

HIRST
Conservation
✂

**PETERBOROUGH
CATHEDRAL
NAVE CEILING
PHOTOGRAPHS**

PART II



LAUGHTON HALL FARMHOUSE, LAUGHTON, SLEAFORD, LINCS., NG34 0HE. TEL: (01529) 497449 FAX: (01529) 497518

**PETERBOROUGH
CATHEDRAL
NAVE CEILING
PHOTOGRAPHS**

PART II

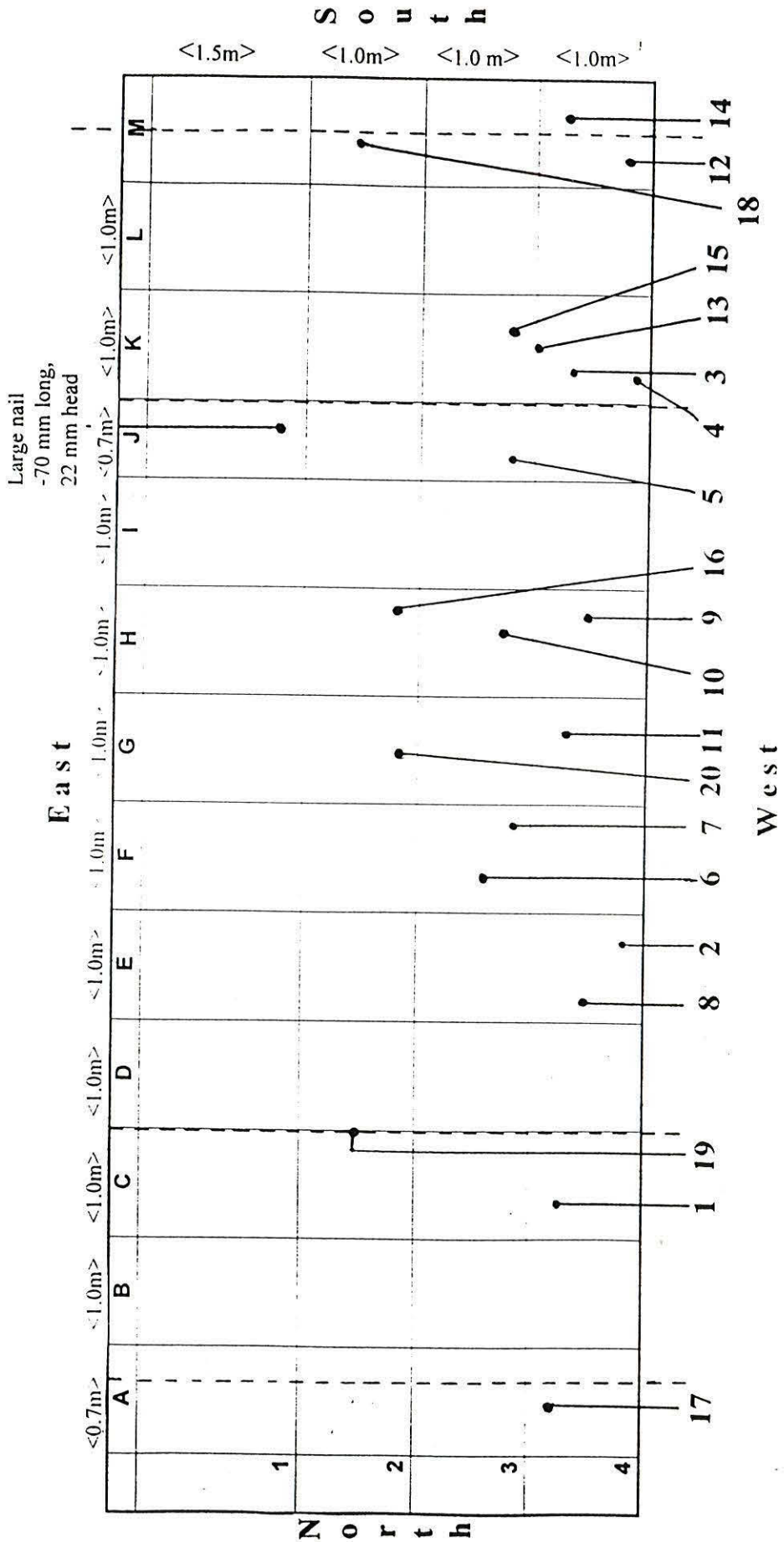
APPENDIX B: PAINT ANALYSIS / PHOTOMICROGRAPHS

