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# The Technique of a 'Tüchlein' by Quinten Massys

Ashok Roy

A recent technical examination of a picture by Dieric Bouts in glue tempera medium on linen has heightened our interest in the techniques employed for this rare form of painting, and we have been prompted to see whether some of the unusual features recorded in that painting are reflected in other examples of *Tüchlein*. Our study of the Bouts *Entombment* (No.664) was published in an earlier volume of this *Bulletin* [1], and there the emphasis had been to compare the technique of the canvas painting with that of a small work in oil on panel, also by Bouts. Since then there has been some general interest in the history, origin and function of Early Netherlandish canvas painting [2], although rather little appears to be known in detail about their construction. An immediate difficulty is that because of their great inherent fragility few examples survive to be studied. Of those that have survived many are severely damaged, or have been reduced to an unrecognizable state by a layer of varnish that has destroyed the matt quality of the paint surface on which the unique character of *Tüchlein* relies.

We are fortunate enough to have in the Collection a second example of an Early Netherlandish painting on canvas: *The Virgin and Child with SS.Barbara(?) and Catherine* (No.3664; Fig.2 and Plate 7, p.40), attributed to Quinten Massys [3]. Like the Bouts *Entombment*, No.3664 is painted with animal glue as the binding medium for the paint layer, although the condition as a whole is less good. The Massys has been lined but never varnished and, although the paint is badly abraded in places and the picture has been cut (see the X-

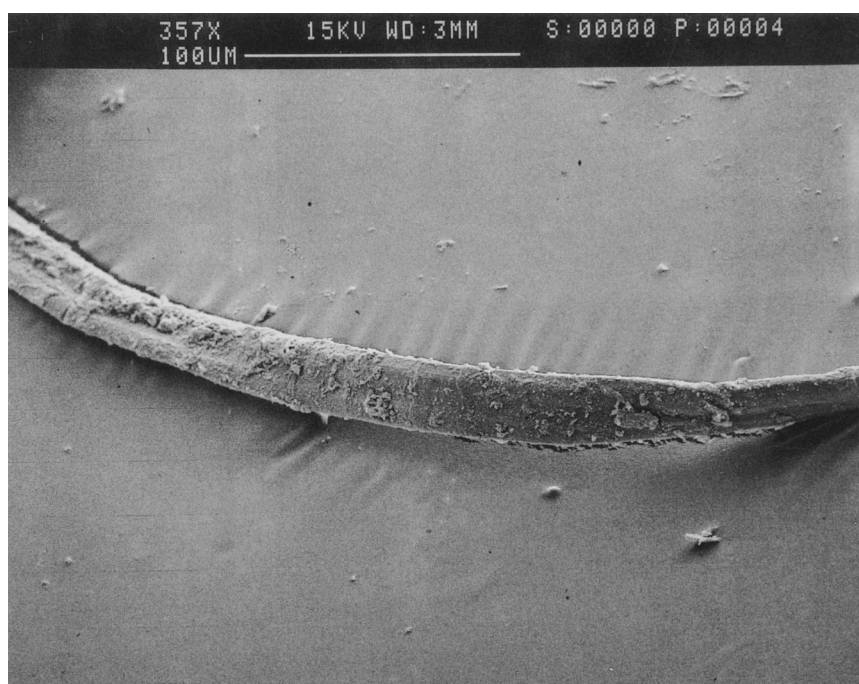
radiograph, Fig.3), much of the composition and its quality can still be appreciated [4]. The Massys *Virgin and Child* must be some decades later in date than the Bouts *Entombment* and their functions would have differed since the earlier picture evidently formed part of a complex [5], although it might be expected that the method of painting of the two and their range of pigments would be comparable. We note here the results of examination of a series of samples from the Massys with some comparisons drawn from the earlier investigation.

