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Interpretation of the X-Ray of du Jardin's 'Portrait of a Young Man'

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Although the existence of another head beneath that in the *Portrait of a Young Man (Self-Portrait?)* by Karel du Jardin (No.1680) (Fig.1 and Plate 1, p.25) has been known since 1955 [1], the recent cleaning and restoration of the painting [2] provided an opportunity for a complete X-radiograph to be made and for samples of the paint and ground to be taken and mounted as cross-sections. These not only supplied information on the paint layers of the two figures which are clearly visible in the X-ray (Fig.2) but also revealed the presence of yet another image, apparently sandwiched between them, all three evidently being by the same artist.

The extremely complicated cross-sections (Plate 2, p.25) that resulted from this re-use of the canvas show that it was originally prepared with the type of double ground often found on seventeenth century paintings which consists of a layer of grey, in this case a mixture of powdered charcoal and lead white [3] in linseed oil [4], over a red-brown layer based on earth pigments. These, like most of the pigments used in the paint layers, are unusually coarsely ground with several large orange particles protruding through all the subsequent paint layers to be easily visible on the surface of the painting [5] (Fig.3).

In the samples taken from the edges of flake losses on the jaw-line and forehead of the topmost figure (Plate 2a and b) the ground has been covered with three separate layers of paint, representing flesh, interspersed with layers of grey priming identical in composition to the upper layer of the original ground [6]. In the first of these samples (Plate 2a) the bottom layer of flesh paint is considerably thicker and paler in colour than the two layers above. Its relative thickness and the fact that it is composed of a few scattered particles of the X-ray opaque pigments vermilion and lead-tin yellow, along with a small amount of azurite, in a matrix of lead white, makes it reasonable to associate this layer with the head looking to the right which is the dominant image in the X-ray, even if its clarity is exaggerated by the rather worn condition of parts of the top paint layer.

That the sitter for the original portrait was probably a woman is suggested by the pale colour of this lowest layer which is very similar in its combination of pigments and appearance under the microscope to samples of flesh paint from Rembrandt's *Saskia van Ulenborch* (No.4930) [7], and quite unlike the mixture of vermilion, charcoal and earth pigments with a much smaller quantity of lead white that is used to achieve the rather florid complexion of the young man in the final painting and is also visible in the intermediate layer of flesh paint belonging to the hidden image. In the second sample (Plate2b) the

bottom layer is very much darker where it probably coincides with the shadow of the modelling of her(?) temple. The two upper layers are again almost identical and the top layer of grey priming may not be continuous, suggesting a possible correlation between the top and middle images.

The identification of the figure looking to the right as a woman is supported by the discovery of the same thickly applied, pale flesh colour in the lowest paint layer of a sample taken from a damaged area of the lace-edged collar (Plate 2c). It also seems to confirm that she is wearing a dress with a fairly low-cut square neckline as indicated in the X-ray.

It is less easy to account for the presence of a rather olive-coloured paint, apparently also flesh, in the second layer. When studying the X-ray it is tempting to imagine a head looking full-face out of the picture, slightly below the heads of the two clear images and on a smaller scale, but the occurrence of the intermediate layer representing flesh in the sample taken from as far up as the top figure's forehead (Plate 2b) seems to rule out this possibility. It is more likely that the second head, and surely it must be a head, was simply a previous attempt at painting the same young man as in the final portrait. This would help to explain why there is no clear image of it in the X-ray. The probability that it was abandoned and covered over with a new priming before the previous ground had been completely covered with paint is suggested by the absence of a layer of paint and grey priming from a sample taken from the brown doublet, just below the lace of the collar (Plate 2d) [8]. The characteristic pale flesh of the supposed female figure is still present as the bottom layer of paint in the section.

The remaining cross-sections were of less assistance in interpreting the confusion of images in the rest of the X-ray. Even when all the areas of X-ray opaque paint connected with the collar and slashed doublet of the top figure are blocked-out from a print of the X-ray, there appear to be more elements of costume than could possibly belong to just two figures, one of which may only have been partially roughed-in.

Samples taken from along or near the bottom edge (for example, Plate 2e) all include a thin film of black pigment as the lower paint layer; but in a section from slightly higher up (Plate 2f) this is replaced by a fairly thick layer of brilliant yellow (lead-tin yellow) which may be part of some form of gold decoration like the buttons or brocade edging to the top figure's doublet. The second paint layer in both these samples consists of a dark blue-green colour, which could also be seen before restoration in the bottom left corner where a few small pieces of the top layer of paint and priming had flaked away.



