow and gold dress in the double portrait of *Lady Thimbelby and Dorothy, Viscountess Andover* painted about a year earlier. In Lord John's drapery the brightest, lightest yellow highlights are pure lead-



Fig. 20 Van Dyck, *Lord John Stuart and his Brother, Lord Bernard Stuart*. Infra-red photograph detail showing initial dark sketching lines and lay-in.



Fig. 21 Van Dyck, *Lord John Stuart and his Brother, Lord Bernard Stuart*. Detail of Lord Bernard's head.

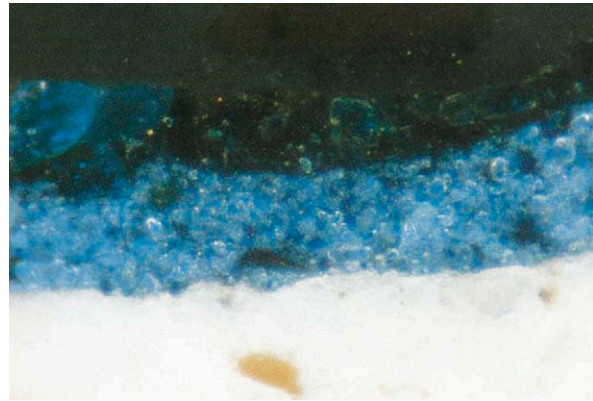


Plate 42 Van Dyck, *Lord John Stuart and his Brother, Lord Bernard Stuart*. Cross-section of the dark blue satin of Lord Bernard's cloak with azurite and indigo at the surface over a layer of indigo and white. The light biscuit-coloured ground is visible beneath. Original magnification 700x; actual magnification 420x.



Plate 43 Van Dyck, *Lord John Stuart and his Brother, Lord Bernard Stuart*. Detail of Lord John's brown and gold costume.

tin yellow, which grade into darker more golden-brown colours incorporating yellow ochre, lead white and some crystalline red earth pigment (haematite). The deeper, brownish glaze-like shadows consist largely of a reddish ochre with Cassel earth and some yellow ochre. Analytical examination of the organic components of the glaze-like darker yellows showed the incorporation of a bistre or pitch-like material, derived from pyrolysed birch tree bark (*Betula alba*).<sup>47</sup> The medium in these passages has been identified as walnut oil (see also p. 86).

Van Dyck evidently used this dark translucent bistre fairly widely in the darks of the picture, since it occurs also in the dark brown background behind Lord John Stuart, as well as in a dark shadow of the grey and silver lining of Lord Bernard Stuart's cloak; in both these areas the medium is linseed rather than walnut oil.



