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Canaletto's 'Venice: The Feastday of S. Roch'

David Bomford and Ashok Roy

Of the many pictures which receive attention in the Conservation Department of the National Gallery, only a proportion require technical examination in support of their conservation treatment. However, there are occasions when paint samples can usefully be taken with the aim of understanding better both the overall, and the more specific features of a painter's technique. This is particularly valuable when the results can be related to data available for others of the artist's work. Such is the case for the recently cleaned Canaletto in the National Gallery Collection, *Venice: The Feastday of S. Roch* (No.937) (Plate 6, p.43), from which a limited number of paint samples were taken for examination of the layer structure and pigment composition [1]. The results are reported in brief here, with four paint cross-sections from the picture reproduced on p.43.

Venice: The Feastday of S. Roch shows the Scuola di S. Rocco much as it appears today, with some of the surface details slightly simplified; adjacent buildings are now somewhat altered. The Church of S. Rocco (at the right) had then lost its original façade and the late eighteenth century façade imitating the style of the *Scuola* itself was not yet constructed. The viewpoint from which Canaletto apparently painted the picture is (as in so many of his pictures) an impossible one: the *campo* is in reality much narrower than it appears here, restricted on the near side by the end of the Frari church. Whether Canaletto used an optical device such as a *camera obscura* it is impossible to say: however, it is clear that he used elementary geometrical instruments in the actual painting process. Everywhere straight lines are ruled, and circles and arcs are drawn with compasses: in the centre of every arch and roundel is the unmistakable hole of the compass point (Fig.1).

Paintings and drawings by Canaletto have been the subject of a major exhibition at The Queen's Gallery, Buckingham Palace during 1980 – 81, and the *Catalogue* [2] includes a summary of paint analysis carried out during preparations for the exhibition by Pamela England at the Hamilton Kerr Institute, Cambridge. We have found No.937 to be technically close to the pictures examined there, and in addition it has been possible to identify positively a deep green pigment used by the painter (see below): a material which appears to be a regularly-used component of Canaletto's paint.

The exact date of No.937 is not known with certainty, but Michael Levey concludes the picture to be *c.*1735 [3]. In the context of date, it is interesting to note that Canaletto's choice of ground for his canvases underwent several transitions during his career. From the mid-1730s to the mid-1740s the pictures have double oil grounds comprising a red-brown or yellow-brown ochreous layer, underlying a light cream layer of lead white tinted with a little brown ochre or umber [4]. This is precisely the constitution of the ground in the present picture (see Plate 7a, p.43), and supports the suggested date.

A third layer of a warm light grey colour extends everywhere under the architecture and foreground. Strictly an extensive underpaint rather than a ground layer, it is present in all cross-sections other than those taken from the sky. Although it can be seen to vary slightly in composition from sample to sample, it does not appear to be modelled: architectural details and local colour are glazed or scumbled over it. It can be seen unmodified in many places, perhaps most clearly in the hand of the Cancelliere Grande (Fig.2), the principal figure in red immediately preceding the Doge.

The sequence of painting can be seen clearly by examining the picture surface. The architecture was painted first over its warm grey underpaint and completed even down to the steps leading up to the main door of the *Scuola:* although the steps can no longer be seen, there are clear horizontal lines beneath the figures which now obscure them. The figures, the awning, garlands and so on were all painted over the completed architecture; the sky was painted around it, prominent brushstrokes following the outlines of the buildings.

The blue pigment of the sky is *Prussian blue,* a relatively early instance of the use of this synthetic pigment, in mixture with lead white. The upper layer of the sky has a grey underpaint of charcoal and white (Plate 7a), but it is difficult to judge its intended effect on the final colour since areas of wearing have allowed the influence of the orange-brown ground layer to become noticeable. The lead white with which the blue is mixed is present, in part, as large, faintly 'pearlescent' aggregates of pigment, a feature of all the samples of paint in which white forms a considerable proportion [5].

Canaletto's bright yellow and more orange-yellow pigment is *Naples yellow* (lead antimony oxide), detected initially by XRD and confirmed by spectrographic analysis [6]. Examples on the picture include the Doge's golden robe, the brightest touches on the tasselled swags over the windows of the *Scuola,* and the highlights of the frames of the pictures displayed along the walls of the buildings. Where the paint has a warmer orange tinge, reddish brown earth pigment has been combined with the Naples yellow. The same pigment also finds use in the areas of mixed green (see below).

