

National Gallery Technical Bulletin

Volume 3, 1979

Published by Order of the Trustees,
Publications Department, National Gallery,
London

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Designed by James Shurmer

Printed by Henry Stone & Son (Printers) Ltd, Banbury, Oxon.

Analyses of Paint Media

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We present here some further analyses of the paint media of National Gallery paintings. Like our earlier results [1–3] they are based on gas-chromatographic examination of the fatty acid content of the samples. In most cases the results are unambiguous and unsurprising and tend to confirm trends noted before, notably the use of walnut oil in the earlier Italian oil painting and its replacement by linseed oil as the sixteenth century progressed.

Notes to the Table

1. The samples taken from this extremely thinly painted picture could only be very small. While the first two samples appeared to be essentially egg tempera, possibly contaminated with oil from later additions as with the Bellini, *Blood of the Redeemer* reported before [3], the green paint was apparently in oil. The distribution of these media in the layer structure has not, however, been checked by staining.
2. This picture was considerably overpainted. The original appears to be entirely in walnut oil. Blue repaints in the sky and in the Virgin's dress were found to have been carried out in egg tempera while a sample of brown paint from S. Michael's shield consisting probably of both original and repaint contained both egg and oil. The only other painting by Perugino which has been examined for its medium, the *Combat of Love and Chastity* (Musée du Louvre) painted for the *Studiolo* of Isabella d'Este, is reported to be in egg tempera with any upper layers in oil [4].
3. While the black paint of the man's hat was original and in oil, his black robe was found to be extensively overpainted in a medium which contained egg fats but no oil, and also a considerable proportion of pine resin (strong peak in the position of methyl dehydroabietate on the chromatogram). This corresponds to a repaint medium which has been found in other nineteenth century repaints on some National Gallery pictures notably one by Garofalo [1]. Blue paint of sky on an added strip along the top of the painting was found to be in egg tempera.
4. The discoloured blue-green colour of this paint initially suggested the possible presence of smalt. However the pigment was in fact bright blue ultramarine thinly dispersed in a matrix of yellowed linseed oil which caused the discolouration.
5. These two paintings are more fully discussed elsewhere in this *Bulletin* (see p.3ff.). Both are in linseed oil in common with other Tintoretto samples analysed [1].

6. Pine resin (methyl dehydroabietate observed on the chromatogram) was found in this sample but its significance is not apparent.

7. This painting is discussed more fully elsewhere in this *Bulletin* (see p.51ff.). The resin found in Sample 2 probably represents residues of old varnish which often tends to penetrate and discolour azurite-containing paint layers, especially the dark blues of the Virgin's robe.

8. The samples examined were paint fragments collected from the floor after this painting had been attacked and damaged by a visitor. Consequently they cannot be located precisely on the painting.

9. These ratios seem sufficiently different for one to believe that two different oils were used in the painting. We had hoped to encounter poppy oil once again in the whites as with the painting by Drouais reported before [3]. Too few samples were examined for general conclusions to be drawn regarding the use of the two oils.

10. The medium here could be either walnut oil or a mixture of linseed and poppy oils. Similar P/S ratios (3.0, 3.9, 3.4) were reported with samples from two other paintings by Manet, the *Déjeuner sur l'herbe* and *Le Balcon* (Musée du Louvre) [5].

References

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5. DELBOURGO, S. and RIOUX, J-P., 'Manière et Matière des impressionnistes. Contribution à l'étude de la matière picturale', *Annales du Laboratoire de Recherche des Musées de France* (1974), pp.34–42.

Artist	Picture	Date	Sample	Medium	P/S	Oil type	Note
Giovanni Battista Cima	Virgin and Child with a Goldfinch No.634	Early 16th cent.	1. Brown-red at bottom of picture	Egg + some oil			1
			2. Blue mountains, upper L.H.S.	Egg + some oil			
			3. Green leaves, lower R.H.S.	Mostly oil, perhaps some egg			
Pietro Perugino	Virgin and Child with SS. Raphael and Michael No.288	c.1499	1. Green of Tobias's tunic	Oil	2.9	Walnut	2
			2. Blue of S. Raphael's robe	Oil	3.2	Walnut	
			3. Pale sky blue, centre panel	Oil	3.0	Walnut	
			4. Blue Virgin's robe	Oil	2.8	Walnut	
			5. Red of S. Raphael's mantle	Oil	2.7	Walnut	
Lorenzo Lotto	Virgin and Child with SS. Jerome and Anthony of Padua No.2281	1520s?	1. Red-brown strip L.H. edge	Oil	2.6	Walnut	
			2. Red of Virgin's sleeve	Oil	2.5	Walnut	
			3. Black shadow of rocks	Oil	2.5	Walnut	
			4. Dark blue of Virgin's robe	Oil	2.8	Walnut	
			5. Flesh of S. Anthony's hand	Oil	2.5	Walnut	
			6. Dark green drape, top right	Oil	2.0	?	
	Family Group No.1047	1547?	1. Black of man's hat	Oil	1.8	Linseed	3
			2. Woman's white cuff	Oil	2.8	Walnut	
			3. Red of carpet	Oil	2.5	Walnut	
			4. Blue of sky	Oil	2.3	Walnut	
Palma Giovane	Mars and Venus No.1866	1580s?	1. Venus's right shoulder	Oil	1.4	Linseed	
			2. Red drape	Oil	1.3	Linseed	
			3. White sheet	Oil	1.35	Linseed	
			4. Blue-green bed cover	Oil	1.25	Linseed	
Jacopo Tintoretto	Christ Washing His Disciples' Feet No.1130	Late 1550s?	1. White impasto	Oil	1.3	Linseed	5
			2. Brown-red flesh	Oil	1.4	Linseed	
			3. Red lake glaze	Oil	1.4	Linseed	
	Portrait of Vincenzo Morosini No.4004	1580s	1. Red lake glaze	Oil	1.6	Linseed	6
			2. Blue mountains	Oil (+ resin)	1.8	Linseed	
			3. White ermine	Oil	1.6	Linseed	
Gerard David	Virgin and Child with SS. and Donor No.1432	1500s	1. Green foliage R.H.S.	Oil	1.7	Linseed	7
			2. Blue Virgin's robe	Oil (+ resin)	1.7	Linseed	
			3. Brick-red column	Oil	1.4	Linseed	
			4. Blue sky, top	Oil	1.9	Linseed	
			5. White cloud	Oil	1.5	Linseed	
			6. Blackened backcloth	Oil	1.4	Linseed	
Nicolas Poussin	The Adoration of the Golden Calf No.5597	Late 1630s?	1. Black	Oil	1.6	Linseed	8
			2. Brown	Oil	1.7	Linseed	
			3. White	Oil	1.7	Linseed	
			4. Grey-white	Oil	1.5	Linseed	
			5. Ground	Oil	1.2	Linseed	
Jean-Honoré Fragonard	Psyche Showing her Sisters the Gifts from Cupid No.6445	1755	1. White	Oil	2.4	Walnut	9
			2. Red	Oil	1.4	Linseed	
Édouard Manet	Fragments of the Execution of Maximilian and General Miramon No.3294c	1867-8	1. White cuff	Oil	3.0	Walnut?	10
			2. Green-black trousers	Oil	3.5	Walnut?	