National Gallery Technical Bulletin

VOLUME 35

Joshua Reynolds in the National Gallery and the Wallace Collection

National Gallery Company
London

Distributed by
Yale University Press

This edition of the *Technical Bulletin* has been supported by the American Friends of the National Gallery, London with a generous donation from Mrs Charles Wrightsman

Series editor: Ashok Roy

© National Gallery Company Limited 2014
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 storage and retrieval system, without prior permission in writing from the publisher.

Articles published online on the National Gallery website may be downloaded for private study only.

First published in Great Britain in 2014 by
National Gallery Company Limited
St Vincent House, 30 Orange Street
London WC2H 7HH

www.nationalgallery.co.uk

British Library Cataloguing-in-Publication Data.
A catalogue record is available from the British Library.

ISBN: 978 1 85709 556 2
ISSN: 0140 7430
1038962

Publisher: Jan Green
Project Manager: Claire Young
Editor: Lise Connellan
Design: Libanus Press
Picture Research: Suzanne Bosman
Production: Jane Hyne and Penny Le Tissier
Repro by Alta Image
Printed in Italy by Conti Tipocolor

FRONT COVER
Joshua Reynolds, *Lady Cockburn and her Three Eldest Sons* (NG 2077), 1773 (detail)

TITLE PAGE
TOP LEFT: Joshua Reynolds, *Mrs Mary Robinson ('Perdita')*, The Wallace Collection (P45), 1783–4 (detail).
TOP RIGHT: Joshua Reynolds, *Colonel Tarleton*, The National Gallery (NG 5985), 1782 (detail).
BOTTOM LEFT: Joshua Reynolds, *Miss Jane Bowles*, The Wallace Collection (P36), 1775–6 (detail).
BOTTOM RIGHT: Joshua Reynolds, *Mrs Susanna Hoare and Child*, The Wallace Collection (P32), 1763–4 (detail).

Photographic credits

BOSTON
© 2015 Museum of Fine Arts, Boston: 18, 78.

CAMBRIDGE
© Fitzwilliam Museum, Cambridge: 7.

EDINBURGH
Scottish National Gallery
© National Galleries of Scotland: 21.

HOUSTON
© The Menil Collection, Houston, photo Hickey-Robertson, Houston: 17.

INDIANAPOLIS
© Indianapolis Museum of Art, Indiana: 145.

LONDON
© The British Museum: 90, 138.
© The National Gallery, London: 2, 13, 14, 20, 23, 27–9, 31, 33–41, 45, 46, 48–54, 57–66, 69–72, 75, 76, 79, 81, 85–8, 92, 93, 96–112, 116, 118–25, 129, 131–4, 137, 139, 140, 142, 143, 147, 149–52, 155, 156, 161, 162, 166, 167, 169–71, 173–80, 182, 183, 188–91, 194–202, 205–8, 210, 216, 217.

© National Maritime Museum, London: 1, 32.

© Royal Academy of Arts, London: 25, 26.

© Tate 2015: 16.

© The Wallace Collection, London: 4–6, 15, 30, 44, 55, 73, 74, 80, 83, 84, 94, 95, 117, 153, 154, 157, 163, 165, 168, 172, 187, 204, 211–14.
© The Wallace Collection, photo: The National Gallery, London: 8, 9, 12, 24, 42, 43, 47, 56, 67, 68, 77, 82, 89, 91,113–15, 126–8, 135, 136, 141, 144, 146, 148, 158–60, 164, 181, 184, 185, 192, 193, 203, 209, 215.

© The Wallace Collection, London, photo Anna Sandèn: 130.

NEW HAVEN
© Yale Center for British Art, New Haven, Connecticut: 10, 11, 19, 186.

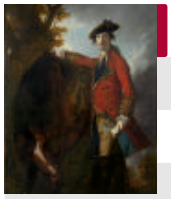
OXFORD
© Copyright in this Photograph Reserved to the Ashmolean Museum, Oxford: 3.

ST PETERSBURG
© With permission from The State Hermitage Museum, St Petersburg, courtesy of Kamilla Kalinina and Elizaveta Renne; 22.

National Gallery

Chronology of the paintings by Joshua Reynolds discussed in this Technical Bulletin

Wallace Collection

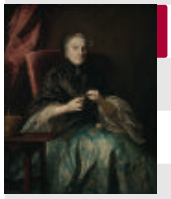


1756

1757

1758

1759



1760

1761

1762

1763

1764

1765

1766

1767

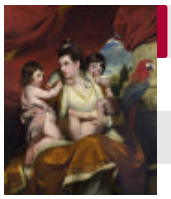
1768

1769

1770

1771

1772



1773

1774

1775

1776

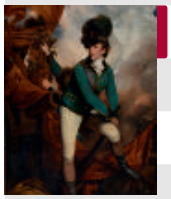
1777

1778

1779

1780

1781



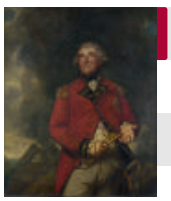
1782

1783

1784

1785

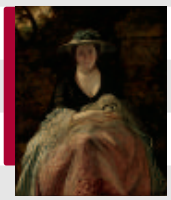
1786

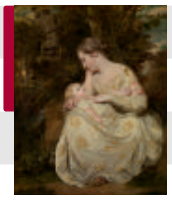


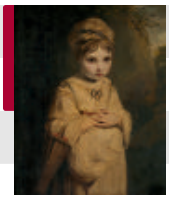
1787

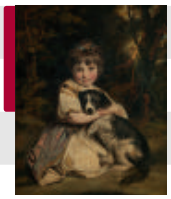
1788

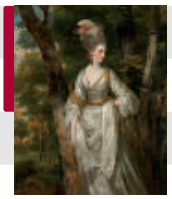
1789

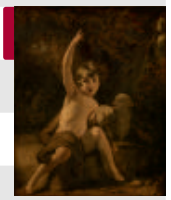


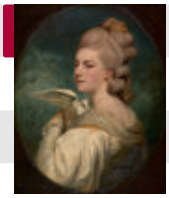


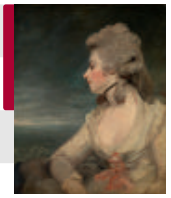


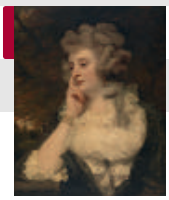












CAT. 9

Mrs Elizabeth Carnac

The Wallace Collection (P35)
1775–6
241.5 × 148.3 cm (whole-length)
Thread count of canvas: 20 vertical, 19 horizontal per cm^2 (twill weave)

Mrs Elizabeth Carnac sat for her portrait in the period 1775–6, just before travelling with her husband, Brigadier-General John Carnac, to Bombay (FIG. 126). The 'Sitter Books' for these years do not survive, but the fashion for the coloured feathers worn by Mrs Carnac in her hair date the painting to this period.[1] The Carnacs departed from England at short notice and the portrait was left in Reynolds's hands. The painting was engraved in 1778 by John Raphael Smith and the proof impression was owned by Thomas Lawrence.[2] Mrs Carnac died in India in 1780 and John Carnac never returned to England, so the portrait was not collected and remained in Reynolds's studio until it was sold in his sale at Greenwoods in 1796.[3]

FIG. 126 Joshua Reynolds, *Mrs Elizabeth Carnac*, 1775–6. Canvas, 241.5 × 148.3 cm. The Wallace Collection, Inv. P35.

The twill-weave canvas was prepared with a single layer of white ground containing both calcium carbonate and lead white (see FIG. 13, p. 17).[4] In cross-section, fine particles of a blue pigment, probably Prussian blue, were visible throughout the ground, probably added with the intention of brightening the white tone. A few brown particles were also visible in some cross-sectional samples.[5] In the X-ray image (FIG. 127) there is banding along the left side, which appears to be produced by variations in thickness of the ground and/or paint layers. The darker areas correlate with the tacking or lacing points used when the canvas was stretched, as indicated by the pattern of cusping along this edge. This may show that the canvas was slightly buckled, so that the ground was applied unevenly, the thickness varying.

The initial painting of the classical costume, with its satin-like appearance and crisp stylised folds, appears to be the work of a drapery painter or studio assistant,[6] but there are numerous pentimenti related to subsequent adjustments that are most likely to be attributable to Reynolds himself. Many of the changes seem to have been made to create a more dynamic appearance in order to suggest that the figure is moving through the wooded landscape. The drapery on the proper right side has been generally reduced: in the X-ray image a mass of drapery is visible around the figure's forearm and in the infrared reflectogram a loop of fabric can be seen below her hand; both features have been painted out in the final composition. The proper right edge of the skirt

FIG. 127 *Mrs Elizabeth Carnac*, X-radiograph.

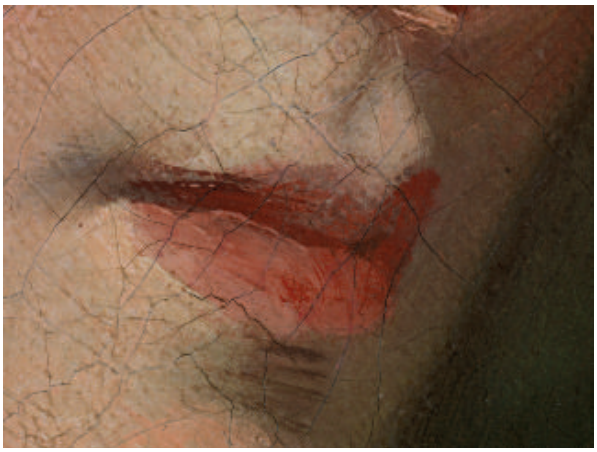


FIG. 128 *Mrs Elizabeth Carnac*, detail.

has also been pulled back towards the figure's legs to create a less vertical line. At the back of the skirt, more fabric has been added and the folds in the foreground have been flattened and extended out towards the right side of the composition as if dragging on the ground. In addition, the figure's proper right shoulder has been lowered and the neckline slightly more revealed out on the proper left side. A pentimento of a pink feather is visible at the back of her towering hairstyle. The overlying dark paint has become more transparent over time and the pink-coloured paint can be seen quite clearly through the green foliage. This area is thinly painted, so it is not visible in the X-ray image, but a reserve can be seen in an infrared reflectogram.[7]

The grouping of trees on the right-hand side of the painting has undergone several changes. In the X-ray image a larger reserve can be seen for the tree on the far right. A vertical trunk appears to have been laid in above and slightly to the right of the figure's head, which is not visible in the final composition. The edge of a tree, which crosses the wide tree trunk to the right of the figure, can be seen in the X-ray image and infrared reflectogram

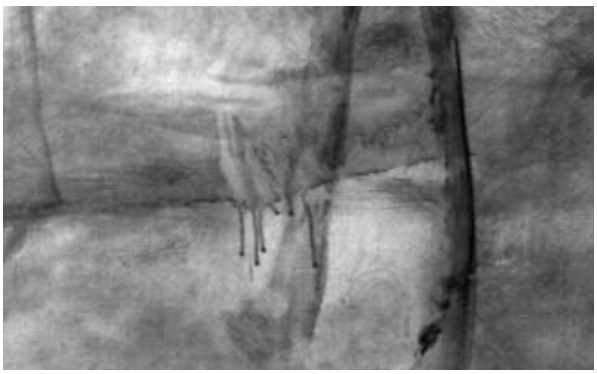


FIG. 129 *Mrs Elizabeth Carnac*, detail of infrared reflectogram.

and is also visible as a pentimento on the painting itself.

The strongly lit areas of the figure's flesh, such as her temple and décolletage, as well as the pink carnation of the outward-facing cheek, have been thickly applied and textured brushstrokes are clearly visible. During the final stages of painting, the shadows and contours around the figure's features have been refined using smaller brushstrokes, as in, for example, the series of dark, oblique lines below her lower lip (FIG. 128).

In areas of the background, the paint was quite fluid and once applied began to collect along the edges of brushstrokes and, in places, flow down the canvas. The most striking example of this is the fluid beige and brown paint used to depict the rocks in the foreground to the left of the figure, where the paint has dried, preserving the drips. In the infrared reflectogram very thin fluid runs of paint can also be seen where a glaze was applied over an area of the landscape (FIG. 129). The paint has pooled along the lower edge of the brushstroke before it ran down the canvas.

Recent conservation treatment to remove discoloured varnish layers revealed some discrete brushstrokes in the foliage paint that show a stronger fluorescence under ultraviolet light than the surrounding paint (FIG. 130).[8] This suggests that there may be some variation in the paint medium in these individual applications, which Reynolds perhaps added as the final touches during his late modifications to the picture. The medium is based on heat-bodied linseed oil throughout the

FIG. 130 *Mrs Elizabeth Carnac*, detail photographed in ultraviolet illumination during varnish removal.

painting. Samples from the brushstrokes that fluoresce were found to contain an additional material, probably a type of resin from a Leguminosae source, such as a copaiba balsam or hard copal.[9] In contrast, samples from green paint that did not appear to fluoresce and probably arise from the initial painting of the foliage, showed no evidence of any additional media combined with the heat-bodied linseed oil. Other areas of the background that seem to have been reworked provided further evidence for the inclusion of resin in the paint medium of the final layers. The fluid, blue paint in drips containing Prussian blue and lead white at the upper left,[10] the beige paint on the left edge used to block out the patch of light sky visible between the trees, and the pale green paint of the foreground near the adjusted bottom edge of the drapery, all appear to be passages which have been modified. In each case analysis again indicated the presence of some resin in the medium, probably of the copaiba balsam type, in addition to the heat-bodied linseed oil. The specific components detected by GC–MS were different from those found in the brushstrokes that fluoresce, perhaps suggesting that two different types of resin were used.[11]

A cross-section from the foreground near the centre of the lower edge (FIG. 131) illustrates that the paint layer structure can be complicated, even in passages where straightforward build-up might be expected. The upper layers in this sample all exhibit a degree of fluorescence under ultraviolet light (FIG. 132), which correlates with the analytical results, suggesting a resinous component in the medium. A sample from a red touch of paint on foliage on the right-hand side suggests once again that the medium in this passage is not just oil (FIGS 133, 134). The upper orange red layer has been applied over a translucent interlayer and a highly fluorescent lower paint layer that appear to have been worked wet in wet.