Vermilion is used for the scarlet robe of the

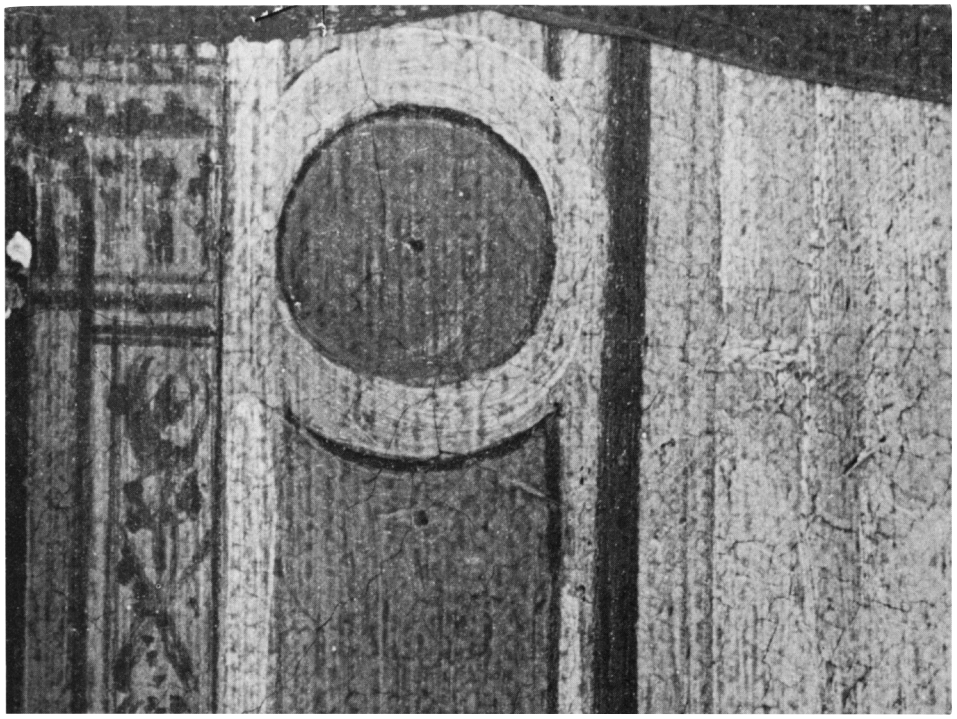

Figure 1
Detail of the architecture showing Canaletto's use of the compass.