## Support

The Massys *Virgin and Child* is painted on a canvas identified as linen (flax) by examination under the optical microscope of fibres unravelled from a thread at the edge. In the scanning electron microscope (SEM) the fibres appear as slightly twisted ribbons in which the usual rounded cross-section of flax has been lost, probably by collapse with age of the inner part of the fibre wall (see Fig.1). This is precisely the degraded form of the fibres, also flax, we observed in the Bouts canvas [6]. The support itself of the Massys is of a plain weave at the coarser end of the scale for paintings of this type [7].

It has been suggested that the canvases would have been nailed or laced to a frame, or laid out on woollen blankets before painting [8]. On the Massys there is just discernible an irregular line of possible nail holes that follow the distortion of the canvas weave along the top edge of the picture. The other edges show no signs of

**Figure 1** SEM micrograph of a single fibre from the canvas of Massys (No.3664). Note the unusual twisted and flattened conformation for flax. Gold-coated, 357 $\times$ .



**Figure 2**  
Quinten Massys,  
*The Virgin and  
Child with SS.  
Barbara(?) and  
Catherine*  
(No.3664).  
Glue tempera on  
canvas,  
92.7 × 110 cm.



**Figure 3**  
Quinten Massys,  
*The Virgin and  
Child with SS.  
Barbara(?) and  
Catherine*,  
X-radiograph of  
the whole.





how the canvas might originally have been stretched, and there is no painted border, as occurs in the Bouts *Entombment*, to indicate the limits of the composition.

### Ground or priming

The Bouts *Entombment* has no conventional ground layer; the glue tempera paint was applied directly to the sized canvas. Similarly in the Massys there appears to be no true ground layer, and where the paint is severely abraded and the bare canvas beneath revealed, there seems rather little evidence of a separate layer of glue size. However, under intact original paint, the canvas fibres appear to be impregnated with darkened animal glue, although it cannot be determined whether this is the original priming, or has penetrated during lining. Glue has also been injected in the past to lay areas of flaking paint [9]. On balance however, an initial coating of the canvas with glue size seems probable and is mentioned in the early literature [10].

### Underdrawing

The infra-red photograph (Figs. 4 and 5) shows some evidence of underdrawing of a light, tentative nature, seen most clearly to suggest the position of the Child and

the hanging folds of the Virgin's headdress, but there is no sign of a drawn-in design beneath the worn patterned backcloth to the throne. Lightly sketched lines are visible elsewhere in infra-red, for example in the outlines of S. Barbara's face and hands as well as the Virgin's hands, but the entire drawing, presumably made directly onto the sized canvas, cannot have been very complete—at most an outline indication of the main forms and positions. The soft sketchy lines that are apparent in infra-red suggest a simple drawing in liquid paint rather than the use of a dry material such as charcoal or black chalk. That there should be any kind of underdrawing at all on a canvas painting without a ground is surprising.

The infra-red photograph shows more than this cursory true underdrawing. There are broad dark wedges caused by an infra-red absorbing material beneath the deepest green shadow area of the folds of the Virgin's robe, and cross-sections confirm a solid layer of black paint underneath the surface layer for the drapery (see below). The same continuous layer of black also occurs in the shadows of the dark blue of S. Catherine's dress (Plate 9a, p.40), although there an azurite-containing upper layer conceals its presence in infra-red. In some places this dark layer has been left uncovered and forms the surface paint. It seems that parts of the darkest tones of the draperies were underpainted in solid

**Figure 4**  
Quinten  
Massys,  
*The Virgin and  
Child with SS.  
Barbara(?) and  
Catherine*,  
infra-red  
photograph  
of the whole.

black before the colour layer was applied, both to suggest the position of the shadows as well as to provide depth of colour to the overlying blue and green paint. This system is quite distinct from panel painting in which the modelling of the draperies is generally worked from light to dark.