The work of assistants seems evident in this full-length portrait, especially in the costume. However, changes made to the drapery and the variety of glazes applied in the background show Reynolds's propensity to make the picture his own by finishing and retouching the canvas in the final stages.

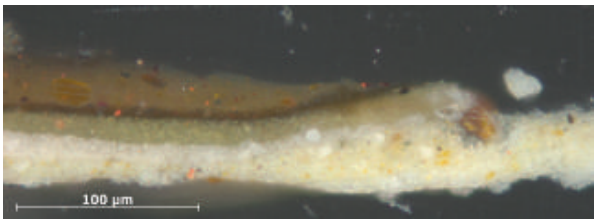


FIG. 131 *Mrs Elizabeth Carnac*, paint cross-section from foreground.

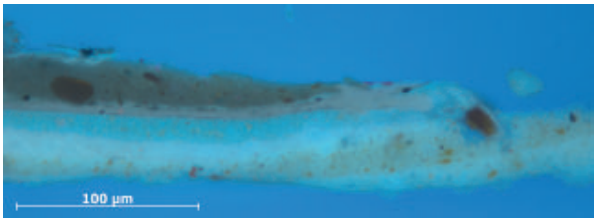


FIG. 132 *Mrs Elizabeth Carnac*, FIG. 131 photographed under ultraviolet illumination.

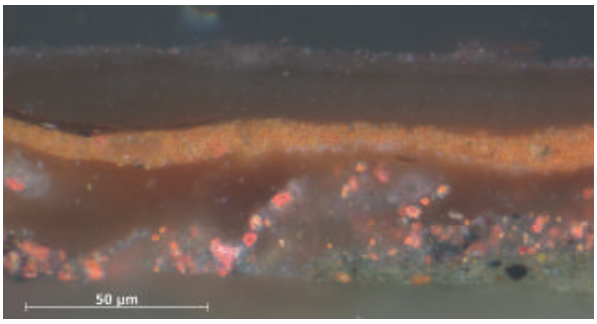


FIG. 133 *Mrs Elizabeth Carnac*, paint cross-section from foliage.

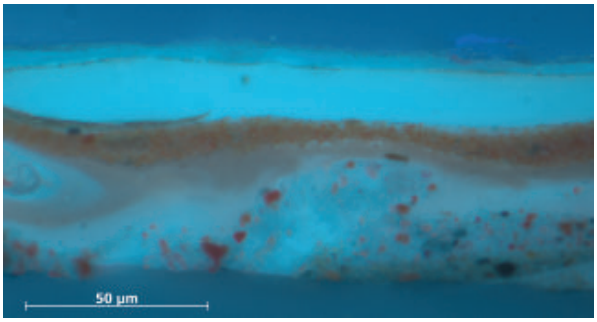


FIG. 134 *Mrs Elizabeth Carnac*, FIG. 133 photographed under ultraviolet illumination.

CAT. 10

Saint John the Baptist in the Wilderness

The Wallace Collection (P48)
After 1776
127.8 × 102.4 cm (half-length)
Original canvas probably plain weave (removed during transfer).

This is one of several versions of the Child Baptist painted by Reynolds. The prime version is generally considered to be the painting that was destroyed in the fire at Belvoir Castle in 1816. It was probably this painting that was exhibited in the Royal Academy in 1776 and was engraved by Joseph Grozer in 1799 (FIG. 138). Henry Bone also produced an enamel copy in miniature. There is another version in the Minneapolis Institute of Arts (68.18) that is unfinished, and several versions survive in private collections. On Reynolds's death the Wallace Collection painting was still in the artist's studio and was sold on the third day of his sale of pictures (FIG. 135).[1]

Sittings for a 'Child St John' are recorded in Reynolds's 'Sitter Book' in December 1770. There is also a 'Technical Note' in his ledger from around the same time: 'The nicean [*sic*] Nymph with Baccus *principiato* / *con cera solo finito con cera & capivi* / *per causa* it crak'd / Do. St. John'.[2] This appears to indicate that, like a painting of the Nicene Nymph and Bacchus, a version of the Saint John was painted in wax but finished with wax and copaiba balsam because it had cracked.[3]

The condition of the Wallace Collection painting is very poor, it having had a long history of change and vulnerability. The painting was lined and cleaned by Horace Buttery in 1879, but in 1911 it was in a sufficiently unstable condition for the painting to require

FIG. 135 Joshua Reynolds, *Saint John the Baptist in the Wilderness*, after 1776. Canvas, 127.8 × 102.4 cm. The Wallace Collection, Inv. P48.

FIG. 136 *Saint John the Baptist in the Wilderness*, X-radiograph.

FIG. 137 *Saint John the Baptist in the Wilderness*, infrared reflectogram.

FIG. 138 Joseph Grozer, after Joshua Reynolds, *Saint John*, 1799. Mezzotint, 45.6 × 35.5 cm. British Museum, Inv. 1866,1114.567.

further treatment and for transfer of the paint layer to another canvas to be considered.[4] The painting was given to the restorers Mr Haines and Sons, but in a note in the Wallace Collection Trustees Minutes from January 1913 it was recorded that the painting was 'removed by Messrs. Morell and Sons from the National Gallery to their workshop to accelerate the process of transferring the picture to a new canvas'.[5] This treatment appears to have caused further damage and did not overcome the instability of the paint layer as further consolidation treatments were recorded in 1974 and 1982, although there is currently no active flaking.[6]

By comparing the X-ray image (FIG. 136) and infrared reflectogram (FIG. 137) the full extent of the damage can be assessed. There are losses, large and small, scattered across the entire surface. It also appears that much of the ground layer was removed during the process of transfer and filling material was probably added to level the reverse of the paint surface before the paint layer was affixed to a new canvas. As a result the X-ray image and any paint analysis must be interpreted with due caution.[7]

As most of the ground layer appears to have been removed, it does not register in the X-ray image. It is therefore not possible confidently to identify the canvas weave although there is some indication that it may

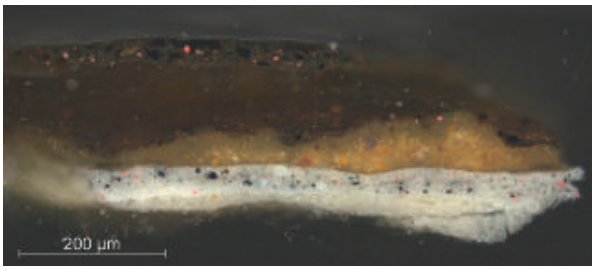


FIG. 139 *Saint John the Baptist in the Wilderness*, paint cross-section from background, right edge.

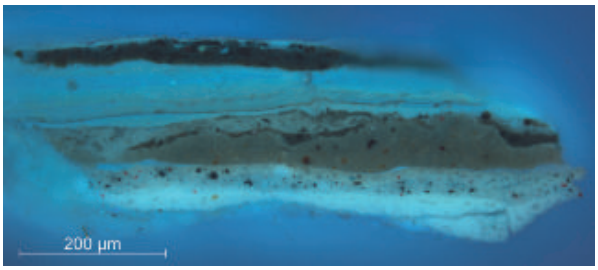


FIG. 140 *Saint John the Baptist in the Wilderness*, FIG. 139 photographed under ultraviolet illumination.

have been plain weave; at this date, either a plain or twill-weave canvas would be expected. It is unlikely that the image has been reduced in size as it still conforms to the dimensions of a standard half-length. A single cross-section taken from the right edge of the picture appears to contain a trace of the original ground. The lower layer comprises calcium carbonate and lead white, and a trace of a yellow earth pigment is visible. Comparison with the ground layers observed on the other pictures examined in this survey points to this being the ground layer (FIG. 139).

In spite of the poor condition of the painting, the X-ray image does reveal some genuine compositional changes. The background on the right-hand side of the canvas, between the large tree trunk and the edge of the painting, originally depicted a distant landscape view that was later covered with foliage and an additional tree trunk. The sky was painted to the level of the sheep's head and a reserve was left for the distant hills. This composition would have borne a closer resemblance to the engraving made in 1799 (FIG. 138). The cross-section illustrated in FIG. 139 appears to show a pale grey layer, which may originally have been the sky beneath the yellow and brown paint of the foliage. There is also a very faint indication visible in the UV-light image of the sample (FIG. 140) of a thin varnish, or intermediate layer, separating these two stages of the painting. The dark paint at the surface of the sample, above the extremely thick build up of varnishes, is later restoration.

The cross that Saint John holds was also adjusted. Although it now appears very similar to the cross depicted in the engraving, the X-ray image reveals that its top was originally in a higher position and the scroll was shown as winding around the shaft in the opposite direction (FIG. 141). This first placing of the cross and scroll is comparable to that in another version of the painting from a private collection.[8] In the same manner as the Wallace Collection painting, this latter version also has the light in the upper left corner of the composition emerging from an opening in the background landscape, rather than emanating directly from the corner of the painting, as it does in the engraving and miniature.

A cross-section of paint from the highlighted side of Saint John's torso shows that the flesh paint is based on lead white with the addition of a substantial amount of vermilion, some black and a little yellow (FIG. 142). However, a sample from Saint John's leg seems to indicate that some fading has taken place, since the upper part of the flesh paint is noticeably paler than the paint lower down in the layer indicating, perhaps, the use of a lake pigment (FIG. 143).

The extent of the restoration on the surface of the painting and the number of interventions to stabilise flaking paint over the years has made it extremely difficult to carry out any reliable analysis of the original binding medium. It was not possible to obtain samples

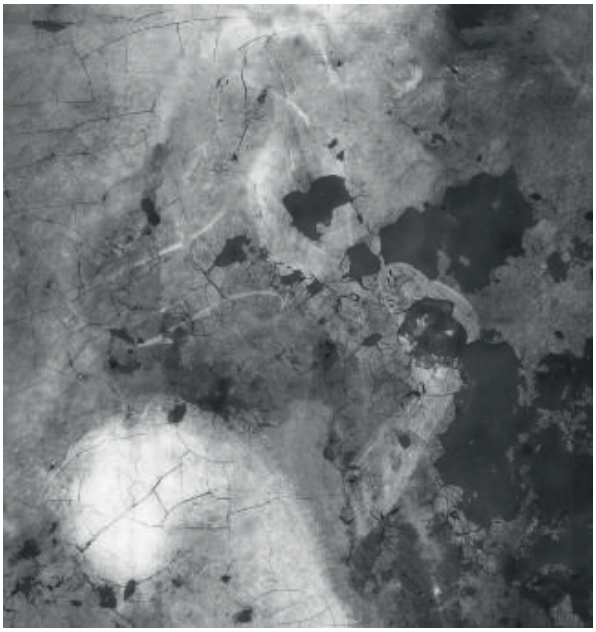


FIG. 141 *Saint John the Baptist in the Wilderness*, detail of X-radiograph.

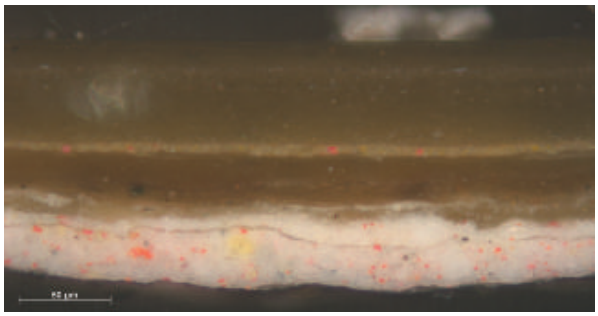


FIG. 142 *Saint John the Baptist in the Wilderness*, paint cross-section from flesh paint of the torso.

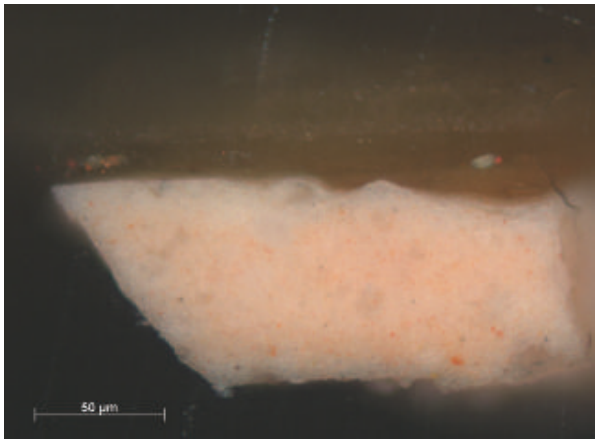


FIG. 143 *Saint John the Baptist in the Wilderness*, paint cross-section from flesh paint of the leg.

of original paint that were entirely free from contamination with later surface coatings or materials associated with restoration treatments. However, two samples that contained original paint were analysed: one from the flesh paint of Saint John's lower leg, and a second from the orange-coloured foliage at the right-hand side of the background. The paint medium appears to be based on heat-bodied oil in each case. Although the type of oil used for the foliage could not be determined, the results suggested a heat-bodied walnut oil medium for the flesh paint.[9] In addition, both samples contained small amounts of the labdane ester, methyl eperuate, with traces of dimethyl pinifolate. This indicated that the paint samples contained a proportion of resin from the Leguminosae family, probably a type of copaiba balsam.[10] The absence of these components in any of the samples of varnish, and comparison with the medium analysis results of other paintings in this study where the same compounds have been identified,[11] suggest strongly that the copaiba balsam is a component of the original paint itself. Some fir balsam was also detected, although this could be associated with an older surface coating or perhaps a glaze layer over the surface, and seems less likely to be connected with the medium of the main paint layers.[12] A little beeswax was also observed in both paint samples. While it is possible that this could be connected to the paint itself, beeswax may also be related to the consolidation of flaking paint or the application of a surface polishing treatment.