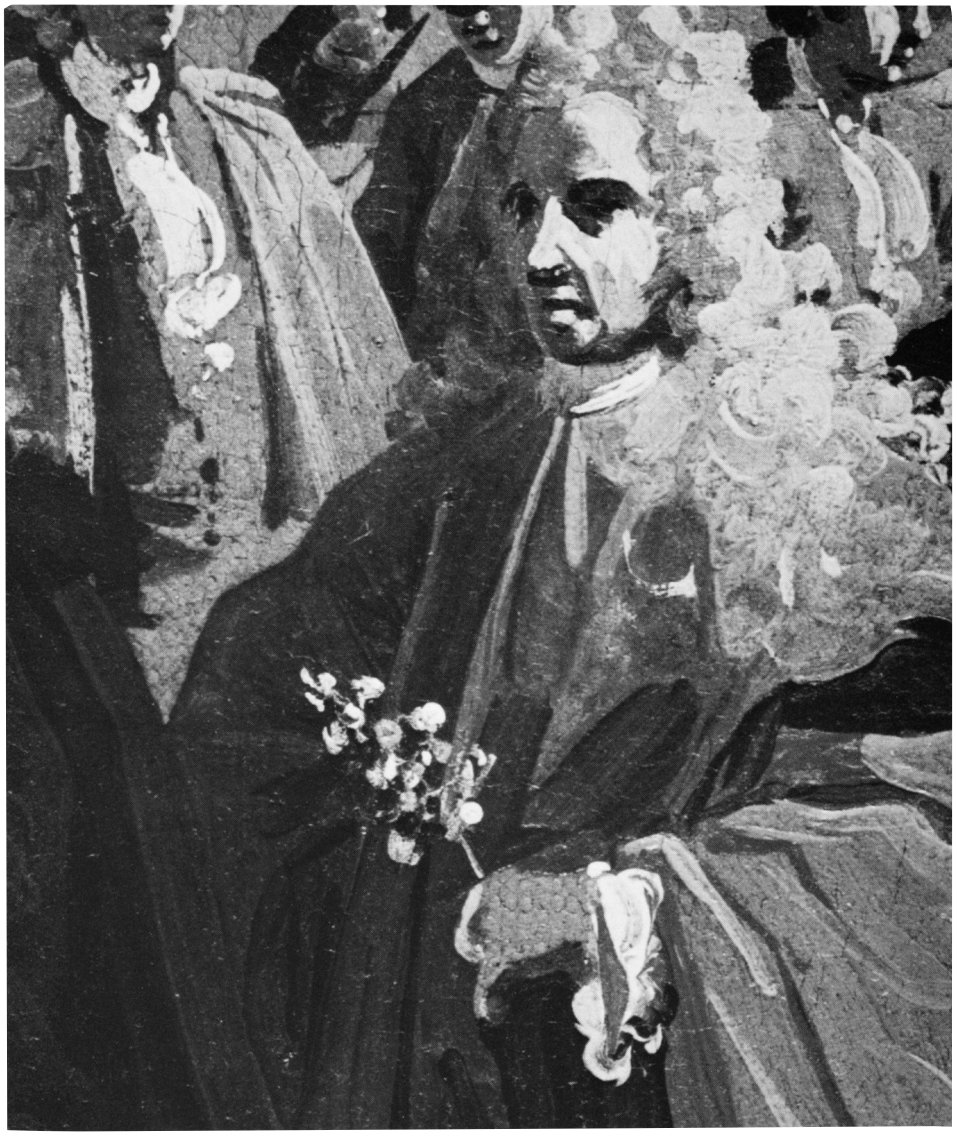

Figure 2 Detail of the figure of the Cancelliere Grande showing exposed underpaint in the hand.

Cancelliere Grande (Plate 7b); a little lead white has been added to the red pigment [7]. In the sample examined the vermilion is inhomogenous both in particle size and colour, with a few large crystalline particles in association with finely-ground pigment, the latter ranging from a brilliant red to a strong orange.

Red lake pigments are also employed, not so much as glazes, but in tint with opaque pigments to produce the delicate mauves and pinks of the draperies. For example the paint of the rose-pink textile which hangs from the sill of the second storey window is a mixture of red lake pigment and white, whereas the lilac robes of the three secretaries of the Savio Grande contain the same pigments, but in addition make use of the bluish cast of charcoal black to produce the required shade of mauve. In the second example no blue pigment at all is present (see Plate 7d).

One aim of sampling was to determine how areas of green had been achieved, whether a green pigment had been used and if so which of the available choices, or whether mixtures of blue and yellow had been employed. In several samples, and in all those of foliage, a single intensely green pigment was found, the particles of which consist of dark green to olive-green, irregular edged, flattish fragments, mostly of a fair transparency. Colourless crystalline particles accompany the green. Microscopically, the appearance is of some form of *green earth* (terre verte), a naturally occurring marine clay, but the intense colour of the Canaletto sample is unusual (see Plate 7c). X-ray powder diffraction of a sample containing the green yielded a complex pattern, including amongst other phases the diffraction lines for the micaceous mineral, glauconite ($K(Fe,Al)_2(Si,Al)_4O_{10}(OH)_2$) [8]. The content of Fe, Al, and Si was demonstrated in the sample by spectrographic analysis.

Green earth is the only green pigment to have been used in the picture, and the various shades of green paint contain the pigment in mixture with differing combinations of Naples yellow, white, black, and Prussian blue.

Results of medium analysis by gas-chromatography indicate the use of drying oil, but the palmitate/stearate ratios fall between the expected values for linseed and walnut oils, and so the oil type cannot be assigned without ambiguity, although linseed is the more probable. Linseed oil appears to be the medium of the orange-brown ground layer.

Notes and references

1. Samples were restricted to the edges of the picture, and to the few small damages exposed by cleaning. The picture is in excellent condition.
2. MILLAR, O.N. and MILLER, C.E., *Canaletto: Painting and Drawings,* Catalogue of the exhibition, The Queen's Gallery, Buckingham Palace, 1980 – 81.
3. LEVEY, M., *National Gallery Catalogues: The Seventeenth and Eighteenth Century Italian Schools* (London 1971), p.25.
4. MILLAR, O.N. and MILLER, C.E., *op. cit.,* p.27.
5. The lead white was demonstrated by XRD to be the conventional basic lead carbonate, but of an unusually pure form, with a negligible proportion of the neutral carbonate present.
6. JCPDS file No.18 – 687. Antimony and lead were shown to be present as well as iron, aluminium, silicon and tin. See also Notes 28 – 30, pp.66 – 7.
7. Both the vermilion (JCPDS file No.6 – 256) and lead white (JCPDS file No.13 – 131) were detected by XRD. Initially, because of the strong orange-red component in the sample, the presence of some red lead (lead tetroxide) was suspected, but the XRD result ruled out this possibility.
8. The eight strongest lines in Angstroms of the XRD pattern for glauconite are: **10.1** (100), **4.53** (80), 3.63 (40), 3.33 (60), 3.09 (40), **2.59** (100), 2.40 (60), 1.51 (60). Relative intensities in brackets. See JCPDS file No.9 – 439.

Plate 7 Canaletto, *Venice: The Feastday of S. Roch* (No.937). Photomicrographs of paint cross-sections, photographed in reflected light at 220× magnification; actual magnification on the printed page shown beneath each photomicrograph.

