

National Gallery Technical Bulletin

Volume 4, 1980

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

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ISBN 0 901791 72 5
ISSN 0140 - 7430

Designed by James Shurmer

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

Research Note

George Stubbs's 'Lady and Gentleman in a Carriage': A Preliminary Note on the Technique

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It has been long known that the paintings of George Stubbs (1724–1806), especially those of his later career from 1770–1790 painted on wooden panels, are often vulnerable both to normal picture-cleaning solvents and to moderate heat such as might be employed in lining or blister-laying operations. This has led to conjectures that Stubbs used some kind of non-drying, permanently soluble and fusible material such as a wax in his medium or in some other way as part of his technique [1]. When Stubbs's *Lady and Gentleman in a Carriage* (No.3529) was being considered as a possible candidate for cleaning it was thought that since it was on wood panel and from the late period (1787) it might well show the above dangerous characteristics. We were asked therefore to examine it to see if it did and if so to try and get some insight into the underlying causes.

Small samples were taken from the left-hand edge of the painting from areas of pale blue sky and the highlights of trees. These were saponified and methylated and examined for fatty acid content by our usual technique of gas-chromatography. Both samples showed significant azelate peaks and thus the presence of drying oil, and both had palmitate/stearate ratios well within the linseed oil range, namely 1.7 and 1.55. However the proportion of azelate to the saturated acids palmitate and stearate was in both cases very significantly lower than would be expected from pure drying oil undiluted by other non-drying fatty or oily material. Usually when this situation obtains the presence of egg-fats is suspected but in this case this was discounted for two reasons: addition of egg-fats (P/S ratio usually around 2.0–3.0) tends to raise the P/S ratio above the level found here; secondly staining of cross-sections did not suggest the presence of any (egg) protein.

Small fragments of paint from the sky and from a cloud were examined on the microscope hot-stage and were found to start to soften a little above 60°C. A clear melt flowed from them and the paint was disintegrated by 80°C. This result is suggestive of the presence of a wax and in this context beeswax always presents itself as a prime candidate. However, when a paint fragment was extracted with chloroform and the extract examined by gas-chromatography under the conditions used for waxes [2] no beeswax was found.

Taken as a whole the above results suggested the presence of some solid lipid material with a P/S ratio in the same region as linseed oil. The only materials which one can think of as being possibly available to Stubbs are animal depot fats (tallow) or the mixture of free fatty acids obtainable from these by hydrolysis known as stearine wax. Neither of these materials would have shown up in the examination by gas-

chromatography for beeswax. Tallow seems an unlikely, though not impossible, candidate for incorporation into paint; stearine wax, of a firmer consistency, somewhat more likely. We sought for the presence of the free fatty acids of the latter by directly methylating the extract of a paint sample (without prior saponification) and examining by gas-chromatography once more. A chromatogram showing significant amounts of palmitate and stearate alone, without azelate, was indeed obtained.

The results are thus in accord with the hypothesis that the material responsible for the unfortunate properties of Stubbs's paint, low m.p. and high solubility, is stearine wax whose m.p. lies in the region 60–70°C. Whether such material was in fact available to Stubbs must however remain uncertain. It came into extensive use in candle-making only in the early nineteenth century and it is not clear whether it was manufactured at all before then. There is however another, slightly bizarre, possible source of supply. A material chemically identical to stearine wax is formed by natural hydrolysis when fats are buried for long periods in moist ground. This is known as adipocere or, when found as it sometimes is in Scottish or Irish bogs, as bog-butter [3]. This could quite well have come into Stubbs's hands but of course this is only speculation. Unfortunately no records from Stubbs himself, or accounts by his contemporaries of his manner of working, have so far surfaced to give any support to our analytical findings.

How Stubbs used this material in his techniques is not clear. To have mixed it with the oil paint would have slowed down the drying and probably ensured that it never went to completion. This effect might have been less if the wax were applied between layers as some paint cross-sections rather seem to indicate. Stubbs's reasons for using it also remain unsure but it is worthwhile remembering that the changes in his oil-painting technique occurred at the time when he was also engaged on ambitious, large-scale pictures in enamels. Perhaps some idea inspired him of similarly blending or fusing the colours in oil paintings but we can only conjecture.

References

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