## Notes and references

1. Relatively few pictures in Italy are on panel at this date and also rather few in England. In Flanders, however, large-scale panel supports of oak were still common at the beginning of the seventeenth century, for example Rubens's great altarpiece, *The Descent from the Cross*, painted 1611–14 for Antwerp Cathedral, the central panel of which measures 4.21 × 3.11 m. Each wing measures 4.21 m × 1.53 m. See A. Philippot and P. Philippot, 'La descente de croix de Rubens: technique picturale et traitement', *Bulletin de L'Institut Royal du Patrimoine Artistique*, VI, 1963, pp. 8–9.
2. Painting on copper panel supports allows even more refined and detailed brushwork and a very high degree of finish. See M.K. Kommanecky, I. Horovitz and N. Eastaugh, 'Antwerp Artists and the Practice of Painting on Copper', *Painting Techniques: History, Materials and Studio Practice*, Preprints of the IIC Dublin Congress, 7–11 September 1998, ed. by A. Roy and P. Smith, London 1998, p. 139.
3. See C. Christensen, M. Palmer and M. Swicklik, 'Van Dyck's Painting Technique, His Writings, and Three Paintings in the National Gallery of Art' in *Anthony van Dyck*, exh. cat., National Gallery of Art, Washington, ed. by A.K. Wheelock, S.J. Barnes and J.S. Held, Washington DC, 1990, pp. 45–52.
4. Paint samples from the National Gallery Van Dycks were examined by standard methods in use in the Scientific Department of the National Gallery, particularly optical and scanning electron microscopy (with EDX analysis of cross-sections), X-ray diffraction analysis, gas-chromatography linked to mass-spectrometry, Fourier-transform infra-red microspectrophotometry (FTIR) and high-performance liquid chromatography (HPLC).
5. G. Martin, *National Gallery Catalogues, The Flemish School, 1600–1900*, London 1970, pp. 26–67.
6. The canvas thread counts are averages taken from X-ray images of the paintings. The vertical double arrow represents the thread count in the vertical direction and vice versa.
7. See Christensen, Palmer and Swicklik, cited in note 3, pp. 47–9.
8. M.W. Ainsworth et al., *Art and Autoradiography: Insights Into the Genesis of Paintings by Rembrandt, Van Dyck and Vermeer*, The Metropolitan Museum of Art, New York 1982, pp. 12–18.
9. Ainsworth et al., cited in note 8, p. 18.
10. Lead-tin yellow shown to be 'type I' by XRD. See JCPDS File No. 11–233.
11. Wheelock, Barnes and Held, cited in note 3, cat. 21, pp. 135–7.
12. Charcoal black (small cole) was known to be a cool, bluish black. '...note that Small cole or Charcole is a blew blacke, & Sea cole makes a Red Blacke...' in BL MS Harley 6376, f.92. This optical property was exploited in the mixtures to create purple colours when combined with white and red lake, or, for duller colours, in combination with red earth.
13. See J. Plesters, '"Samson and Delilah": Rubens and the Art and Craft of Painting on Panel', *National Gallery Technical Bulletin*, 7, 1983, p. 45 and Plates 5g–l, pp. 48–9.
14. Martin, cited in note 5, pp. 58–61. Martin describes the picture as 'After (?) van Dyck'.
15. Wheelock, Barnes and Held, cited in note 3, cat. 30, pp. 158–61.
16. Calcium carbonate confirmed in the upper ground by EDX.
17. This new grey ground is fairly thick and highly heterogenous; moreover, the constitution varies from place to place. Although dominantly a grey colour consisting principally of lead white with a carbon black pigment (not charcoal), also present in varying quantities are azurite, red lead, red lake and a number of different earth pigment types. It is possible, therefore, that this layer is composed of 'palette scrapings', that is, recycled paint from the palette or *pencelier*. Material of this kind is strongly drying on account of the partially polymerised oil present, as well as the drying influence of certain pigments. See also note 18 below.
18. In addition to the lead-white content which exerts a siccative action on the oil medium, azurite and red lead are also strongly drying pigments.
19. *Saint Martin dividing his Cloak* (overall 258 × 243 cm) in the Royal Collection has an original canvas strip addition at the right-hand side, about 38 cm in width. This modification seems to relate to major changes that Van Dyck made to the composition during execution particularly in the background architecture and figure group to the right. See Oliver Millar, *The Tudor, Stuart and Early Georgian Pictures in the Collection of Her Majesty the Queen*, Text Volume, London, 1963, p. 104. Cross-sections taken by Aviva Burnstock in 1990 on either side of the seam joining the added strip to the main canvas showed that this was grounded after the strip was attached, and that the priming passes over the ground layers on the main canvas. Unpublished report in the Scientific Department.
20. Wheelock, Barnes and Held, cited in note 3, Fig. 2, p. 144; cat. 25, pp. 147–9; cat. 37, pp. 178–9; cat. 24, pp. 144–6.
21. Mineral deposits of siliceous limestones or calcareous sandstones are common at many geographical locations. Materials such as these may have found application as canvas grounds in the seventeenth century; it is unlikely there would be a particular source or fixed constitution.
22. Other seventeenth-century canvas paintings with similar brown single grounds include works by Cavallino, Reni, Caravaggio, Pietro da Cortona, Salvator Rosa, Poussin, Sassoferrato, Velázquez and Zurbarán. Grounds of this type are best identified by XRD in conjunction with EDX analysis.
23. Even though the yellow component of azurite and yellow lake mixtures is vulnerable to fading and consequent colour change in the paint, this combination of pigments often retains a strongly green colour. This is probably because the azurite generally possesses a distinctly greenish tinge and also when it