Although it is difficult to draw incontestable conclusions based on the limited amount of analysis carried out, these results are extremely interesting in the light of the 'Technical Note' in Reynolds's ledgers that suggests that both wax and copaiba balsam were used to paint at least one version of the infant John the Baptist. The inclusion of these materials may also have contributed to the history of flaking. The unstable condition, as well as the pentimenti and the medium analyses, together seem to indicate that the Wallace Collection painting may be a variant produced by Reynolds himself, rather than simply a studio copy of an existing design.

CAT. 11

Mrs Mary Nesbitt

The Wallace Collection (P43)
1781
76.5 × 63.2 cm (bust or three-quarter-length)
Thread count of canvas: 20 vertical, 21 horizontal threads per cm^2 (twill weave)

Mrs Mary Nesbitt was a courtesan before she married the banker Alexander Nesbitt in 1768. She later became the acknowledged mistress of Augustus Hervey, 3rd Earl of Bristol, with whom she lived after her husband's death in 1772.[1] Reynolds painted two portraits of Mrs Nesbitt: the Wallace Collection picture (FIG. 144) and a half-length portrait as Circe, now in the Smith College Museum of Art, Northampton, MA (SC 1958:4). It is probable that both portraits relate to five sittings recorded in April and May 1781[2] and most likely were commissioned after Mrs Nesbitt won a lawsuit that contested Lord Bristol's will.[3]

The composition of the Wallace Collection picture appears to derive from Reynolds's portrait of Mrs Charles James Fox (FIG. 145).[4] Her pose, with a raised arm held against the chest, is similar to that used for the portrait of Mrs Nesbitt, although Mrs Nesbitt's head has been turned to afford a three-quarters view of her face and she is framed by a painted oval.

The X-ray image of *Mrs Mary Nesbitt* indicates that the composition was originally closer to that of Mrs Fox. The sitter's left hand was shown and the sleeve of the raised forearm, originally painted with a frilled cuff, extended further to the left. The line of the proper right shoulder was higher and a brushstroke of thick paint marking this first position can be seen in the X-ray image (FIG. 146) and also as a raised contour in raking light (FIG. 148).[5] The changes seem to have been made after Reynolds decided to include a dove – a traditional symbol of innocence – in the composition.[6] No reserve was left and the bird was painted over the blue sky, which can be seen showing through the paint of the shadows of the wing. To accommodate this addition the sitter's shoulder was lowered and her hand was covered by the body of the bird.

The oval format of the painting was always intended, the X-ray image showing that the sky does not continue beneath the paint of the spandrels. The infrared reflect-

FIG. 144 Joshua Reynolds, *Mrs Mary Nesbitt*, 1781. Canvas, 76.5 × 63.2 cm. The Wallace Collection, Inv. P43.

FIG. 145 Joshua Reynolds, *Portrait of Mrs Charles James Fox*, about 1775–80. Oil on canvas, 76.2 × 63.5 cm. Indianapolis Museum of Art, Inv. C10064.

FIG. 146 *Mrs Mary Nesbitt*, X-radiograph.

FIG. 147 *Mrs Mary Nesbitt*, infrared reflectogram.

ogram (FIG. 147) shows a roughly executed *trompe-l'oeil* oval surround, not visible in the final image. The brushstrokes are broad and it is likely that the oval was never fully worked up before the spandrels were painted with the more uniform, brown colour now visible.[7]

A cross-section sample taken from the brown oval near the lower edge (FIG. 149) indicates that the canvas was prepared with a single layer of off-white ground containing both lead white and calcium carbonate. Some fine particles of a red earth pigment are included,[8] along with a little finely divided, blue pigment, probably Prussian blue.[9] The paint of the oval was built up in several layers. The lowest layer contains large particles of bone black with a little lead white and is presumably the paint that registers strongly in the infrared reflectogram and relates to the early design. The subsequent red-brown paint layers contain earth pigments and black, probably charcoal, with a little vermilion in the upper of the two. These two phases of painting are separated by a fluorescent interlayer visible under ultraviolet light (FIG. 150). A further layer showing similar fluorescence is present above the red-brown paint but below the later varnish layers, which fluoresce with a stronger, blue cast. Medium analysis of the dark paint confirmed the presence of heat-bodied linseed

FIG. 148 *Mrs Mary Nesbitt*, detail taken in raking light.

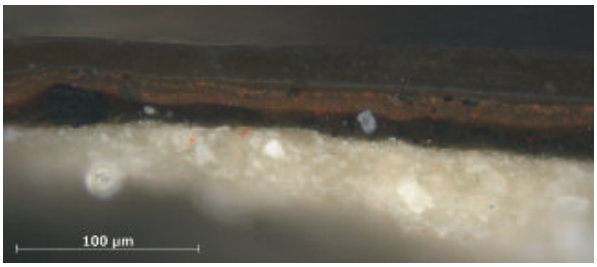


FIG. 149 *Mrs Mary Nesbitt*, paint cross-section from the oval.

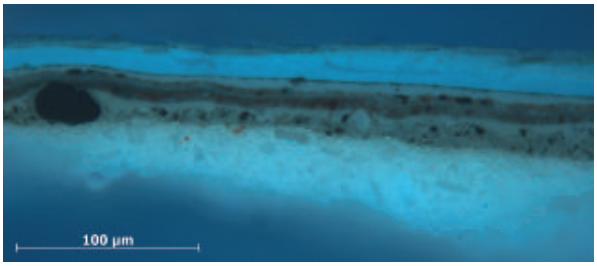


FIG. 150 *Mrs Mary Nesbitt*, FIG. 149 photographed under ultraviolet illumination.

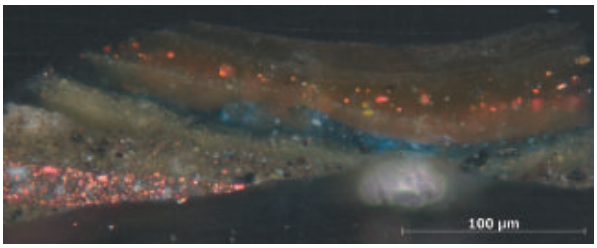


FIG. 151 *Mrs Mary Nesbitt*, paint cross-section from the sky.

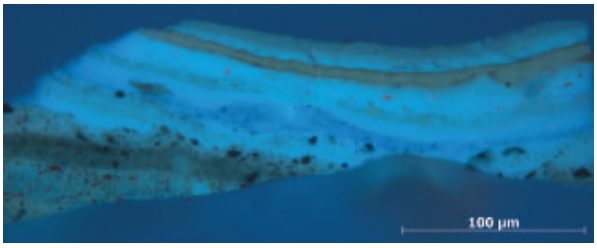


FIG. 152 *Mrs Mary Nesbitt*, FIG. 151 photographed under ultraviolet illumination.

oil mixed with significant quantities of pine resin.[10]

The paint medium in the main part of the image, inside the oval, is also based on heat-bodied linseed oil, identified in samples from the flesh paint, the grey paint of the drapery and the brown underlayers of the background visible where these have protruded through cracks in the overlying blue sky paint. In each of these samples small amounts of the labdane esters methyl eperuate and dimethyl pinifolate were identified, probably indicating that a type of copaiba balsam resin was also used.[11] Some pine resin was detected, which may be an adulterant in the copaiba balsam, or could be a separate additive. These resins may form part of the paint medium itself, but they could be associated with final glaze layers or perhaps with varnish interlayers. Evidence from cross-sections, as well as microscopic examination of the paint surface, revealed that the layer structure is complex and extensive layers of glazing have been used.

The blue sky of the background, for example, has been finished with a glaze containing red and yellow particles, seen under magnification as a thin, discontinuous brown layer (FIG. 153). In cross-section this appears as two thin glazes, the lower layer containing rather more yellow earth and the upper layer containing particles of vermilion (FIG. 151).[12] Both layers are notably medium-rich and are separated from the underlying paint by an unpigmented layer, which is similarly highly fluorescent under ultraviolet light (FIG. 152). The Prussian blue paint had become intermixed with

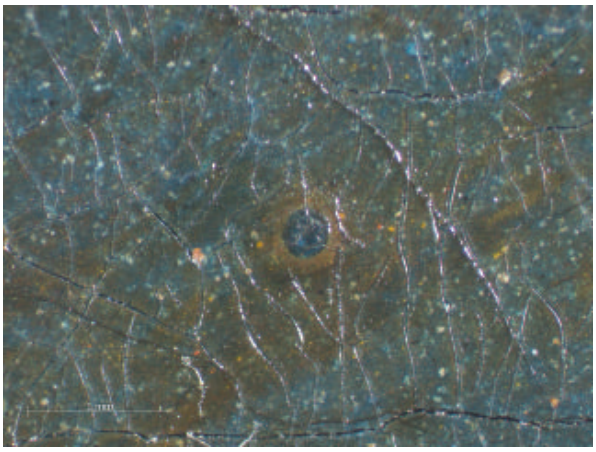


FIG. 153 *Mrs Mary Nesbitt*, photomicrograph of the sky.

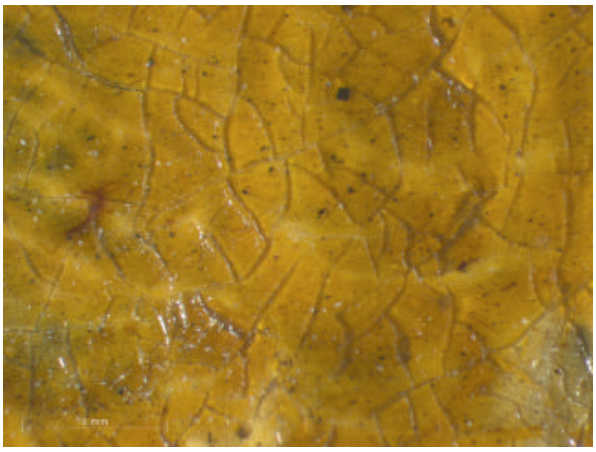


FIG. 154 *Mrs Mary Nesbitt*, photomicrograph of the gold decoration on the sitter's shoulder.

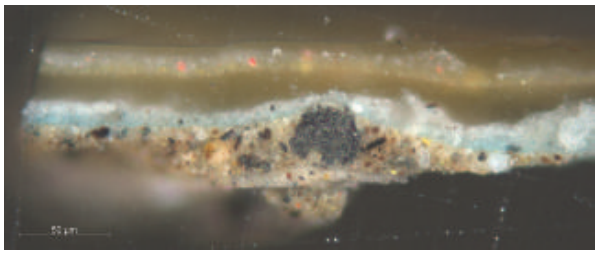


FIG. 155 *Mrs Mary Nesbitt*, paint cross-section from the edge of the sleeve where it overlaps the background. The cream coloured paint contains vermilion, yellow earth and lead white and is applied above a thick varnish layer. The blue background is painted with Prussian blue, lead white and a little bone black over several brown underlayers, containing mixtures of lead white with earth pigments, carbon black and a little orpiment

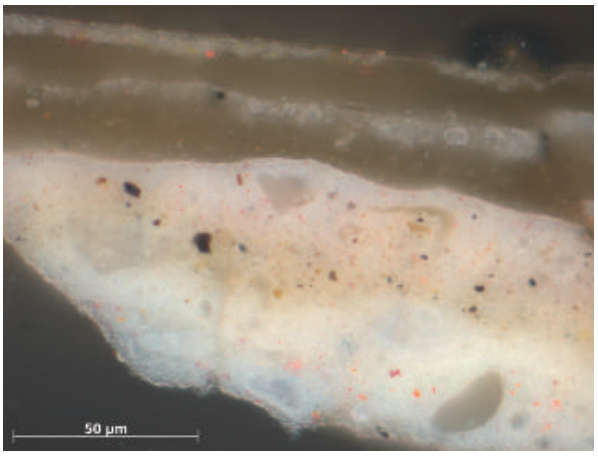


FIG. 156 *Mrs Mary Nesbitt*, paint cross-section from flesh paint on the sitter's back.

this layer and must have still been wet when it was applied. Traces of the same resin components, once more suggestive of copaiba balsam, were detected in a sample of this brown glaze, in addition to some heat-bodied oil and small amounts of pine resin.[13] There is also evidence of glazing over the yellow decoration on the drapery where a very medium-rich layer containing particles of black pigment has been applied (FIG. 154).