A third factor serves to confuse interpretation of the extent of underdrawing in infra-red. Some of the halftones of the draperies, particularly of the Virgin's robe, have been emphasized in fine black hatching strokes laid with a brush onto the surface of the colour layer (see Plate 8, p. 40). These are most noticeable in the folds of drapery around the Virgin's cuff, and follow sections of the lower part of the robe. S. Catherine's dark reddish brown sleeve seems also to suggest this quite complex method of underpainting and shadowing, with solid black beneath the folds, and shading at the surface as well. In a small panel painting by Massys, *The Virgin and Child Enthroned, with Four Angels* (No. 6282), there is also the most complex and careful hatched detailing of line and shadow in black on the surface of the gilded

architectural setting for the Virgin's throne (Fig. 6). The technique of shading the surface with fine dark lines features in other Early Netherlandish School paintings [11], including the Bouts *Entombment* where the pale green foreground landscape has hints of shadow suggested in this way. Much lighter, less extensive hatching in brown paint is used for detail in the painting of the hands in No. 3664.

### Paint medium

The characterizing binding medium for *Tüchlein* is aqueous; usually it is animal glue. The present Massys shows all the indications of glue tempera: the paint film is flat and opaque even where pigments of low refractive index have been used, the medium can be extracted in hot water, and tests on samples with protein-sensitive stains such as acid fuchsin and amido black give strong positive results. This suggests the same animal glue medium found by analysis for the Bouts *Entombment* [12].

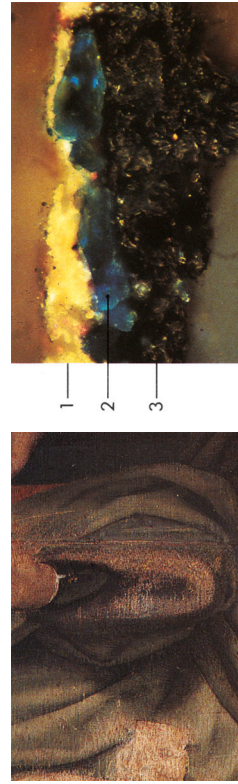
**Figure 5**  
Infra-red detail of the Child showing light underdrawing on the canvas support.



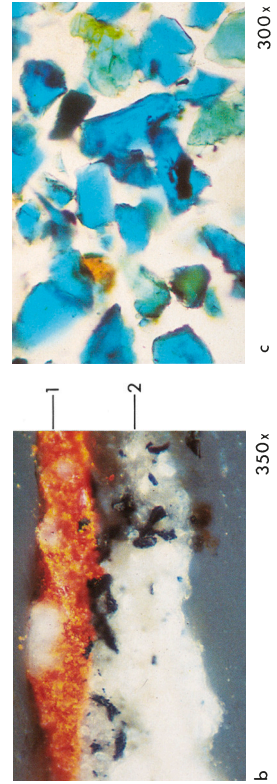


**Plates 4 and 5** (Far left and left) Martin van Heemskerck (Nos. 6508a and 6508b), reverses, after cleaning and restoration.

**Plate 7 (Right)** Massys, *The Virgin and Child with SS. Barbara(?) and Catherine* (No. 3664).



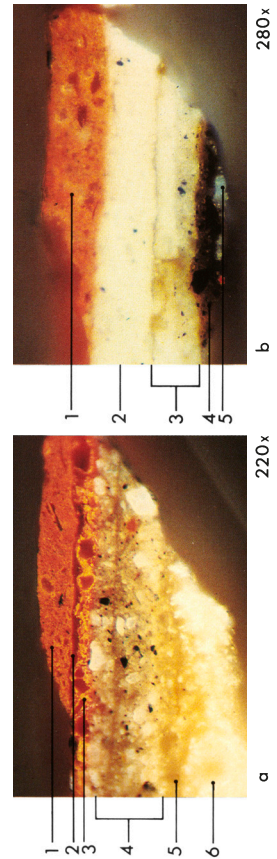
**Plate 8 (Right)** Massys (No. 3664), detail of hatched shading on the Virgin's robe.



**Plate 9** Massys (No. 3664), paint samples. Full caption on facing page.



**Plate 6** Martin van Heemskerck, paint cross-sections from reverses. Full caption on facing page.



**Plate 6** Martin van Heemskerck, samples from the coats-of-arms on the reverses of the panels shown in Plates 1 and 2, p.33. Photomicrographs of paint cross-sections photographed in reflected light under the microscope at 220× (a) and 320× (b). Actual magnifications of the printed page shown opposite.