Figure 1 du Jardin, *Portrait of a Young Man* (No.1680), after cleaning, before restoration. Sample sites are marked a – i. See Plate 2, p.25 for paint cross-sections.



Figure 2 du Jardin, *Portrait of a Young Man* (No.1680), X-ray mosaic. Sample sites are marked a–i. cf.Fig.1.



Of the many puzzling features prominent in the X-ray, it was only possible to establish that the horizontal band coinciding with the tops of the slashes in the sleeve of the uppermost painting belongs to the lowest image and is made up of lead white with a few particles of green and blue pigment (Plate 2g), whereas the pronounced diagonal marks leading out of the picture on the right edge are part of the intermediate image, and are painted with a thick layer of cream-coloured paint (Plate 2h). The thin black layer from the bottom painting, referred to previously, is also present in this section but applied over the same warm grey paint that appears to have been used as the background colour for this lowest portrait. It is visible as the lowest layer of paint in a sample taken from just above the young man's head (Plate 2i), while the background colour chosen for the intermediate painting seems to have been a dull greenish brown.

Unfortunately it was not possible to find suitable points to take samples in order to identify the colour and location in the layer structure of other curious features on the X-ray, such as the curved shape to the left of the heads, and particularly the scalloped pattern which runs across the bottom of the image and also occurs in several places on the left-hand side. Inverting the X-ray or turning it on its side does not seem to

produce any solution to the problem and the interpretation of the images is further complicated by du Jardin having apparently wiped off surplus paint from his brushes onto the unpainted background, producing for example, the whitish swirls and pink vertical lines which show through slightly in the top left- and right-hand corners of the background of the final painting. This habit may also account for the small touches of salmon-pink coloured paint just visible in a gap between the edge of the lace and the brown paint of the doublet, and present in the cross-section taken from this area (Plate 2d).

It should be pointed out that the typical cusped distortions in the canvas weave caused by stretching are only present along the left edge [9], suggesting that the first, or first two, paintings might originally have been larger, and that the canvas was cut down and re-stretched for the subsequent painting(s) when already primed and therefore less likely to be distorted than untreated canvas. The placing of the top portrait makes it unlikely that the canvas has been reduced in size to any extent since the final image was painted. However the same would also apply to the first portrait if it was intended as a single figure and not part of a group portrait or a larger composition.

The examination of this painting using an X-radio-

Figure 3

Detail after cleaning, before restoration. The unusually large pigment particles, including those from the lowest layer of the ground, can be seen. The paint film is slightly worn so that small areas of grey priming have been exposed, especially to the right of the mouth.

graph to guide sampling has produced a great deal of evidence about the artist's re-use of a canvas, but its limitations are shown in that certain aspects cannot be fully resolved. More elaborate methods of X-ray analysis, for example autoradiography by neutron activation [10], might provide additional information about the hidden paintings, while obviously more could be learnt from a further series of cross-sections, but only by taking an unacceptable number of samples from undamaged areas of the painting.

Notes and references

1. Originally only two X-ray plates (of the head and of the area immediately below it) were taken and they indicated little more than the presence of the second head. See MACLAREN, N., *National Gallery Catalogues: The Dutch School* (London 1960), pp.203 – 4.

2. Cleaning revealed the painting to be in fairly good condition. There are a few quite large damages along the top edge and a number of smaller flake losses scattered over the figure and background. Some areas of paint are rather rubbed and worn. The suspect signature (see MACLAREN, *op. cit.*, p.204) proved to be false and was removed with the varnish and old retouchings.

3. For a scanning electron micrograph of particles of charcoal from the ground of this painting, and further discussion of some of the samples, see PLESTERS, J., BOMFORD, D. and ROY, A., 'Interpretation of the Magnified Image of Paint Surfaces and Samples in Terms of Condition and Appearance of the Picture', *Preprints of the Contributions to the Washington DC Congress of the International Institute for Conservation*, 3 – 9 September (1982).

4. Identified by gas-chromatography. Linseed oil is the medium used throughout the picture.

5. Other notable examples of double grounds on seventeenth century paintings in the National Gallery include Van Dyck's 'Equestrian Portrait of Charles I' (No.1172), Claude's 'Seaport: The Embarkation of the Queen of Sheba' (No.14; a cross-section is illustrated in the *National Gallery Technical Bulletin*, 4 (1980) p.21), and the unfinished 'Three Men and a Boy' (No.4837) by a follower of the Lenain with its large areas of unpainted ground.