The final scumble of cream paint applied to Mrs Nesbitt's sleeve, where it overlaps the blue background, has also been applied over a highly ultraviolet-fluorescent varnish interlayer (FIG. 155). In addition, samples from the flesh paint also show that this was reworked over a varnish layer (FIG. 156). There may be some later retouching present at the upper surface of this sample, but the thin scumble containing lead white, some black and a little vermilion, applied above the first varnish layer, is likely to be original. In a separate sample of flesh, a little orpiment was identified in a similar scumbled layer applied over an intermediate varnish.[14]

The main paint layers used to build up the flesh tones are composed of lead white with additions of both vermilion and red earth. Particles of bone black were also identified and there may be a little Prussian blue.[15] A translucent oval particle in the pale underlayer visible in cross-section (FIG. 156) was identified as starch, which seems to be present as an extender in the white paint.[16]

The flesh paint suffers from particularly pronounced wrinkling, which has produced a network of raised ridges of paint as well as wider, ductile drying cracks that are prominent in the face (FIG. 157).[17] In the X-ray image the most pronounced cracks appear as dark lines where the edges of the paint have contracted away from one another (FIG. 146). These cracks appear particularly disturbing as they are associated with many of the features of the face and tend to follow the contours of the forms.[18] The range of defects may be the result of Reynolds reworking the flesh paint over a layer of varnish and could also relate to the inclusion of the copaiba balsam type resin. However, it is not clear why the flesh particularly seems to have suffered more than other areas of the painting, since medium-rich pigmented layers and ultraviolet-fluorescent interlayers are also present elsewhere.[19]

The examination of this painting (through microscopy and samples) confirms that Reynolds could be inclined to use glazes extensively. The clear evidence of paint layers applied on top of intermediate varnish layers reinforces the caution required when interpreting the layer structure of his paintings and the great care needed when considering varnish removal.

FIG. 157 *Mrs Mary Nesbitt*, photomicrograph of flesh paint on the sitter's face. A wide crack with restoration is visible in the centre of the image.

CAT. 12a
Lady Elizabeth Seymour-Conway

The Wallace Collection (P31)
1781–4
61.5 × 47.2 cm (head)
Thread count of canvas: 18 vertical, 21 horizontal threads per cm^2 (twill weave)

CAT. 12b
Frances, Countess of Lincoln

The Wallace Collection (P33)
1781–4
62 × 47 cm (head)
Thread count of canvas: 18 vertical, 21 horizontal threads per cm^2 (twill weave)

The portraits of the sisters Lady Elizabeth Seymour-Conway (FIG. 158) and Frances, Countess of Lincoln (FIG. 159) were commissioned by their father the 1st Marquess of Hertford, who paid for them sometime between September 1784 and November 1785.[1] Both paintings were begun in 1781 and the 'Sitter Books' suggest that Reynolds started with the painting of Frances who had five appointments in May of that year. Frances also had seven sittings in June 1781, each at 11am, of which four were followed, at midday, by sittings for Elizabeth. No other sittings are recorded for Elizabeth, but Frances had an additional appointment in March 1782[2] and two further appointments in April 1784.[3] The paintings were evidently conceived as a pair, so that when placed side by side the sisters face one another.

Both paintings were executed on twill-weave canvas prepared with a single layer of white ground containing calcium carbonate and lead white.[4] A few small particles of blue pigment, probably Prussian blue, were observed in some samples that contain the ground from the

FIG. 158 Joshua Reynolds, *Lady Elizabeth Seymour-Conway*, 1781–4. Canvas, 61.5 × 47.2 cm. The Wallace Collection, Inv. P31.

FIG. 159 Joshua Reynolds, *Frances, Countess of Lincoln*, 1781–4. Canvas, 62 × 47 cm. The Wallace Collection, Inv. P33.

FIG. 160 *Lady Elizabeth Seymour-Conway*, X-radiograph.

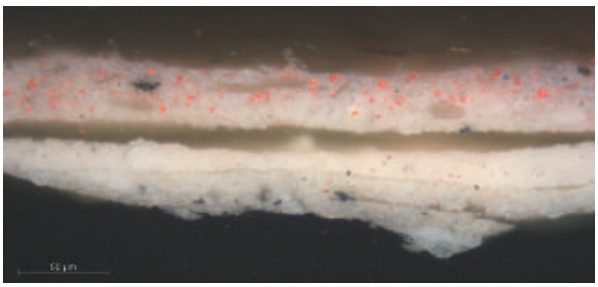


FIG. 161 *Lady Elizabeth Seymour-Conway*, paint cross-section from flower on sleeve.

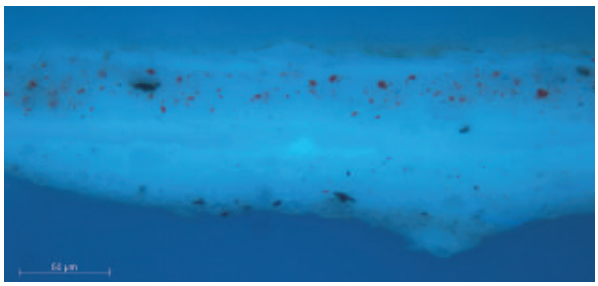


FIG. 162 *Lady Elizabeth Seymour-Conway*, FIG. 161 photographed under ultraviolet illumination.

Countess of Lincoln.[5] Medium analysis of a sample of this ground layer indicated heat-bodied linseed oil binding medium.[6]

The mastery of the paint handling and the confidence with which the brushstrokes are applied highlight Reynolds's mature style at this date, and it seems that these small pictures must have been executed entirely by his hand. However, even in these small portraits Reynolds appears to have made changes as the work progressed. The costume of Lady Seymour-Conway may at first have been similar to those worn by the sitters in *The Ladies Waldegrave* (see FIG. 16, p. 16). The X-ray image (FIG. 160) reveals a similar scooped neckline, the frilled fichu having been added over the bodice at a later stage.[7] A cross-section taken from the sleeve showed that there is a translucent intermediate layer, probably a layer of oil-resin varnish,[8] between the pink paint of the small decorative flowers and the underlying white paint of the sleeve (FIGS 161, 162), so these too may have been added as a later embellishment (FIG. 163).[9]

When laying out the composition of the *Countess of Lincoln*, Reynolds sketched in the proper left arm, a diagonal brushstroke in the X-ray image seeming to indicate the forearm (FIG. 164). However, in the finished painting this area presents only a suggestion of form, laid in with sketchy brushstrokes and dark glazes. Thin layers of black and Prussian blue paint have been applied over lighter underlayers and the paint has been blended and 'feathered' wet-in-wet on the surface (FIG. 165). Final touches of a fluid, lighter-coloured paint were used to create the modelling and give a stronger sense of form.

The X-ray image shows significant alterations to the hairstyle of *Lady Seymour-Conway* (FIG. 160). The original appearance was smoother and swept up to the

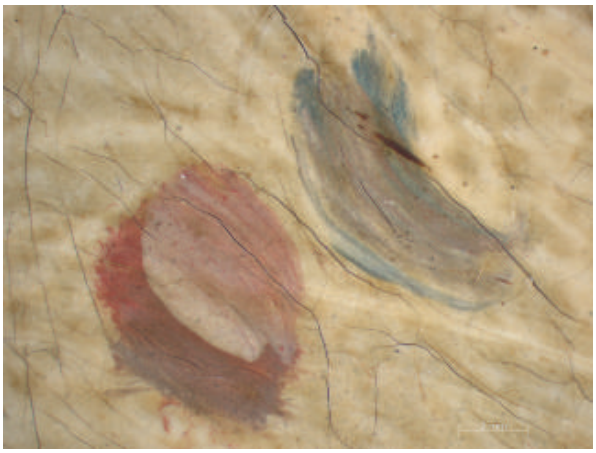


FIG. 163 *Lady Elizabeth Seymour-Conway*, photomicrograph of flower on sleeve.

FIG. 164 *Frances, Countess of Lincoln*, X-radiograph.

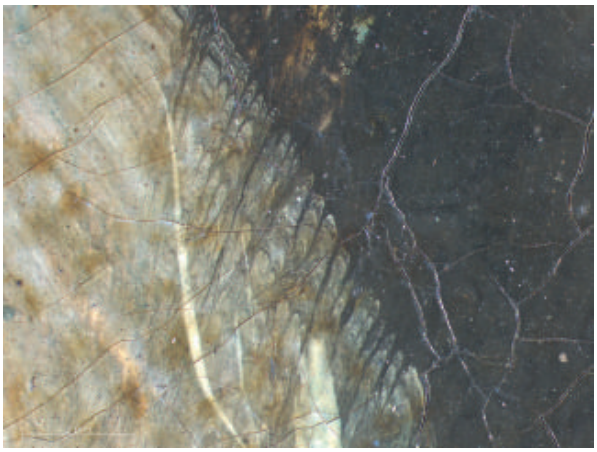


FIG. 165 *Frances, Countess of Lincoln*, photomicrograph of drapery.

top of the head so that it would have been comparable to that of Lady Charlotte in *The Ladies Waldegrave*. The curls at the sitter's neck were placed higher and the ear was more exposed. The hairstyle of the *Countess of Lincoln* has also been adjusted. However, the smoothed style seen in *Lady Seymour-Conway* is not as evident and perhaps the painting of the hair was not taken to this same degree of completion before the final changes were made (FIG. 164). The voluminous hairstyles now visible in both the finished portraits was built up with a mass of brushstrokes in different shades of grey. It is likely that Reynolds adjusted both portraits to reflect the more frizzed style that had become the established fashion by the time of the Countess of Lincoln's final sittings in 1784.

The paint medium of both pictures is based on heat-bodied linseed oil. In *Lady Seymour-Conway* this was identified in three paint samples: in the blue drapery, and in both the upper blue paint and the darker grey underlayer of the sky. In the *Countess of Lincoln*, heat-bodied linseed oil was identified in the blue and grey paint of the background and also in the lighter grey paint of her sleeve.[10]

There are minor differences in the additional materials present in the paint media of the two pictures, in spite of the fact that the portraits must have been worked on concurrently, at least during the sittings in June 1781. Perhaps this reflects the difference in the number of sittings recorded for each sister and the fact that Reynolds continued to work on the pictures, making adjustments over the next few years.[11] Some resin was identified in addition to the oil medium in both paintings. In *Lady Seymour-Conway* this was characterised by GC–MS analysis as mastic and traces of pine resin.[12] Examination of cross-sections – in particular the samples from the brooding sky of the background – shows that the paint has been built up in multiple layers; there is a fluorescent interlayer present between the final paint application and the underlayers. In a sample from the left edge, the translucent interlayer seems to erupt through a crack in the upper Prussian blue-containing paint and at the right end of the sample itself the underlying brown paint layer has flowed up to the surface (FIGS 166, 167).[13] ATR–FTIR analysis suggested that the highly fluorescent interlayer contains a resinous component, correlating with the results from GC–MS analysis.[14] Examination of the paint surface under the stereomicroscope also revealed evidence for the movement of undried lower layers in parts of the background, since material has emerged onto the surface through brittle cracks in the upper paint layer. In addition to resins, a little beeswax was also identified in the dark blue paint of the sitter's sash and in the grey underpaint of the background.[15] This does not seem to be related to a surface coating, or recent conservation treatment, and may be either an additional component in the type of interlayer mentioned above or perhaps a constituent of the paint medium itself.

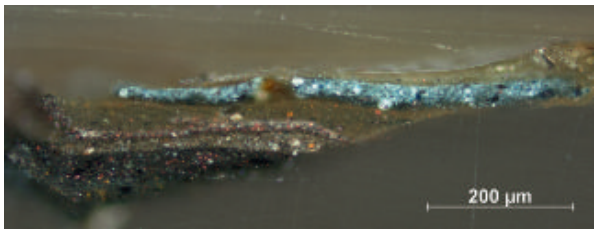


FIG. 166 *Lady Elizabeth Seymour-Conway*, paint cross-section from sky.

FIG. 167 *Lady Elizabeth Seymour-Conway*, FIG. 166 photographed under ultraviolet illumination.

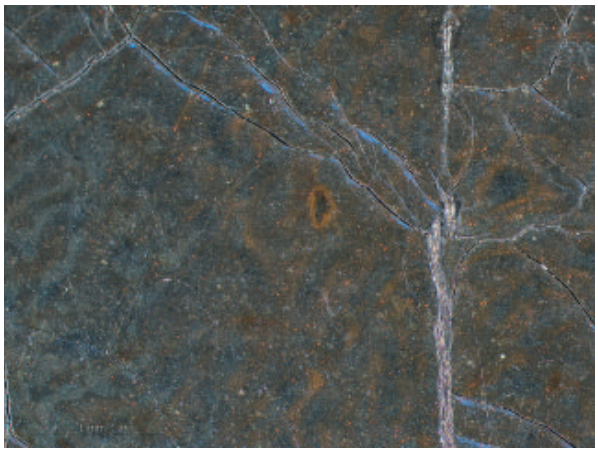


FIG. 168 *Frances, Countess of Lincoln*, photomicrograph of sky.

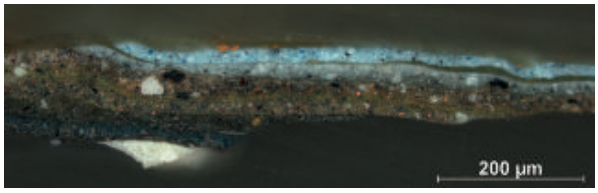


FIG. 169 *Frances, Countess of Lincoln*, paint cross-section from sky.

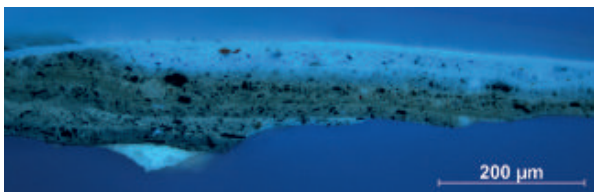


FIG. 170 *Frances, Countess of Lincoln*, FIG. 169 photographed under ultraviolet illumination.