(a) Red background of the coat-of-arms on the reverse of No.6508a, before removal of overpaint.

1. Red iron oxide overpaint.
2. Thin glaze of pure red lake on the original red background.
3. Red underpaint containing red lake and vermilion.
4. Layers of grey modelling of the podium beneath the coat-of-arms, containing a mixture of lead white, charcoal and second vegetable black, with iron oxide red.
5. *Imprimatura*, here consisting mostly of lead white and medium.
6. Chalk ground.

(b) Pale grey background to the coat-of-arms on the reverse of No.6508b, before removal of overpaint.

1. Red iron oxide overpaint layer.
2. Pale grey of background to the coat-of-arms, containing lead white and a few black particles.
3. Layers of modelling of the podium beneath the shield containing lead white, charcoal and a second vegetable black in varying proportions.
4. Dark *imprimatura* layer containing mostly black, with a few iron oxide particles.
5. Trace of chalk ground.

**Plate 9** Massys, *The Virgin and Child with SS. Barbara(?) and Catherine* (No.3664). Photomicrographs of paint cross-sections (a, b) and a dispersed sample (c), photographed at 600× under the microscope. Reflected light for (a, b); transmitted light for (c). Actual magnifications on the printed page shown opposite.

(a) Yellow-brown highlight of pattern on S. Catherine's dress.

1. Highlight of lead-tin yellow with a little red and yellow-brown earth.
2. Body colour of the dress: coarsely-ground natural azurite.
3. Thick undermodelling of carbon black.

(b) Red highlight on S. Catherine's sleeve.

1. Vermilion highlight.
2. Grey of apron: lead white with wood charcoal.

(c) Dispersed deep blue-green of S. Catherine's dress by transmitted light. Principally coarsely-ground natural azurite incorporating a little green malachite.

## Pigments and layer structure

Perhaps the most striking difference between the Bouts and the Massys canvas paintings is the presence of a true layer structure in the paint of the latter. In this the Massys is closer in technique to contemporary pictures in oil media, some of which may also have been painted on canvas supports [13]. Several of the paint cross-sections from the Massys show a sharp division between layers of separate colour indicating that the paint had dried thoroughly between successive applications (see Plates 9a and 9b, p.40). The flesh, however, is thinly and flatly painted, substantially in a single layer with the features and shadows drawn across the surface and blended into the surrounding paint.

### *The draperies*

An extraordinary result of the examination of the Bouts *Entombment* was the finding of a mixture of azurite, natural ultramarine and smalt mixed together for the thick, crusty deep blue paint of Nicodemus's collar [14]. The dark paint of S. Catherine's brocade dress in the Massys is very similar in colour and texture, but the pigment is almost entirely natural azurite of large particle size, containing in the greener areas some natural malachite [15] (Plate 9c, p.40). Ultramarine and smalt [16] are lacking. The deep blue of the dress is painted as a single thick layer of colour over the black paint referred to above [17], with the yellow and brown design of the brocade pattern applied directly on top (Plate 9a, p.40). The design itself is made in a yellow-brown earth [18] with highlights of lead-tin yellow 'type I' [19]. Clearly some form of stencil must have been used to lay the patterns on the dresses worn by the two saints, since in both examples the repeating design is applied without reference to the folds in the draperies beneath.

X-ray diffraction has also shown the use of lead-tin yellow 'type I', the more usual variety, in the surviving paint of S. Catherine's cloak, and in the freely painted design for the throne backcloth. In each case its presence faintly registers on the X-radiograph (Fig.2).