There are contemporary instructions for the preparation of these grounds in the 'de Mayerne manuscript' (ed. Van de Graaf, J.A., *Het de Mayerne Manuscript als bron voor de Schildertechniek van de Barok* (Utrecht 1958), p.138), and in a French treatise by Félibien whose directions on canvas preparation correspond remarkably closely to the methods that appear to have been used by du Jardin: 'On choisit du coutil, ou de la toile la plus unie, & lorsqu'elle est bien tendue sur un chassis, l'on y donne une couche d'eau de colle, & après on passe par dessus une pierre ponce pour en oster les noeuds. L'eau de colle sert à coucher tous les petits fils sur la toile, & remplir les petits trous, afin que la couleur ne passe pas au travers. Quand la toile est bien seche, on l'imprime d'une couleur qui ne fasse point mourir les autres couleurs, comme du Brun rouge qui est une terre naturelle qui a

du corps, & qui subsiste, & avec lequel on mesle quelquefois un peu de blanc de plomb, pour le faire plutost secher. Cette imprimeure se fait après que la couleur est broyée avec de l'huile de noix, ou de lin; & pour la coucher la moins epaisse que l'on peut, on prend un grand cousteau propre pour cela. Quand cette couleur est seche, on passe encore la pierre ponce par dessus pour la rendre plus unie; puis l'on fait, si l'on veut, une seconde imprimeure composée de blanc de plomb, & d'un peu de noir de charbon, pour rendre le fond grisastre [. . .].' (FÉLIBIEN, M., *Des Principes de l'Architecture, de la Sculpture, de la Peinture*, 3rd ed. (Paris 1697), p.297); I am grateful to Joyce Plesters for drawing my attention to this treatise.

The exact reason for these double grounds is not clear, other than the fact that the earth pigments are basically stable and compatible with other pigments (as pointed out by Félibien) and may have been slightly cheaper than lead white and therefore used to fill the interstices of the canvas weave. They cannot have had any optical significance, since the grey priming is sufficiently opaque to block-out all the warmth of the colour beneath. See also PLESTERS, BOMFORD and ROY, *op. cit.*

6. In re-priming his canvas after each unsuccessful painting, du Jardin differs from Goya who painted his portrait of 'Doña Isabel de Porcel' (No.1473) directly on top of a male portrait. See WYLD, M., 'Goya's Re-use of a Canvas for Doña Isabel', *National Gallery Technical Bulletin*, 5 (1981), p.38.

7. A sample taken from the pale flesh of Saskia's thumb contained the same rather unusual combination of vermilion and azurite in lead white, but the lead-tin yellow found in the du Jardin sample is not present.

8. A layer of paint and grey priming is also missing from a cross-section (not illustrated) from the yellow trimming along the front opening of the doublet but, as the sample came from the very edge of the painting, it can probably be discounted.

9. The original canvas turnover edges have not survived.

10. See SAYRE, E.V. and LECHTMAN, H.N., 'Neutron Activation Autoradiography of Oil Paintings', *Studies in Conservation*, 13, 4 (1968), pp.161 – 85.

Plate 2 du Jardin, *Portrait of a Young Man (Self-Portrait?)* (No. 1680).

Photomicrographs of paint cross-sections, photographed in reflected light at 220× magnification; actual magnification on the printed page shown beneath each photomicrograph.

All the cross-sections show the double oil ground comprising a reddish brown ochre underlayer with an upper layer of charcoal and lead white (layers 1 and 2 in *a-i*). The paint of the first portrait (probably female) lies directly on the first grey priming (layer 2). The painter then obliterated this image with a new grey priming (layer 4 in *a-g, i*; layer 5 in *h*), and painted a second image, possibly also a portrait. The second painting is represented by layer 5 (*a-g, i*) and layer 6 (*h*). A third discontinuous grey priming (layer 6 in *a-c, e-g, i*) lies beneath the paint of the male sitter at the surface. For reasons suggested in the text, the final priming is absent from cross-sections (*d*) and (*h*) (see p.25).

The descriptions of sample sites given below relate to the surface (male) portrait. The sample points are also marked on Figs. 1 and 2 (pp.20–21).

(a) Brownish shadow of man's jaw-line.

1. Red-brown ochre ground.
2. First grey priming: charcoal + lead white.
3. Pale flesh of first portrait (probably a woman): lead white + small quantities of vermilion, azurite and lead-tin yellow.
4. Second grey priming: lead white + charcoal. Less black pigment than in layer 2.
5. Layer probably representing flesh of an intermediate portrait: lead white, brown earths + traces of charcoal and vermilion.
6. Third grey priming: charcoal + lead white. Rather more black pigment than in layer 4.
7. Shadow of man's jaw: principally earth pigments, charcoal + lead white.

(b) Highlight on man's flesh, on bridge of his nose.