In the *Countess of Lincoln*, a little mastic and pine resin were detected in the paint samples, but no trace of beeswax was found. However, samples from Frances's sleeve, and from the blue sky, also contained components characteristic of a Leguminosae resin, perhaps copaiba balsam (peaks for methyl eperuate and dimethyl pinifolate were observed in the chromatograms).[16] Once more, the dark sky here is built up in several layers, with a similar deployment of brown and grey underpaints. A cross-section from the left edge shows that the upper blue paint in this lighter passage is separated from the underlying layers by a thin translucent interlayer, as elsewhere (FIG. 169). This is harder to distinguish in the photomicrograph taken in ultraviolet light, since the surrounding paint is itself rather fluorescent in character (FIG. 170). In addition there is a thin glaze at the surface that is sparsely pigmented, consisting of a few scattered particles of red earth suspended in a fluorescent medium.[17] A layer of this composition is present over much of the sky, but it varies in thickness and density across the surface. This feature is visible in a photomicrograph from a darker part of the sky (FIG. 168). In places the pigment particles have clumped together and the layer is more opaque, while in some areas it seems no more than a sprinkling of red pigment. This is most reminiscent of the glaze layers present on the background of *Mrs Mary Nesbitt* (CAT. 11) in which the blue sky was constructed in a similar fashion. It may be that copaiba balsam detected by GC–MS analysis was used for this final thin glaze paint, although in this case it is difficult to establish the exact distribution of the different materials within the paint layer structure.

The paint layers in the background of the *Countess of Lincoln* have also apparently remained mobile over a long period of time: under microscopic examination the lower layers of paint are visible as emerging from cracks, a phenomenon seen also in *Lady Seymour-Conway*. The sky in each picture has developed a distinctive network of cracks, with older drying cracks intersected by more recent brittle cracking, presumably as a result of the complex layering Reynolds employed.

The drying problems are not so extensive in the draperies and figures of the sitters themselves, which, although still built up in several layers, are in general constructed in a more straightforward fashion. A sample from Lady Seymour-Conway's blue sash shows that the purple-tinged blue paint has been applied directly over a brown underlayer (FIG. 171). It contains very large particles of a red lake pigment mixed with Prussian blue

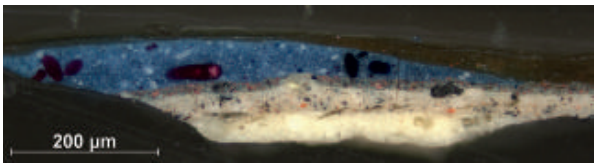


FIG. 171 *Lady Elizabeth Seymour-Conway*, paint cross-section from blue sash.

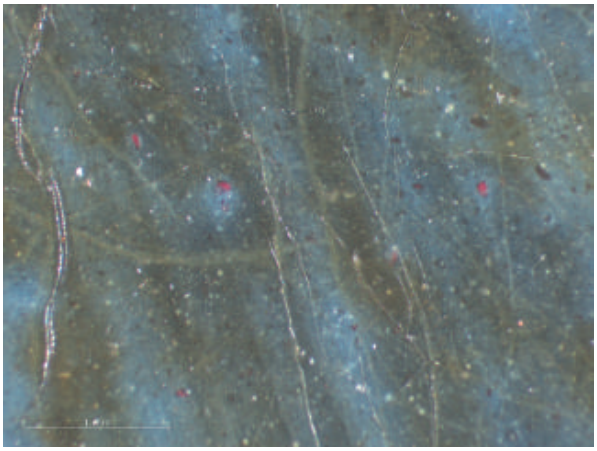


FIG. 172 *Lady Elizabeth Seymour-Conway*, photomicrograph of blue sash.

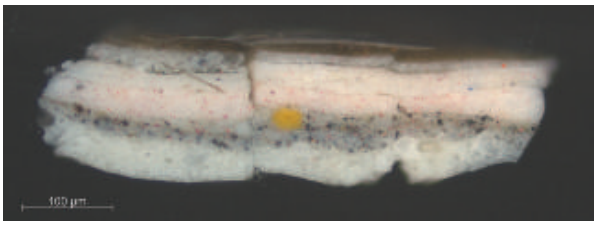


FIG. 173 *Frances, Countess of Lincoln*, paint cross-section from sleeve.

and lead white. Unfortunately, insufficient red lake was present in order to identify the dyestuff, but it is surely based on cochineal in this case.[18] The particles are so large that they are clearly distinguishable at the paint surface (FIG. 172). A cross-section from the Countess of Lincoln's sleeve (FIG. 173) shows a thick build-up of paint layers, and although there are no translucent intermediate layers, the drapery has obviously been reworked. The pink paint applied over an initial layer of grey contains lead white and fine particles of a strongly coloured iron oxide red.

These two small portraits, commissioned as a pair, show clear evidence of Reynolds varying his materials as he painted, while also making changes to the design in order to keep up with the contemporary styles that would satisfy his sitters.

CAT. 13
Colonel Tarleton

The National Gallery (NG 5985)
1782
239 × 145.5 cm (whole-length)
Thread count of canvas: 20 vertical, 18 horizontal threads per cm^2 (twill weave)

Reynolds painted this full-length portrait of Banastre Tarleton (FIG. 174), aged 27, in 1782, on the sitter's return from service in the American War of Independence, where, having volunteered, he had rapidly risen in rank so that by 1778 he was commander of an irregular cavalry troop known as the British Legion.[1] Ten appointments with Reynolds are recorded between January and mid-April 1782 and the finished picture was shown as 'Portrait as an Officer' at the Royal Academy later that year.[2] The somewhat chaotic technique, particularly in the setting for its principal figure, shows evidence of rapid execution for this large picture, and there are an unusual number of modifications – even by Reynolds's standards – which were made during the course of painting.

The painting was bequeathed to the National Gallery in 1951. It was cleaned and restored in 1975, at which time the technique was investigated by cross-sectional analysis and the paint binding medium analysed by gas-chromatography (GC). The results of the latter were reported in 1977 in volume 1 of the *Technical Bulletin*, the first instrumental analyses of Reynolds's paint medium to be published.[3] Several existing unmounted pigment samples were analysed by emission spectrography in 1977, using the then new technique of laser microspectral analysis (LMA), which demonstrated the use of orpiment in the orange and yellow-brown flag draped over the cannon at the left.[4] Further examination of samples followed as a contribution to Judy Egerton's *British Paintings* National Gallery Catalogue, which contains a 'technical note' summarising what was then known of Reynolds's method of painting for the picture.[5] The summary material was reviewed in 2009, and limited further paint medium analyses undertaken, this time with the more advanced technique of GC–MS, to ascertain whether original resinous and/or bituminous materials may have been incorporated in the paint, and to make comparison with results of analyses obtained for *Lord Heathfield* (CAT. 15), published in 2010 (see also p. 91).[6] A second check for bituminous content in samples was made in 2013, with negative results.[7]

The twill-weave canvas is a standard whole-length size; it bears a single white ground composed of lead white and calcium carbonate. The paint is applied everywhere so thickly that any impression of the canvas support is lacking, except for the shadowed side of the sitter's head, around his proper left ear and the outline of his proper right shoulder, where the canvas texture can be seen in thinly worked paint.

A new full X-ray mosaic of the painting (FIG. 175) was made in 2013, and this has proved most helpful in detecting some of the many changes wrought by Reynolds during the course of devising his dynamic scene. Some observations can be listed as follows: the pose of the sitter, unusually for the whole composition,

FIG. 174 Joshua Reynolds, *Colonel Tarleton*, 1782. Canvas, 239 × 145.5 cm. The National Gallery, NG 5985.

has remained fairly static; initially there was only a single horse, a second horse and second figure were added; the mouth of the cannon was originally wider and set further away from the sitter's lower back; the sword, originally hanging from the hip, was later moved to be held in the hand; the end of the sword, beyond the sitter's proper right leg, was more clearly visible; a highlight on the cuff was painted first then covered by the hilt of the sword (for which there is no reserve as a result); a reserve for the original position of the sword blade is visible; the lance with the orange-red flag/drapery on the right side, foreground, is a late addition; the feathers on the helmet originally pointed upwards and were spread out; Tarleton's gaze originally may have been more directed to the viewer; a dark reserve around the helmet has been left for the bearskin at the front of Tarleton's headgear, perhaps closer to the pattern in the engraving published in 1782.[8]

It is not unexpected from the above that cross-sections show a complex layer structure, and these are particularly multilayered in reworked areas of the cannon, flags, horses and general setting along the left side of the picture (FIG. 176). The paint structure of the cannon and its carriage mounting provide clear cases in point; similar reworking is found to the right (FIG. 177). These are also the parts of the picture where the most disruptive and noticeable drying cracks are evident, and result, presumably, from the unusual complexity in layering, the mechanical and specific drying properties of unpigmented interlayers, and the possible incorporation into paint of poor-drying materials or combinations of materials. The assumption of Reynolds's use of bitumen (asphaltum) in the darks, as an explanation for the paint defects, has not been borne out by any of the instrumental analyses carried out over a period, including the most recent reconfirmation of this result in 2013.

It is easily seen *Colonel Tarleton* that Venetian painting and Venetian colour had strong influences

FIG. 175 *Colonel Tarleton*, X-radiograph.

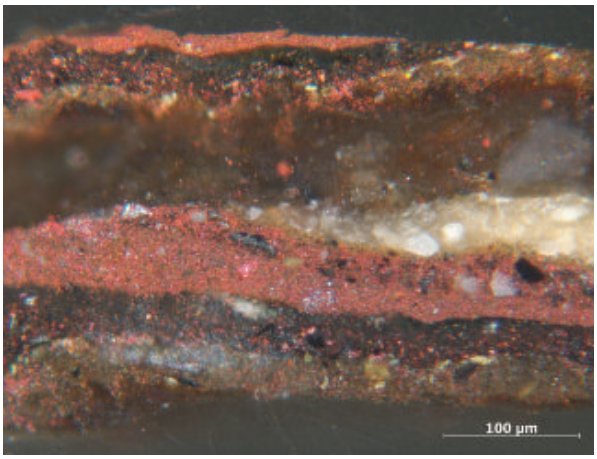


FIG. 176 *Colonel Tarleton*, paint cross-section from the background at the left edge.

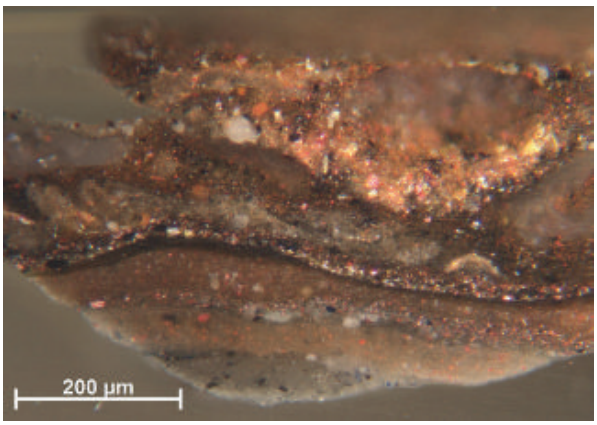


FIG. 177 *Colonel Tarleton*, paint cross-section from the smoke-filled sky near the horizon at the right edge.

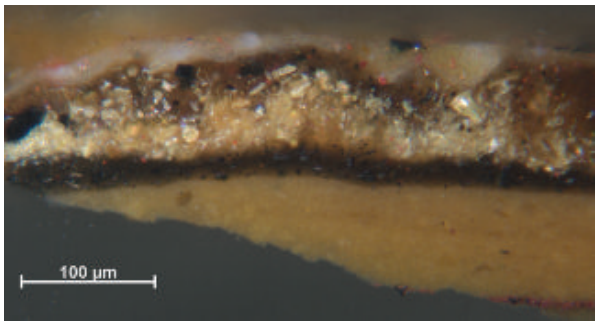


FIG. 178 *Colonel Tarleton*, paint cross-section from the yellow-brown drapery in the lower left corner, containing orpiment and other yellow pigments.

on Reynolds. Egerton even points out a similar pose to Tarleton's in a figure from Tintoretto.[9] Reynolds's use of orpiment, which is a characteristic of Venetian sixteenth-century painting, and dark orange and orange-brown glazes, incorporating various pigments of differing translucencies, emulate successfully the fiery warmth of the paintings he admired, but it should be borne in mind that Reynolds was most probably attempting to imagine the appearance of the underlying paint, and perhaps even compensate for the dark yellow-brown varnish layers on paintings only available to him in relatively low light conditions. Notable here are some similarities in technique with the passages of drapery in *Lady Cockburn and her Three Eldest Sons* (CAT. 7), which contains orpiment and, more unusually, genuine bitumen in the dark translucent glazes of a background curtain. Orpiment as purer pigment occurs in the gold braid highlights on Tarleton's cuffs, and the stronger surface yellows of the billowing flag.

Two samples of flesh paint show vermilion as the principal colorant with lead white, and black in the relative shadows. No red lake pigment was found in flesh, although sampling was not comprehensive. Vermilion also occurs in many of the warm and darker brown underpaints, where it is combined with black pigments. A strongly coloured yellow earth pigment is also present in underlayers (for example, in the paint of the bundle of drapery at lower left), beneath orpiment, and paints containing black pigment with orpiment and vermilion (FIG. 178).