The Virgin's dress and mantle are a curious and unusual colour. The rather harsh mid-green shade is unlike any of the common pure green pigments available in the sixteenth century, nor is it close to possible mixtures of blue and yellow pigment that might have been used. In fact the only coloured pigment employed is azurite, but of a pale greenish blue tone. The lightest sections contain azurite mixed with lead white, but discoloration of the paint medium and the presence of a significant proportion of brown cuprite as an impurity, combined with a blue pigment of relatively small particle size and poor colour, together lend the paint quite a strong, cold greenish cast. It seems likely that a pale blue was originally intended, and that these various factors have distorted the colour we now see. Surprisingly, unlike the bluer parts of S. Catherine's dress, no malachite is present in the greenish paint of the Virgin's drapery. The use of a black underpaint for the shadows has already been noted, as well as fine hatching in black on the folds of the overmantle. These strokes to express shading on the green cloth comprise a carbon black of fine and coarser particles suspended in a matrix of red



lake pigment, lending warmth to the dark lines. The same technique is used for S. Barbara's broad collar, in which the black pigment is combined both with red lake and some red earth, again to denote depth and richness of colour for the material, perhaps velvet.

The deep burgundy of S. Catherine's sleeve and S. Barbara's patterned dress have been shown by EDX analysis to contain dark red natural earth pigments, very finely ground. For the sleeve the body colour of red earth passes over a layer of black in the shadows, with a scumble of charcoal drawn over the surface for extra emphasis. The narrow highlight along the lower edge of the sleeve is a layer of vermilion, somewhat discoloured, over the grey paint of the saint's fur-trimmed apron, but here there is no intermediate layer of red earth (see Plate 9b, p.40). S. Barbara's dress is similar except that strokes of vermilion highlight defining the back of the skirt pass over the red earth underlayer, and in turn have been shaded with a red lake glaze. Microscopically the surface glaze has a moderate translucency despite the glue medium employed. Although in the Bouts *Entombment* red lake glazes were used for the draperies, earth pigments were found in only the most limited contexts [20].

The greyish apron of S. Catherine's dress might be read as a white layer that has discoloured. It is clear from the X-radiograph that the paint contains much lead white, and this has been confirmed by X-ray diffraction of a sample [21]. Formation of black lead sulphide where lead white is used in an aqueous medium seems a possibility, but here a cool silvery grey is genuinely meant, since a sample shows the incorporation of wood charcoal in the white (see Plate 9b, p.40).

#### *The paint of the flesh*

An interesting feature of the Bouts *Entombment* is the use of chalk as the principal pigment for the flesh tints, with only the highlights strengthened with lead white. Chalk was also detected in the draperies and elsewhere [22], and proves to be a perfectly adequate pigment on its own in glue medium. The areas containing chalk are readily distinguished in the X-radiograph from those with a content of lead white, and Bouts's careful modelling of the flesh paint can clearly be seen [23]. The Massys, however, is quite different. The areas of flesh painting appear flat and relatively unmodelled in the radiograph (Figs. 3 and 7), and evidently contain a good deal of lead white pigment. The main component of lead white has been confirmed by X-ray diffraction analysis of a sample of original paint from the Virgin's neck, with no admixture of chalk detectable in the powder pattern. In this and two other samples, from S. Catherine's cheek and from the flesh paint concealed beneath S. Barbara's black collar, the tinting pigments are red earth, vermilion, red lake and charcoal black, used in changing proportions to achieve the various flesh tones [24].

**Figure 6** (Right, top) Quentin Massys, *The Virgin and Child Enthroned with Four Angels* (No.6282), panel. Detail showing hatching and shading in black on the gilded background.