- 1,2. Double ground.
3. Shadow of flesh on eyebrow or temple (female portrait): lead white, brown earth pigments + small quantities of vermilion and lead-tin yellow.
4. Second grey priming.
5. Flesh (intermediate portrait): white + traces of vermilion and charcoal.
6. Third grey priming.
7. Highlight on man's flesh: mainly white, but with small quantities of fine vermilion and red earth.

(c) Cool, very light grey of lace collar.

- 1,2. Double ground.
3. Pale flesh of neck (female portrait): as layer 3 in (*a*).
4. Second grey priming.
5. Shadow of flesh (intermediate portrait): similar to layer 5 in (*a*).
6. Third grey priming. A very large charcoal particle showing residual cell structure is visible.
7. Cool grey of lace collar: mainly lead white, some charcoal.

(d) Brown of doublet.

- 1,2. Double ground.
3. Pale flesh of mid-chest (female portrait): as layer 3 in (*a*).
4. Second grey priming.
5. Pinkish flesh (intermediate portrait): white, finely ground vermilion + trace of black.
6. Brown doublet: brown earth, charcoal and lead white.

(No third priming is present in this section.)

(e) Black background, bottom left corner.

- 1,2. Double ground.
3. Thin black layer (costume? for female portrait): mainly charcoal.
4. Second grey priming.
5. Dull blue-green (background or costume? for intermediate portrait): smalt + trace of azurite or blue verditer, possibly in a matrix of a yellow glazing pigment.
6. Third grey priming.
7. Black background: mainly charcoal.

(f) Brown of doublet, near lower edge.

- 1,2. Double ground.
3. Yellow of costume? (female portrait): lead-tin yellow.
4. Second grey priming.
5. Dark blue-green background or costume? (intermediate portrait): azurite or blue verditer, smalt, charcoal + a little white. There may also be a yellow glazing pigment in the layer.
6. Third grey priming with a few scattered earth pigment particles.
7. Brown doublet: as layer 6 in (*d*).

(The sample has a lateral cleavage between layers 2 and 3.)

(g) Pale yellow of slash in sleeve.

- 1,2. Double ground.
3. Horizontal band seen in X-ray: mainly white pigment with traces of blue, green and red.
4. Second grey priming.
5. Dark blue-green background or costume? (intermediate portrait): as layer 5 in (*f*).
6. Third grey priming.
7. Pale yellow slash in sleeve: white, charcoal + brown earth, with a yellow glaze at the surface.

(h) Black background, right-hand corner.

- 1,2. Double ground.
3. Warm grey background (female portrait): finely-divided black, mixed with white, traces of vermilion and lead-tin yellow.
4. Black costume? (female portrait): finely-divided black pigment.
5. Second grey priming.
6. Thick cream layer, visible on the X-ray as diagonal bands at the right-hand edge of the picture (intermediate portrait): lead white with a few scattered coloured pigment particles.
7. Black background: charcoal.

(No third priming is present in this section. See also (*d*) above.)

(i) Grey-green background, left and slightly above man's head.

- 1,2. Double ground.
3. Warm grey background (female portrait): as layer 3 in (*h*).
4. Second grey priming.
5. Dull greenish brown background (intermediate portrait): mainly yellow and brown earths with some charcoal. Some copper green pigment is present in the lower part of the layer.
6. Third grey priming.
7. Dull grey-green background: yellow earth + charcoal.

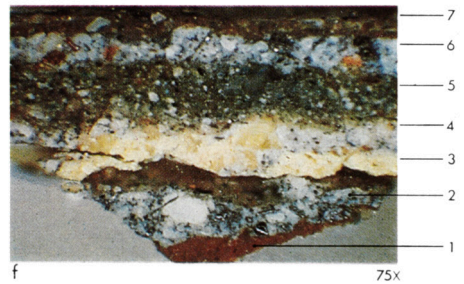
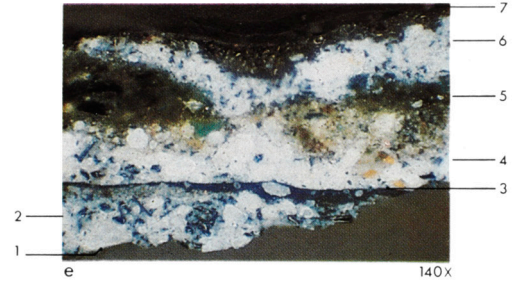


Plate 1 du Jardin, *Portrait of a Young Man (Self-Portrait?)* (No.1680).
After cleaning and restoration.

Plate 2 du Jardin, *Portrait of a Young Man (Self-Portrait?)* (No.1680).
Photomicrographs of paint cross-sections.
Full caption on facing page.