Tarleton's troops of the British Legion serving in the colonial war wore tight-fitting green jackets, whereas Reynolds's picture shows his sitter dressed seemingly in blue. The pigment is Prussian blue, which, while somewhat greenish in tone, could not be described as a proper green colour (FIG. 179). However, in a cross-section

FIG. 179 *Colonel Tarleton*, detail of the sitter's blue-green jacket.

from the sleeve the upper paint layer includes a small amount of yellow pigment and the sample shows that initially the drapery was painted with a mixed green underlayer (FIG. 180). It is possible that a yellow glaze at the surface has faded, or has even been removed, perhaps mistaken for yellow varnish. The sky paint, however, is an authentic blue, painted using finely ground natural ultramarine with white, over, in places, a layer of light grey, rather in the manner of certain pictures by Claude, such as *A Seaport* of 1644 (NG 5).

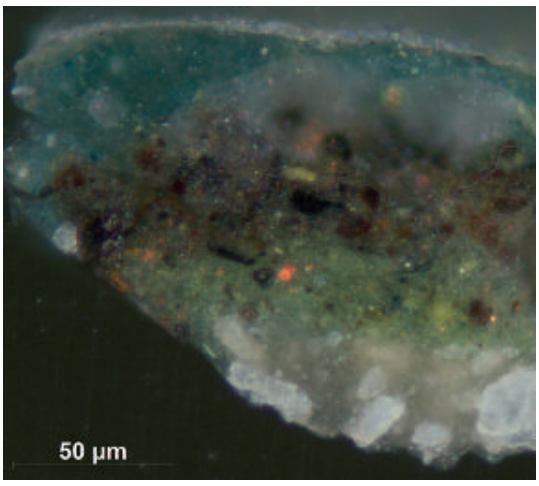


FIG. 180 *Colonel Tarleton*, paint cross-section from the proper right sleeve of the sitter's jacket.

CAT. 14

Mrs Mary Robinson ('Perdita')

The Wallace Collection (P45)
1783–4
75.6 × 62.5 cm (bust or three-quarter-length)
Thread count of canvas: 19 vertical, 22 horizontal threads cm^2 (twill weave)

Mrs Mary Robinson (1758–1800) was an actress, poet, author and famed society beauty, best known for her role as Perdita in *The Winter's Tale.* She was the mistress of the Prince of Wales[1] and later had a long-lasting affair with Colonel Tarleton (see CAT. 13). She became partially paralysed in 1783, probably after suffering a miscarriage. Reynolds painted her portrait on several occasions and the Wallace Collection picture dates from after her paralysis, which is perhaps alluded to in the contemplative and melancholy pose (FIG. 181). The date of the painting and the number of sittings related to its execution are unclear. Reynolds's 'Sitter Books' for 1783 and 1785 are lost, but a single appointment is recorded on 3 February 1784. Other appointments in 1787 and 1789 may have been sittings, perhaps even for another painting, but equally may have been social visits.[2]

The portrait is painted on a single piece of twill-weave canvas.[3] A cross-section from the foreground confirms that the ground was applied in a single layer and contains a mixture of lead white and calcium carbonate, with a small amount of a strongly-coloured iron oxide red pigment which produced a slightly pinkish colour (FIGS 182, 183).[4]

Elements of the painting, such as the hand and drapery, are less finished and have a freely sketched style with broad, loosely brushed strokes of paint. The white highlights of the drapery are applied in a stiff, textured paint with clearly visible brush marks. Lines of a more liquid, mauve-grey paint are used to denote the folds of the dress in a summary style, with additional strokes of white impasto applied subsequently. The hand is blocked in with little detail and a few broad strokes of paint stand for the red bow at the front of the dress. This contrasts with the more finished and refined painting of the face and bust, which have been worked up to a greater degree. It is not clear if Reynolds himself regarded this as a completed work. The painting was never sold and it is probable that it remained in his studio until his death.[5] The image was engraved in 1787 by William Birch.[6] In Birch's unpublished memoirs he mentions that the painting 'though never finished in the ground and drapery was the best specimen of Sir Jos's flesh tints'.[7] A number of unfinished paintings remained in Reynolds's studio on his death and there was evidently discussion as to whether portraits were finished or not.[8] Joseph Farington recorded such a conversation with Reynolds's

FIG. 181 Joshua Reynolds, *Mrs Mary Robinson ('Perdita')*, 1783–4. Canvas, 75.6 × 62.5 cm. The Wallace Collection, Inv. P45.

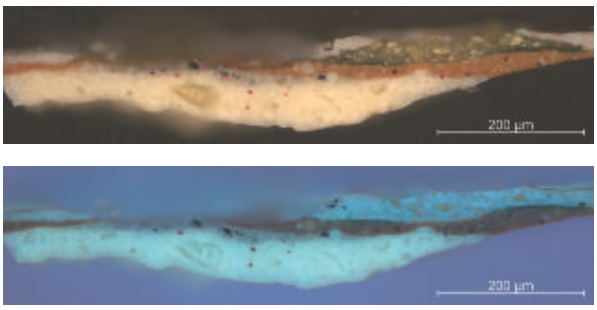


FIG. 182 (Above) *Mrs Mary Robinson ('Perdita')*, paint cross-section from the rocky foreground.

FIG. 183 (Below) *Mrs Mary Robinson ('Perdita')*, FIG. 182 photographed under ultraviolet illumination.

FIG. 184 *Mrs Mary Robinson ('Perdita')*, X-radiograph.

FIG. 185 *Mrs Mary Robinson ('Perdita')*, detail photographed in raking light.

executor, Edmund Burke: 'We went into the dining parlour where stood the whole length of the Duchess of Gordon. Mr. Burke asked me if I considered that as a finished picture in such a manner as Sir Joshua wd. have suffered to pass. I answered that I had seen many pictures of his less finished.'[9]

Despite the somewhat unfinished appearance of the portrait of Mrs Robinson, there is nonetheless some degree of reworking and the composition underwent a significant change before the final pose was established. The X-ray image revealed that the sitter's arm was origin-ally raised in a 'penserosa' type pose, with the sitter's chin resting on her curled fingers (FIG. 184). Textured, directional brush marks remain visible through the upper paint layers where this part of the composition was laid in (FIG. 185).[10] A reserve is visible along the outer edge of the lowered arm in the X-ray image, seen as a dark line of less radiographically dense paint, suggesting that the composition was changed at a fairly early stage, with the background subsequently filled in around the figure.[11] The eye was adjusted to emphasise the sitter's downward gaze. The reserve in the X-ray image is significantly larger than the finished eye, and the eyelid was lowered to accentuate the sitter's contemplative mood once the more typical 'penserosa' pose had been abandoned.[12] Lowering the arm enlarged the view of the horizon where the sitter's gaze is focused and both X-ray and infrared images show that the horizon line was also made rather higher and straighter.

There is a second unfinished version of the portrait, now in the Yale Center for British Art (about 1784, B1981.25.520; FIG. 186). This was sketched in paint on a twill-weave canvas and is larger than the Wallace Collection painting. The canvas of the Yale picture was reused and in the X-ray image the inverted figure of a girl can be seen.[13] The larger format canvas means that there is more space around the figure of Mrs Robinson, although the top of the head is nearer to the upper edge of the canvas, but the scale of the figure is also reduced. The face is more complete than the figure and drapery, which are only roughly laid in, so it seems that that painting was abandoned. The exact relationship between the two paintings is unclear, but as the Yale version depicts the final position of the arm rather than the earlier 'penserosa' pose, it must be that it was begun after the Wallace Collection picture was underway.

Near the top edge of the Wallace Collection painting there is a broken horizontal line of red paint and a related smeared patch, which have been subsequently painted out (FIG. 187). The red paint may have been accidentally transferred from the edge of another painting when pictures were stacked. A cross-section taken

FIG. 186 Joshua Reynolds, *Mrs. Robinson*, about 1784. Oil on canvas, 88.6 × 68.9 cm. Yale Center for British Art, New Haven CT, Inv. B1981.25.520.

from this area shows that there is no varnish layer between the red paint and the underlying sky (FIGS 188, 189).

The painting is executed with a limited palette consisting of muted blues and greys, which contrast with the light areas of the flesh and drapery. A grey underpaint containing lead white, bone black, an additional carbon black pigment, probably charcoal, and a small amount of vermilion appears in two cross-sections: those from the foreground rock and from the dark sky in the upper right-hand corner (FIGS 182, 188). The grey colour may have been used initially to block in the light and shade of the seascape scene surrounding the figure. The dark stormy background is then built up in several layers of varying shades, all containing mixtures of pigments (FIGS 188, 190). Prussian blue mixed with lead white and some black dominates in the bluest parts of the sea, while vermilion is incorporated into the mixture to render a warmer, greyer tone. As in the underpaint, both bone black and charcoal black seem to be used throughout the background, sometimes mixed together. Particles of a red earth pigment were also identified.

A cross-section from the rock on which Mrs Robinson rests her arm shows that this part of the painting was also built up in several layers with marked contrasts of colour (FIGS 182, 183). Over a grey underpaint, a strongly coloured orange paint layer was applied containing red earth, lead white and a little bone black.[14] This was followed by a medium-rich yellow layer that appears highly fluorescent under ultraviolet light. The pale yellow, opaque pigment present has been identified as patent yellow, by comparison to analyses of reference standards, and has the approximate composition $PbCl_2.5\text{-}7PbO$.[15] As far as we are aware, this is the only known occurrence of patent yellow, a relatively uncommon pigment, in Reynolds's work. The sequence of layers finishes with a thin scumble of grey paint rather similar in composition to the first underpaint layer.

The lightest paint of the drapery contains largely lead white with a few fine particles of black and vermilion and some particles of the blue pigment smalt. The

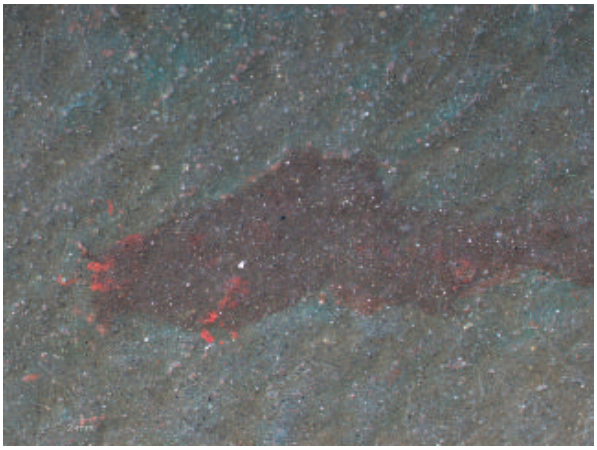


FIG. 187 *Mrs Mary Robinson ('Perdita')*, photomicrograph showing deposit of red paint in sky that has been painted out.

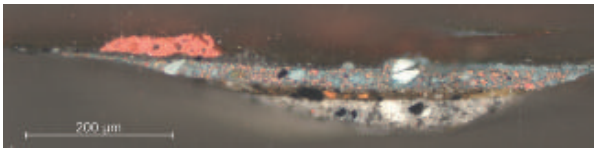


FIG. 188 *Mrs Mary Robinson ('Perdita')*, paint cross-section from the sky.

FIG. 189 *Mrs Mary Robinson ('Perdita')*, FIG. 188 photographed under ultraviolet illumination.

FIG. 190 *Mrs Mary Robinson ('Perdita')*, paint cross-section from the sky.

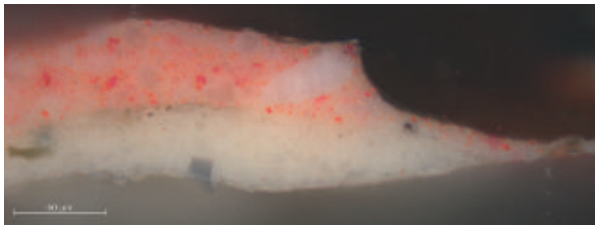


FIG. 191 *Mrs Mary Robinson ('Perdita')*, paint cross-section from the red bow.

FIG. 192 *Mrs Mary Robinson ('Perdita')*, detail of red bow on the sitter's dress.

FIG. 193 *Mrs Mary Robinson ('Perdita')*, detail of the horizon showing the patchy remains of a surface coating.

smalt has retained its blue colour, particularly in a cross-sectional sample from the red bow, where the underlying drapery paint has been protected from light (FIG. 191).

The accents of colour in the painting are provided by the red bow, which is painted with a mixture of vermilion and lead white (FIGS 191, 192),[16] and the rosy paint of Mrs Robinson's cheeks and lips. No sample could be taken from the face, but there seems not to be any fading of the flesh tones in this work. It seems reasonable to assume that since vermilion occurs elsewhere in the painting it is likely that this pigment also provided the main colour for the flesh paint.

The paint medium is based largely on heat-bodied walnut oil, which was identified in the white paint of the dress and in the blue paint of the sea in the background, as well as in the rather more cracked black paint used to create the shadow of the rock in the lower left foreground.[17] Conversely, heat-bodied linseed oil was identified in the dark grey paint of the sky in the upper portion of the painting.[18] Two samples from the background, one from a brown layer visible over the surface of the sea (FIG. 193) and one from the darker grey paint in the sky, contained small amounts of methylated copalic acid, a component indicative of a resin of the Leguminosae family, either of the copaiba balsam type or a hard copal.[19] This was not detected in any of the samples of varnish, or in fact in paint samples from elsewhere on the painting, indicating that this material is not related to a subsequently applied surface coating or an overall conservation treatment. Rather, it seems likely that this represents an original constituent of the paint medium, perhaps used in a final glaze layer in these passages.[20]

Despite the unfinished appearance of this painting, technical study has revealed complicated layering of paint, as well as significant compositional changes that have made this portrait such a striking and affecting image.