- is coarsely ground tends to require a large amount of lake pigment to make a workable paint film. There is therefore a 'reserve' of unfaded yellow colour in the paint layer.
24. Indigo identified by FTIR. The red lake as derived from a cochineal dyestuff was suggested by transmittance microspectrophotometry in the visible region of the spectrum.
  25. Red lake glazes over translucent greens were widely used in Venetian painting, for example on Cima's altarpiece *The Incredulity of Saint Thomas* (NG 816), on panel, of 1504. See J. Dunkerton and A. Roy, 'The Technique and Restoration of Cima's "The Incredulity of S. Thomas"', *National Gallery Technical Bulletin*, 10, 1986, pp. 15–16 and Plates 2h–k, pp. 12–13.
  26. The panel for *Charity* consists of five oak planks with the grain running vertically, butt joined and dowelled. At some stage the panel had been thinned to 8mm and a cradle applied. This was removed during conservation treatment on acquisition in 1984. Details are recorded in the 'Conservation Dossier'.
  27. The 'striped' *imprimatura* is very evident on Rubens's *Samson and Delilah* (NG 6461), and in other works by the artist, see Plesters, cited in note 13, Fig. 10, p. 37, and Fig. 14, p. 39. See also Fig. 13, p. 38, for '*Le Chapeau de Paille*' (NG 852), and Fig. 7, p. 34 for *A Lion Hunt* (NG 853.1). Some further notes on *imprimatura* on panel of this kind can be found in N. van Hout, 'Meaning and Development of the Ground Layer in Seventeenth Century Painting', in *Looking Through Paintings: The Study of Painting Techniques and Materials in Support of Art Historical Research*, ed. by E. Hermens, Leids Kunsthistorisch Jaarboek XI, Leiden 1998, pp. 205–10.
  28. Van Dyck's brilliant and expressive painting methods and brushwork were commented on quite early, a good example being R. de Piles's account in *Abrégé de la vie de peintres, avec des réflexions sur leurs Ouvrages, Et un Traité du Peintre parfait; De la connoissance de Desseins; De l'utilité des Estamps*, 2nd edn., Paris 1715, pp. 403–8, particularly p. 407.
  29. Microscopic examination of samples of drapery paint suggested that two lake pigments, a red and a yellow, had been mixed to produce the desired colour. Examination of the dyestuffs present in samples by HPLC indicated that the red lake had been derived from a species of cochineal insect, in all probability the Mexican insect *Dactylopius coccus* Costa, although the chromatogram was somewhat obscured by the presence of the yellow pigment dyestuff. The yellow was present in quantities too small to be identified. See J. Kirby and R. White, 'The Identification of Red Lake Pigment Dyestuffs and a Discussion of Their Use', *National Gallery Technical Bulletin*, 17, 1996, pp. 56–80, particularly pp. 67, 73.
  30. J. Wadum, 'The Antwerp Brand on Paintings on Panel', in Hermens ed., cited in note 27, pp. 179–90.
  31. An account of standard-size panels and their supply is given in E. Van der Wetering, 'Painting Materials and Working Methods of the Young Rembrandt', *Rembrandt: The Painter at Work*, Amsterdam, 1997, pp. 11–17.
  32. It is noticeable that in a number of drawings by Rubens, particularly landscape studies, there is often a small amount of red chalk drawing combined with a more extensive use of brown and black chalk and inks. This is particularly clear in *A Wagon fording a Stream* (NG 948; c.1635), in which the composition was begun roughly at the centre in red chalk and then elaborated in black chalk. Other examples are illustrated in C. Brown, *Making and Meaning: Rubens's Landscapes*, National Gallery exh. cat., London 1996, Figs. 84, 85, 88, 89 and 90, pp. 87–92. The technique is also used in figure groups and portraits, see J.S. Held, *Rubens: Selected Drawings*, Oxford 1986, pp. 19–23; plates 3, 6 and 7.
  33. Samples from the Firlie Van Dyck were examined at the National Gallery on behalf of International Fine Art Conservation Studios (Bristol), who restored the painting in 1993.
  34. See Wheelock, Barnes and Held, cited in note 3, cat. 84, pp. 313–15; cat. 86, pp. 320–2.
  35. Double grounds of this type for portraits on canvas continued in use in England until at least the late 1640s, for example in the work of Sir Peter Lely (1618–80). See E. Hendriks and K. Groen, 'Lely's Studio Practice', *Hamilton Kerr Institute Bulletin*, 2, 1994, pp. 21–37.
  36. Green verditer is manufactured green basic copper carbonate, that is, artificial malachite, and possesses a spherulitic, even-sized particle form. The pigment is generally not very strong in colour but makes satisfactory greens when mixed with yellow pigments.
  37. Identified by XRD. See also note 10.
  38. Martin, cited in note 5, pp. 41–7.
  39. The 'Conservation Dossier' for NG 1172 contains only a black and white photograph of the back of the original canvas of the picture and the stripes on the ticking are very dark. Since the painting has a lining canvas it is now impossible to gain access to the back of the original, but it is plausible that the stripes are in fact a very deep blue rather than black.
  40. The canvas ticking for the Wilton House Van Dyck has dark blue stripes, where the threads have been dyed with indigo. Samples supplied in 1988 by International Fine Art Conservation Studios (Bristol) who undertook conservation work on the picture.
  41. Calcium carbonate in the lower ground identified by EDX.
  42. Martin, cited in note 5, p. 42.
  43. Martin, cited in note 5, p. 41.
  44. No X-ray plates are available for the picture and the canvas weave was measured on the surface of the painting in places where the background paint is very thin. The thread count is therefore a rough estimate in this case.
  45. Wheelock, Barnes and Held, cited in note 3, cat. 80, pp. 302–3; cat. 83, pp. 310–12.
  46. Indigo identified by FTIR.
  47. The identification of the birch pitch pigment is reported in R. White and J. Pilc, 'Analyses of Paint Media', *National Gallery Technical Bulletin*, 16, 1995, pp. 90–1 and p. 95.