PHOTOMICROGRAPHS

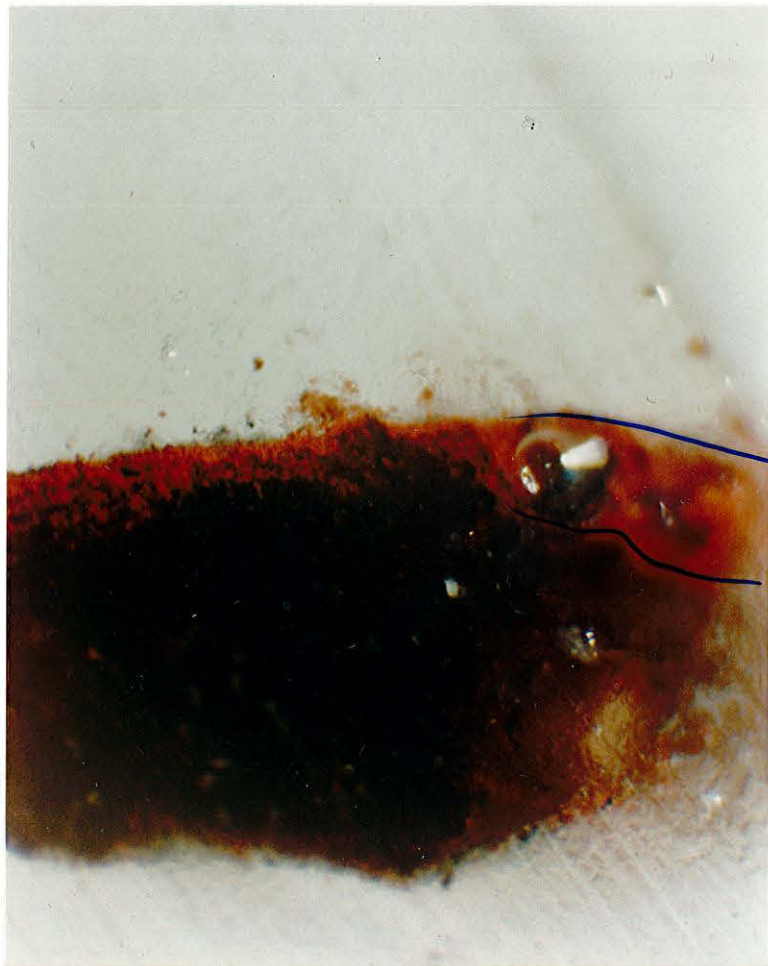
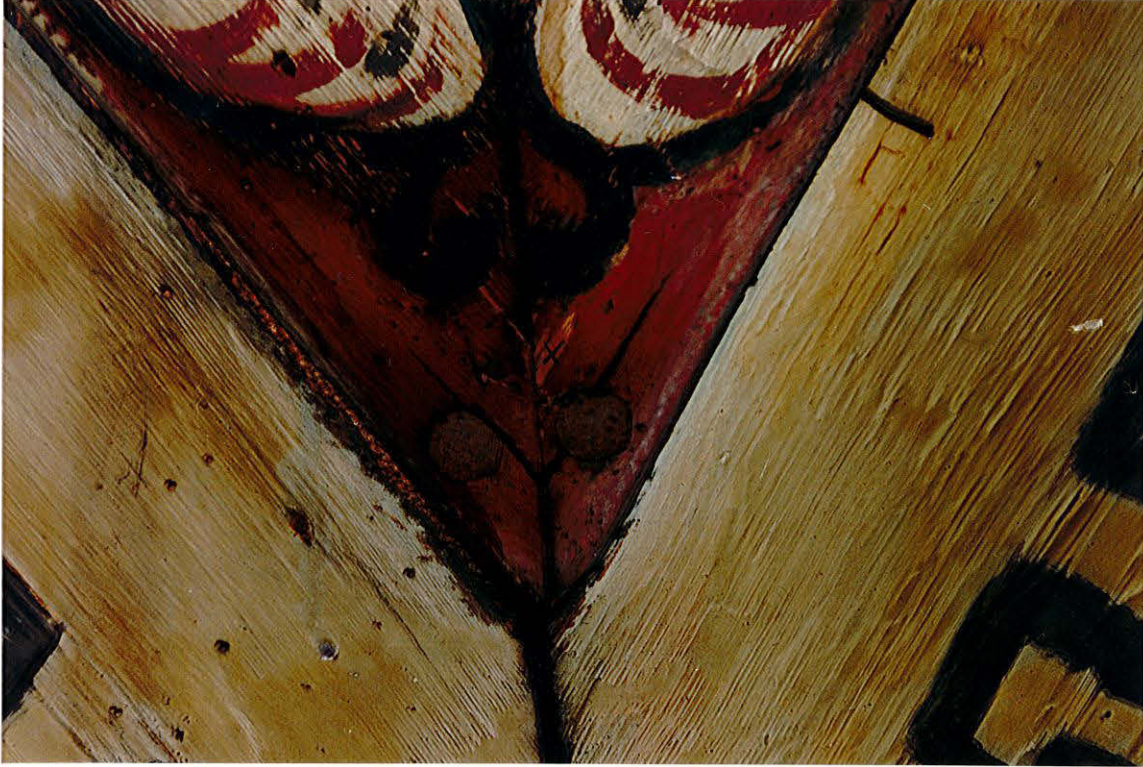
Film	Kodak Gold II 200 ASA colour print film.
Camera	Pentax body, Pentax 50mm lens, cable release.
Microscope	Omo Biolam, linear magnification 60x
Exposure	10 seconds, with incident light.