CAT. 15
Lord Heathfield of Gibraltar

The National Gallery (NG 111)
1787
142 × 113.5 cm (bishop's half-length)
Thread count of canvas: 20 vertical, 18 horizontal threads per cm^2 (twill weave)

The portrait of Lord Heathfield of Gibraltar (FIG. 194) was commissioned by the publisher Alderman John Boydell. There are seven appointments for Heathfield recorded in the 'Sitter Books' between August and September of 1787 and a payment for £105 is recorded in October of the same year.[1] Reynolds depicts Heathfield, who had become a national hero after his successful defence of Gibraltar against Spain, brandishing a large heavy key and chain said to be that of the Fort of Gibraltar.[2]

The painting was examined thoroughly in the Conservation Studio of the National Gallery in 2009 by Martin Wyld, then Chief Restorer, accompanied by scientific study using cross-sectional analysis and medium analysis by GC–MS and FTIR microscopy. The results of this study were published subsequently in the *Technical Bulletin*, although the X-radiograph (FIG. 195) was not included in that account.[3] It was judged that no cleaning of the picture could be undertaken by conventional methods because of the close constitutions of Reynolds's paint layers and the multiple layers of darkened varnish on the picture's surface

The painting support is a single piece of twill-weave canvas that has been prepared with a single layer of ground composed primarily of calcium carbonate and lead white (FIG. 196). The canvas is a bishop's half-length, slightly larger than the more common standard half-length canvas size, a format used also for the portrait of Lady Cockburn (CAT. 7).

The hilt of Heathfield's sword can be seen at the sitter's hip in the completed painting. However, this was not Reynolds's first idea for the composition and the X-radiograph reveals that initially Heathfield was not grasping a key, but held his sword instead, angled across his body (FIG. 198). In this earlier composition the sitter's right hand grasped the hilt of the sword and his right elbow was raised further into the area of sky, while the sitter's left hand held the tip of the sword blade near

FIG. 194 Joshua Reynolds, *Lord Heathfield of Gibraltar*, 1787. Canvas, 142 × 113.5 cm. The National Gallery, NG 111.

FIG. 195 *Lord Heathfield of Gibraltar*, X-radiograph.

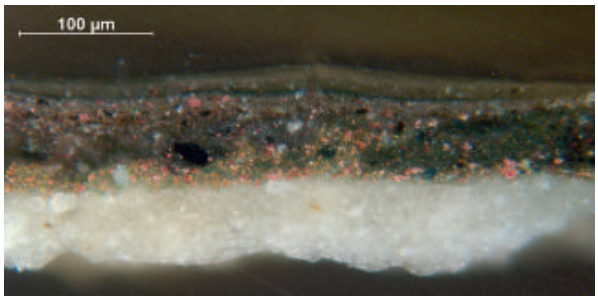


FIG. 196 *Lord Heathfield of Gibraltar*, paint cross-section from the dark background, left of the sitter's head. The single layer of white ground is evident.

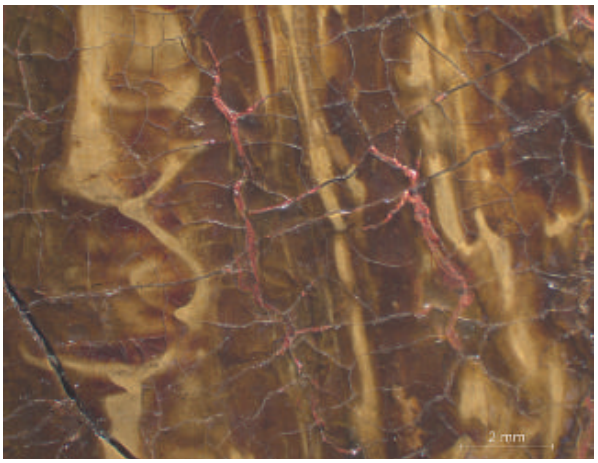


FIG. 197 *Lord Heathfield of Gibraltar*, photomicrograph of the right epaulette showing red paint emerging through cracks.

his hip, in the lower right corner of the canvas. There is a diagonal line visible in the X-ray image across the sitter's right shoulder that may indicate yet another abandoned position of the sword blade.

Some changes were made to the costume as the portrait was painted. A brushstroke beneath the sitter's chin marked a higher position of the collar and a circle on the left side of the sitter's chest indicated the first placing of the star of the Order of the Bath. Sketched brushstrokes roughly marked out the folds in the fabric of the jacket, including a scalloped brushstroke on the sitter's right sleeve.

The atmospheric background of the painting, filled with brooding clouds and billowing smoke, was built up with multiple layers of paint. A cross-section taken from the sky shows a mixed grey underlayer followed by a bright blue paint and finally a reddish brown layer containing a 'murrey' type mixture, to depict the billowing smoke. The whole of the painting, and particularly the background, has been affected by an extensive irregular network of drying cracks, some rather broad. The drying cracks must have appeared only a few years after the completion of the painting, so that by the early nineteenth century it was already disfigured by disruption of the paint.[4] The cracks are visible on the picture itself and register strongly in the X-radiograph; many of them have been filled and retouched in the past. It seems that even after the cracks were restored the surrounding paint has continued to move, so that the fills are surrounded by raised ridges of original paint. In some places

FIG. 198 *Lord Heathfield of Gibraltar*, detail of X-radiograph.

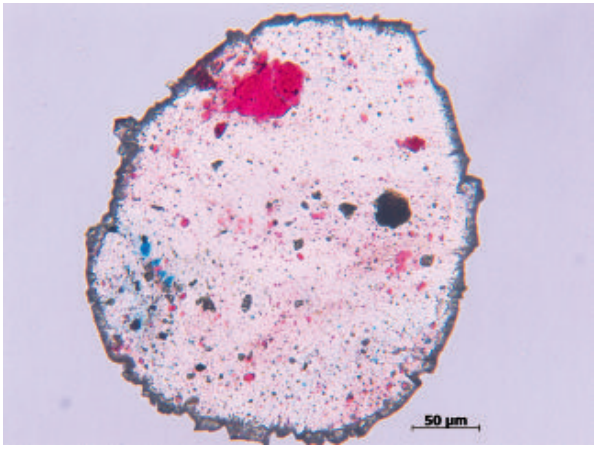


FIG. 199 *Lord Heathfield of Gibraltar*, unmounted fragment of paint from the background, photographed in transmitted light after compression in a diamond anvil cell for FTIR-microscopy. Red lake pigment and Prussian blue are present.

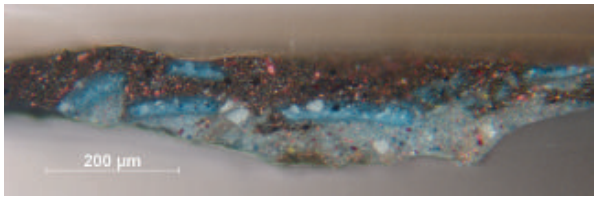


FIG. 200 *Lord Heathfield of Gibraltar*, paint cross-section from the sky at the top edge showing bright blue paint beneath the surface.

the paint seems to cover the edges of the fill. As in *Mrs Jane Braddyll* (CAT. 16), undried paint from lower layers has emerged from cracks in the paint and overlying varnish layers (FIG. 197), in some places forming microscopic beads of material at the surface. Analysis by GC–MS of a paint sample from the background identified heat-bodied linseed oil with the addition of a substantial proportion of mastic resin. Examination of the sample before organic analysis showed a paint matrix with a high proportion of medium surrounding only relatively few pigment particles, including red lake and Prussian blue (FIG. 199). Another paint sample taken from the area of a drying crack appeared less medium-rich and more opaque, and here GC–MS analysis identified a lower proportion of mastic to the heat-bodied linseed oil, which perhaps could be an indication of differing paint media in different parts of the picture. It is a clear conclusion that the addition of mastic to the oil medium was a fundamental cause of the severe drying cracks seen in this painting.

Not all the paint layers contain resin, and the bright blue underlayers in the sky (FIG. 200) were found to consist of linseed oil alone. Samples from other areas of the painting, such as the rocky landscape in the lower left corner, also show alternating layers of solid more conventional looking paint, and more medium-rich and resinous layers. In cross-section the highly resinous layers can be seen to fluoresce brightly in ultraviolet light under the microscope (FIGS 201, 202).

In addition to the medium-rich paint layers, varnish-like glazes were found in many areas of the painting. A sample taken from Lord Heathfield's waistcoat showed that above a white paint, a thick glaze is present that contains sparse particles of vermilion, black and lead-tin-antimony yellow.[5] Reynolds must have applied this translucent insubstantial layer to give the white waistcoat a more creamy yellow tone, in contrast to the pale breeches, an effect now diminished in impact. The bright red vermilion of Lord Heathfield's red coat has also been modified with glazes containing a mixture of pigments. A combination of Prussian blue, some brown pigment, black and a few red particles were detected under the microscope in an unmounted fragment of the glaze.

Reynolds's painting technique has caused many defects in the portrait of Lord Heathfield, although the force of the composition and Heathfield's weighty presence remains impressive. The painting would benefit from cleaning, but as explained in our earlier account,[6] this is not possible to accomplish safely with presently available methods.

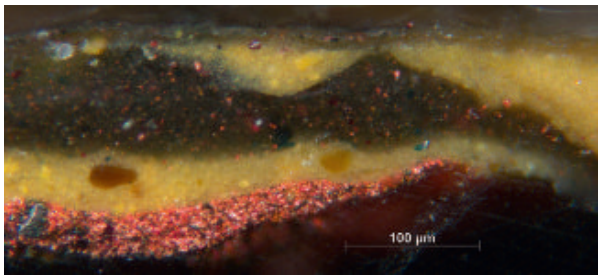


FIG. 201 *Lord Heathfield of Gibraltar*, paint cross-section from the landscape in the lower left corner.

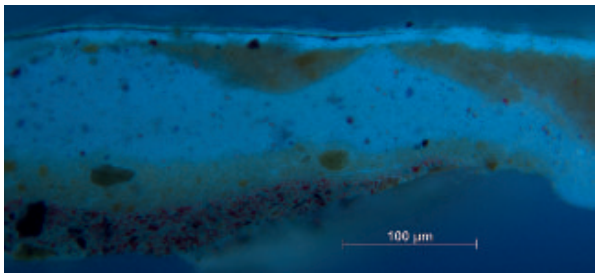


FIG. 202 *Lord Heathfield of Gibraltar*, FIG. 201 photographed under ultraviolet illumination.

CAT. 16
Mrs Jane Braddyll

The Wallace Collection (P47)
1788
Oak panel, four boards
75.5 × 63.4 × 1.2 cm (bust or three-quarter-length)

Mrs Jane Braddyll (FIG. 203) is the only painting examined in this study that was executed on a panel support. It forms a pair with a portrait of the sitter's husband, Mr Wilson Gale Braddyll (Private Collection). It is likely that both paintings were commissioned after Mr Braddyll was given Reynolds's portrait *George IV when Prince of Wales* (Tate, N00890), which dates from 1785, thus a few years earlier.[1] In 1789, his last active year, Reynolds painted *The Braddyll Family*, now in the Fitzwilliam Museum, Cambridge (PD.10-1955).

The oak panel support of Mrs Braddyll's portrait has a horizontal grain and is made from four horizontal boards (see FIG. 12, p. 15). Dendrochronology has shown that the boards all derive from the same tree,[2] and the two central members have the same dimensions but the upper and lower boards are narrower.[3] The boards are assembled with glued butt joints,[4] with no dowels or cleats, although small wooden buttons have been glued over the joins on the reverse of the panel at the proper left edge.[5] The glue has run down the reverse of the panel, although the drips run upwards in the opposite direction to the image of the painting. Splintering along the back edges of the boards appears to indicate that they were dry and well-seasoned before they were cut to size. The reverse faces of the boards show regular saw marks, except for the upper board, which has horizontal tool marks, possibly made by a plane.[6]

FIG. 203 Joshua Reynolds, *Mrs Jane Braddyll*, 1788. Oak panel, 75.5 × 63.4 cm. The Wallace Collection, Inv. P47.