(a) Blue of sky, left-hand edge.

1. Orange-brown ground: earth pigments.
2. Light cream-coloured ground: lead white + brown ochre (or umber).
3. Light grey underlayer for the sky: lead white + charcoal.
4. Blue of sky: Prussian blue + lead white.

(b) Scarlet robe of Cancelliere Grande.

(Orange-brown ground layer missing from sample.)

1. Light cream-coloured ground: as layer 2 in *(a)*.
2. Warm grey underpaint: mainly lead white, but also containing earth pigments, black and in certain samples some red lake pigment.
3. Scarlet robe: thick layer of vermilion of diverse particle size and colour, containing a little lead white.

(c) Mid-green of foliage, swag over church doorway.

(Orange-brown ground layer missing from sample.)

1. Light cream-coloured ground: as layer 2 in *(a)*.
2. Fawn of architecture: earth pigments and white.
3. Shadow of the doorway: mainly earth pigments + black.
4. Green of foliage: green earth (glauconite) + Naples yellow.

(d) Mauve of robe, foreground figures, left.

1. Orange-brown ground: as layer 1 in *(a)*.
2. Light cream-coloured ground: as layer 2 in *(a)*.
3. Warm grey underpaint: as layer 2 in *(b)*.
4. Mauve of robe: charcoal black, red lake + white.

Plate 6 Canaletto, *Venice: The Feastday of S. Roch* (No.937). After cleaning and restoration.

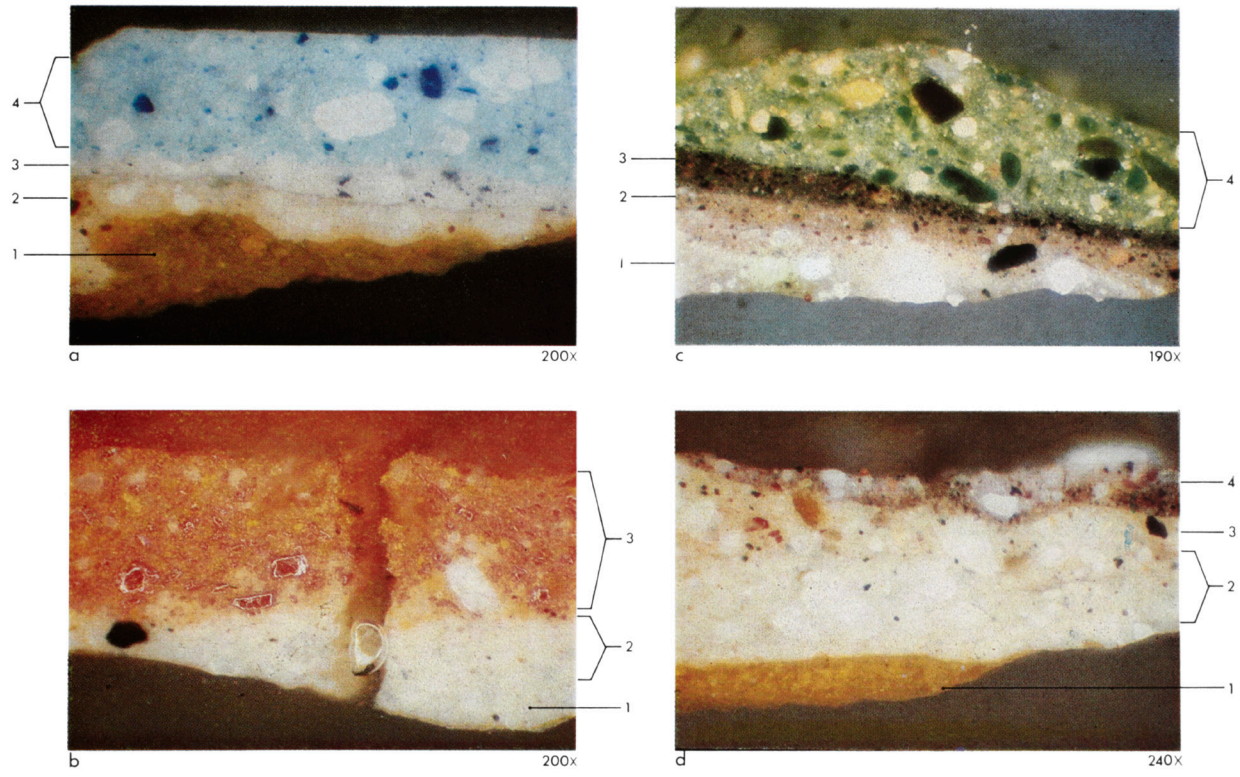

Plate 7 Canaletto, *Venice: The Feastday of S. Roch* (No.937). Photomicrographs of paint cross-sections. Full captions on facing page.