**Figure 7** (Right) X-radiograph detail of the Child and S. Catherine.



## Notes and references

1. BOMFORD, D., ROY, A. and SMITH, A., 'The Techniques of Dieric Bouts: Two Paintings Contrasted', *National Gallery Technical Bulletin*, **10** (1986), pp.39–57.
2. WOLFTHAL, D., 'The Technique of Early Netherlandish Canvas Painting', in *Preprints of ICOM Committee for Conservation*, 8th Triennial Meeting, Sydney, Australia, Vol.1 (1987), pp.119–22.
3. DAVIES, M., *The Early Netherlandish School, National Gallery Catalogues*, 3rd edition (London 1968), pp.89–90.
4. The main damage to the picture is wearing and paint loss in the Virgin's cloak, S. Catherine's cape, S. Barbara's hanging sleeve, the backcloth to the throne and sections of the background particularly to the left. There is wearing in the flesh of all the figures, as well as old retouchings which no longer successfully match the original paint in colour and texture. The paint is also evidently discoloured through darkening of the glue binding medium, and there is a surface dirt film which further distorts the original colours. The canvas shows two vertical cuts, one through the Child's head running the entire height of the picture, the other from the lower edge through the Virgin's hand finishing just below her shoulder. There are also four slender triangles of missing canvas running horizontally from this shorter cut. The canvas had been lined or relined in the nineteenth century to reinforce the whole structure. The origin of the cuts in the canvas may relate to the painting having been folded at some stage, and sliced to remove the creases in paint and support before it was re-backed.
5. The function of the Bouts 'Entombment' and its associated pictures is described by Alistair Smith in BOMFORD, D., ROY, A. and SMITH, A., *op. cit.*, pp.39–41.
6. *ibid.*, pp.44–5 and Figs. 9a and 9b, p.44.
7. The thread count for Massys No.3664 taken from the X-radiograph gave an average of 14 threads/cm in both vertical and horizontal directions. For Bouts No.664 the count was an average of 21 threads/cm for the vertical threads and  $19\frac{1}{2}$  for the horizontal. WOLFTHAL, D., *op. cit.*, p.119, gives the range from 13 to 40 threads/cm for *Tüchlein*.
8. *ibid.*, p.119.
9. The National Gallery 'Conservation Record' notes blister-laying in 1938 and 1969.
10. WOLFTHAL, D., *op. cit.*, p.119.
11. For example, parallel hatching in black on the Virgin's robe in Gerard David's 'Madonna and Child with Angels' (Metropolitan Museum of Art, New York). Dr Maryan Ainsworth, personal communication.
12. BOMFORD, D., ROY, A. and SMITH, A., *op. cit.*, p.47 and Note 10, p.57.
13. WOLFTHAL, D., *op. cit.*, p.119.
14. BOMFORD, D., ROY, A. and SMITH, A., *op. cit.*, p.50 and Plate 6b, p.55.
15. It is not certain whether the malachite is a deliberately added component of the blue, or arises from the source of azurite ground as a pigment. Occasional particles of malachite are sometimes seen in azurite-containing paints, but rarely in this quantity.
16. Smalt has also been identified in a *Tüchlein* by P. Bruegel. See PHILLIPPOT, A., GOETGHEBEUR, N. and GUISLAIN-WITTERMANN, R., 'L'Adoration des Mages de Bruegel au Musée des Beaux-Arts de Bruxelles', *Bulletin de l'Institut Royal du Patrimoine Artistique*, **11** (Brussels 1969), p.8.
17. There is a solid black underpaint beneath a layer of azurite for the very dark, almost black paint of the edge strips to the throne backcloth. In one sample there was also a scumble of black on the surface.
18. EDX analysis showed the presence of iron, silicon, aluminium, calcium and some lead in a sample.
19. Found by X-ray diffraction, see JCPDS file No.11–233 and KÜHN, H., 'Lead-tin Yellow', *Studies in Conservation*, **13**, 1 (1968), pp. 7–33.
20. Earth pigments of various types were found in the painted border to the composition in Bouts No.664 and in some of the more sombre colours. See BOMFORD, D., ROY, A. and SMITH, A., *op. cit.*, p.51.
21. Basic lead carbonate; JCPDS file No.13–131.
22. BOMFORD, D., ROY, A. and SMITH, A., *op. cit.*, p.49.
23. *ibid.*, Figs. 13a and 13b, p.48 and p.49.
24. EDX analysis of several of the flesh paint samples showed the main component to be lead with lesser quantities of iron and the elements associated with natural earth pigments, mainly silicon and aluminium. Vermilion and charcoal were detectable microscopically.