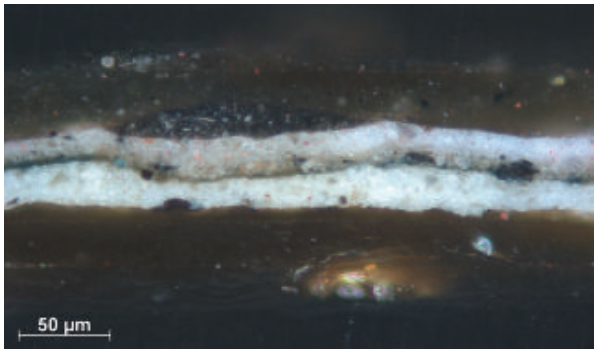
The panel was prepared first with a translucent sealing layer, which is visible in small paint losses at the edges of the picture, and has a glossy, orange-brown appearance (FIG. 204). This coating appears to partially fill the wood grain and with the aid of the microscope can be seen to extend beneath the ground and paint layers. Cross-sections confirmed the presence of this material and revealed that it consists of several applications, visible in ultraviolet light under the microscope (FIGS 205, 206). Although the exact number and the thicknesses of the layers vary between samples, there is a consistent layer with a distinctly orange fluorescence directly below the ground, with one or more highly fluorescent layers below this, all of which seem to be separated by non-fluorescing layers, perhaps dirt interfaces. Analysis by GC–MS identified pine resin with a little heat-bodied linseed oil, indicating that these layers consist largely of a form of varnish.[7] There was no evidence of protein by FTIR-microspectroscopy, suggesting that none of these applications contains glue size. The differences in the fluorescence behaviour could suggest that there is another unidentified material present, or it may indicate a variation in the proportion of oil and resin in the different layers, with perhaps more oil, or only oil, used in the final application. The rarity of panel paintings from this period means that little comparable data is available to assess whether sealing layers of this type were common practice, or more specifically linked to Reynolds's working methods. Robert Dossie, however, mentions that panels prepared for paintings of 'any value' should be 'brushed over with hot drying oil, as long as it will soak it in; and then covered with a coat of white lead, or flake, coloured according to what may be desired'.[8]

Following the application of the sealing layers, a

FIG. 204 *Mrs Jane Braddyll*, photomicrograph showing a damage at the left edge of the panel where the sealing layer can be seen on the surface.

very light grey ground was applied over the whole panel. This is composed primarily of lead white and is the only ground in this study that does not contain calcium carbonate in addition – perhaps an indication that the ground was applied in Reynolds's studio. A mixture of additional pigments was added to give the light grey colour, including some bone black, certain particles of which have a very brown appearance, as well as a carbon black of larger particle form, probably charcoal, and a little brown earth.[9] A few small dark blue particles are also visible in cross-section, which are probably Prussian blue as well as some fine red particles (FIGS 207, 208). The binding medium of the ground was identified as heat-bodied linseed oil.[10] The ground was applied with a broad brush in roughly horizontal strokes, which are clearly visible in the X-ray image (FIG. 209).

Mrs Braddyll is depicted in a 'penserosa' type pose, variations of which were regularly used by Reynolds for female portraits; this is a late example. The X-ray image reveals some adjustment to the position of the hand on which the sitter rests her chin, but otherwise there are



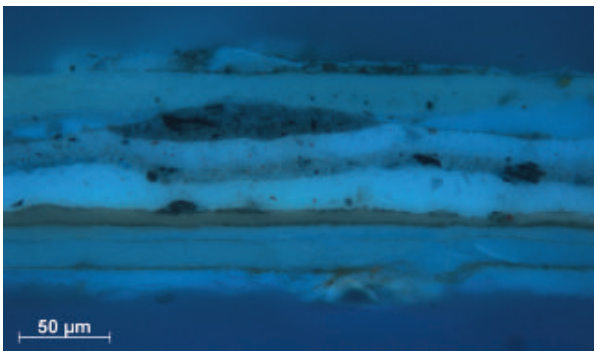
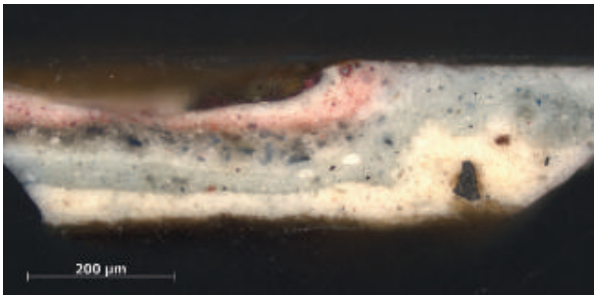


FIG. 205 (Above) *Mrs Jane Braddyll*, paint cross-section from black drapery at lower edge. Above the light grey ground is a thin layer containing Prussian blue, followed by two further grey layers, presumably related to the underlying white drapery. This is covered with a stroke of black paint.

FIG. 206 (Below) *Mrs Jane Braddyll*, FIG. 205 photographed under ultraviolet illumination. The distinct fluorescent layers beneath the light grey ground relate to the sealing of the panel.



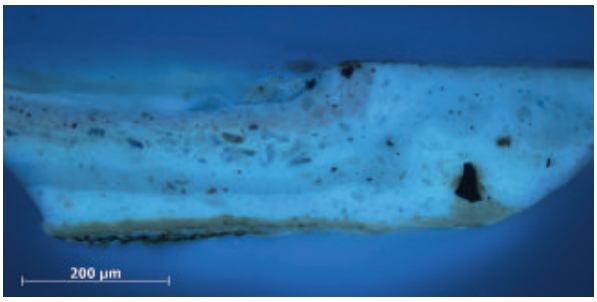


FIG. 207 (Above) *Mrs Jane Braddyll*, paint cross-section from the left edge. Layer structure includes sealing layers on the panel, ground, three layers of blue/grey paint containing mixtures of lead white, smalt, Prussian blue and bone black, followed by pink paint in two layers, all depicting the sky. The upper layer of mixed brown paint relates to the foliage of the tree.

FIG. 208 (Below) *Mrs Jane Braddyll*, FIG. 207 photographed under ultraviolet illumination.

FIG. 209 *Mrs Jane Braddyll*, X-radiograph.

FIG. 210 *Mrs Jane Braddyll*, detail of infrared reflectogram.

no significant pentimenti, although a larger area of sky was originally laid in at the left edge of the picture before being covered with the foliage of the trees. The loose brushstrokes with which Reynolds sketched the position of the body and drapery can also be seen in the X-ray image and appear to be a consistent part of Reynolds's method when painting figures from life.

The figure and the drapery were executed in a fluid paint and many details applied wet-in-wet with strokes of paint blended on the surface of the painting. Where the bodice overlaps the sitter's arm, the grey paint has picked up the still wet flesh paint, producing a marbled and feathered effect (FIG. 211). The infrared reflectogram image reveals the use of hatched strokes of a dark underpaint to create the shadow along the inner edge of the raised arm (FIG. 210); it appears that the half shadows in the modelling of the face have been similarly constructed. The soft impasto of white highlights, especially on the ruffles at the sitter's bust and elbow, is well preserved. The raised spots depicting the bracelet have been applied rapidly and fluid paint trails from one pearl to the next (FIG. 212). The slightly darker grey from the more shadowed area of the drapery near the lower edge contains particles of starch, identified by FTIR-microspectroscopy, visible in cross-section as relatively large rounded translucent grains. Presumably starch was added as an extender to provide additional bulk to the paint and improve the working properties.[11]

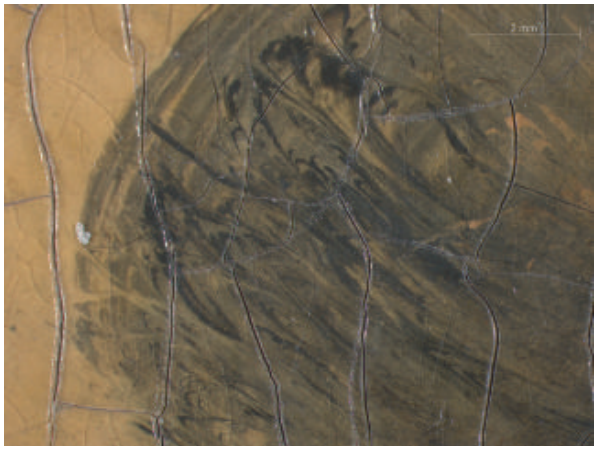


FIG. 211 *Mrs Jane Braddyll*, photomicrograph of area where drapery crosses onto sitter's arm showing wet in wet application.

The figure and foreground are reasonably well preserved with very little loss or evidence of drying defects. The flesh paint and white drapery are marked by a pronounced set of fine sharp-edged brittle cracks. By contrast, the foliate background shows considerable evidence of drying defects. A variety of different cracks are visible, many of which have multiple edges, with a crusty appearance reminiscent of a molten material like

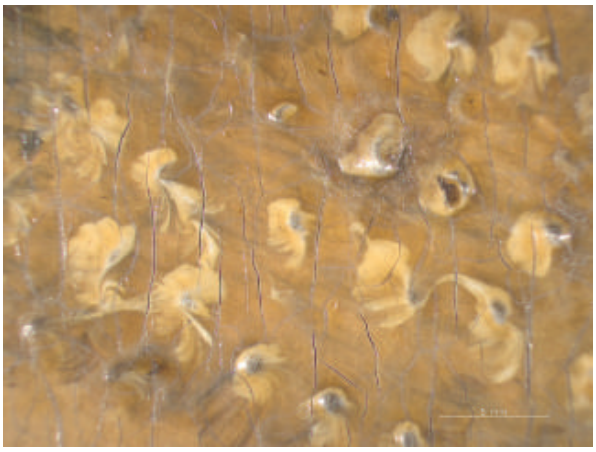


FIG. 212 *Mrs Jane Braddyll*, photomicrograph of sitter's pearl bracelet.

FIG. 213 *Mrs Jane Braddyll*, photomicrograph of foliage in the background showing cracking and liquid appearance of paint beneath varnish.

FIG. 214 *Mrs Jane Braddyll*, photomicrograph of foliage in the background showing paint that has emerged from a crack.

cooled lava, where the surface has dried but the underlying paint remained fluid and continued to flow (FIG. 213). Liquid paint has emerged along some cracks onto the surface and has dried in small globules (FIG. 214). In addition, the X-ray image revealed a network of wide drying cracks in the background, which are not immediately discernible at the paint surface (FIG. 215). Examination with the stereomicroscope showed that these have been filled in with a very medium-rich material that has also developed its own cracks, although they show evidence of having more brittle edges than the cracks in the surrounding paint. Reynolds's own 'Technical Notes' describe having to retouch cracks and it is clear that his paintings, which had deteriorated, continued to be worked on. These defects may well have occurred before the picture left his studio.[12]

A cross-section sample from the background in the upper right corner shows that here there is no very clearly defined layer structure (FIGS 216, 217). A dark grey layer containing the blue pigment smalt is intimately mixed with an overlying paint that contains a bright red iron oxide pigment.[13] Parts of the sample contain also additional earth pigments and lead white, but it is not possible to define an ordered sequence of paint layers. This particular cross-section also shows a void in the paint layers, perhaps formed as the paint has flowed, and which has been filled with a highly fluorescent, translucent material, presumably either paint medium or varnish. These features seen at the micro level in samples correlate with the appearance of the paint surface under magnification, where beneath the varnish the paints have the appearance of retaining a fluid look in many areas (FIG. 213).

In cross-section the paint layers are generally highly fluorescent under ultraviolet light and in places the interface between the paint and varnish is quite indistinct. Medium analysis, carried out by GC–MS, showed that although the binding medium is based on oil, a significant proportion of natural resin was incorporated with the binder throughout this picture. Large amounts of pine resin, in addition to significant amounts of mastic resin, were identified in each of the paint samples analysed, even where the varnish had been carefully removed prior to sampling.[14] The particularly cracked parts of the foliage in the background appeared to contain a higher proportion of mastic resin and the addition of these resins to the paint medium is presumably a major reason for the severe drying defects. The oil component of the binding medium is heat-bodied linseed oil

for the most part. In one sample, however, from the more yellow paint in the background, heat-bodied walnut oil was identified.[15]

Despite the significant problems of condition in the background of this painting, the fluid paint application and the painterly effects Reynolds achieved in the handling of the drapery and figure have produced a beautifully rendered portrait, displaying the bravura confidence of his late style.

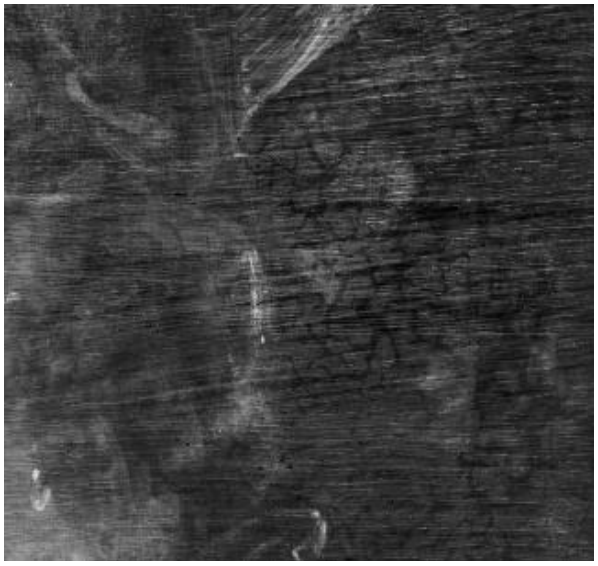


FIG. 215 *Mrs Jane Braddyll*, detail of X-radiograph from the area to the right of the sitter's head.

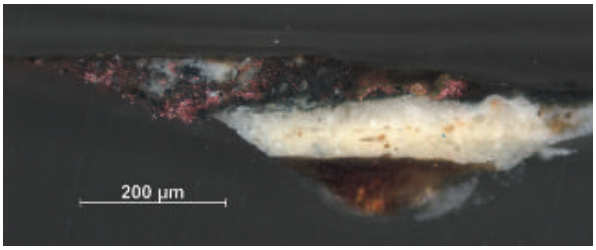


FIG. 216 *Mrs Jane Braddyll*, paint cross-section from background foliage.

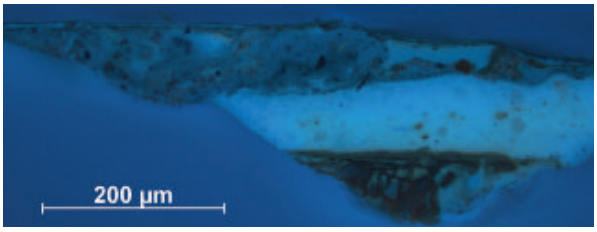


FIG. 217 *Mrs Jane Braddyll*, FIG. 216 photographed under ultraviolet illumination.