A number of paint samples were taken for microchemical and cross-sectional analysis to help determine the layer structure, pigments, date, medial and sequence of previous restorations. The results are tabulated below.

PLAN SHOWING LOCATION OF PAINT SAMPLES



Sample no.	Location	Colouration/pigments/media/layers
1	C4	Red ochre paint (old layer on black) from red lozenge surround to face. Note: White ground layer appears to be absent from earlier painted decoration.



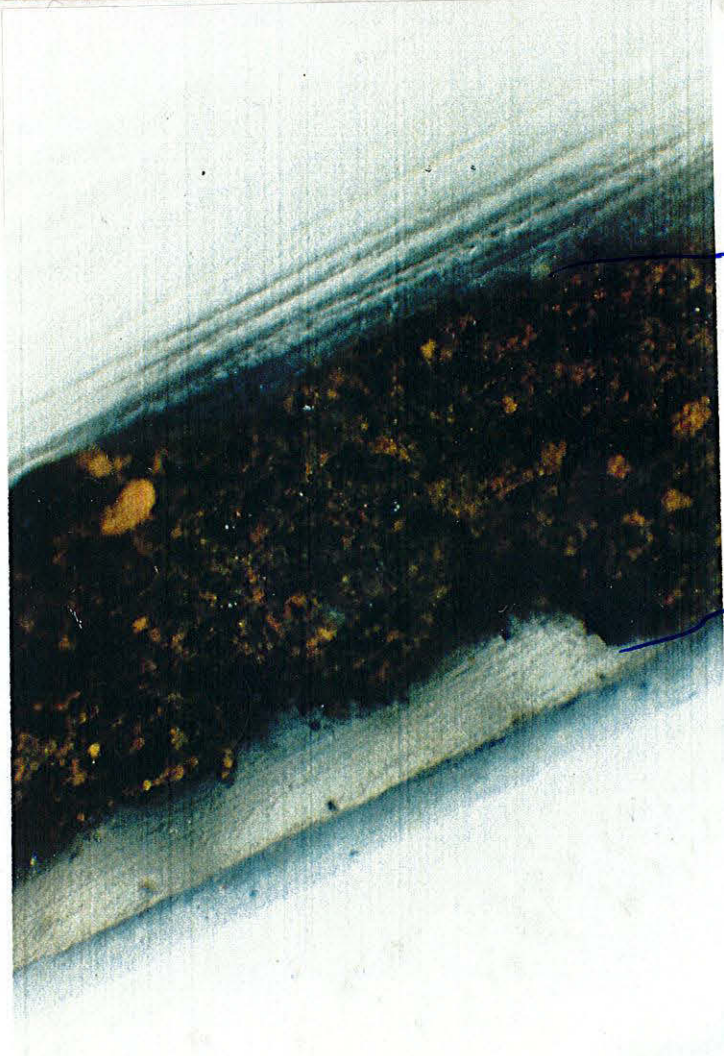
red ochre

wood

2

E4

One layer - a mixture of black and brown earth particles, no apparent ground layer. NB - flaking apparent.

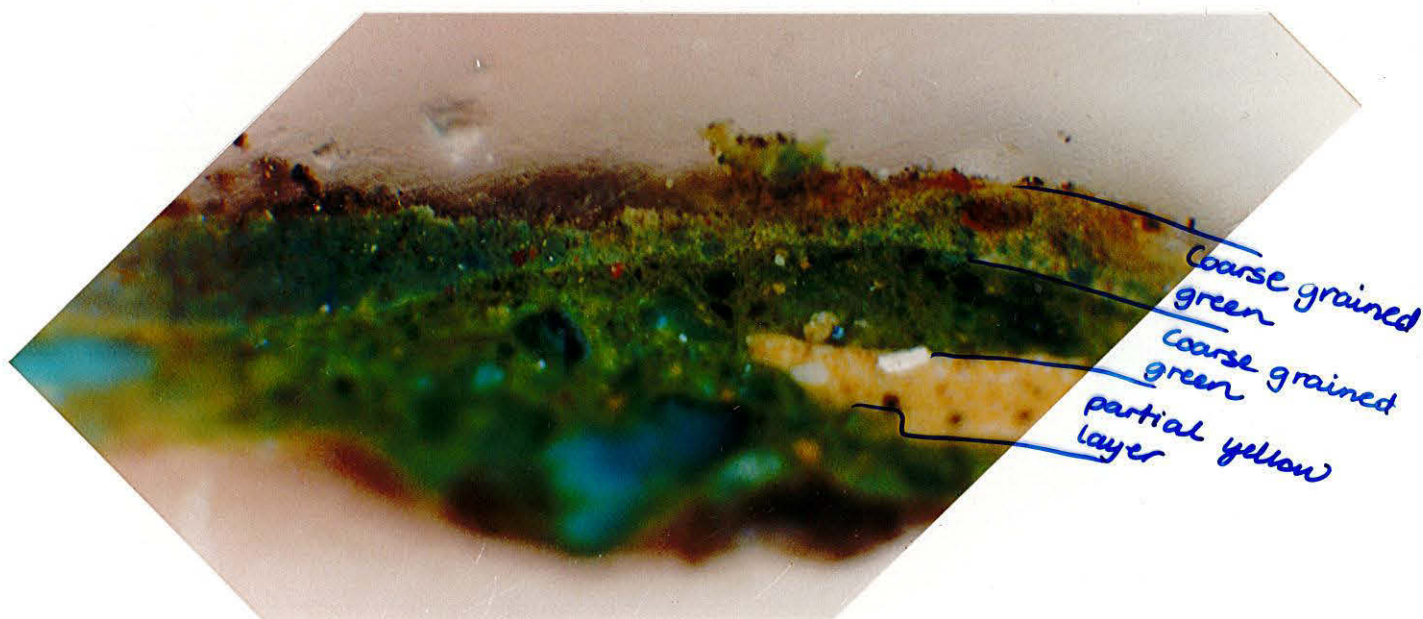
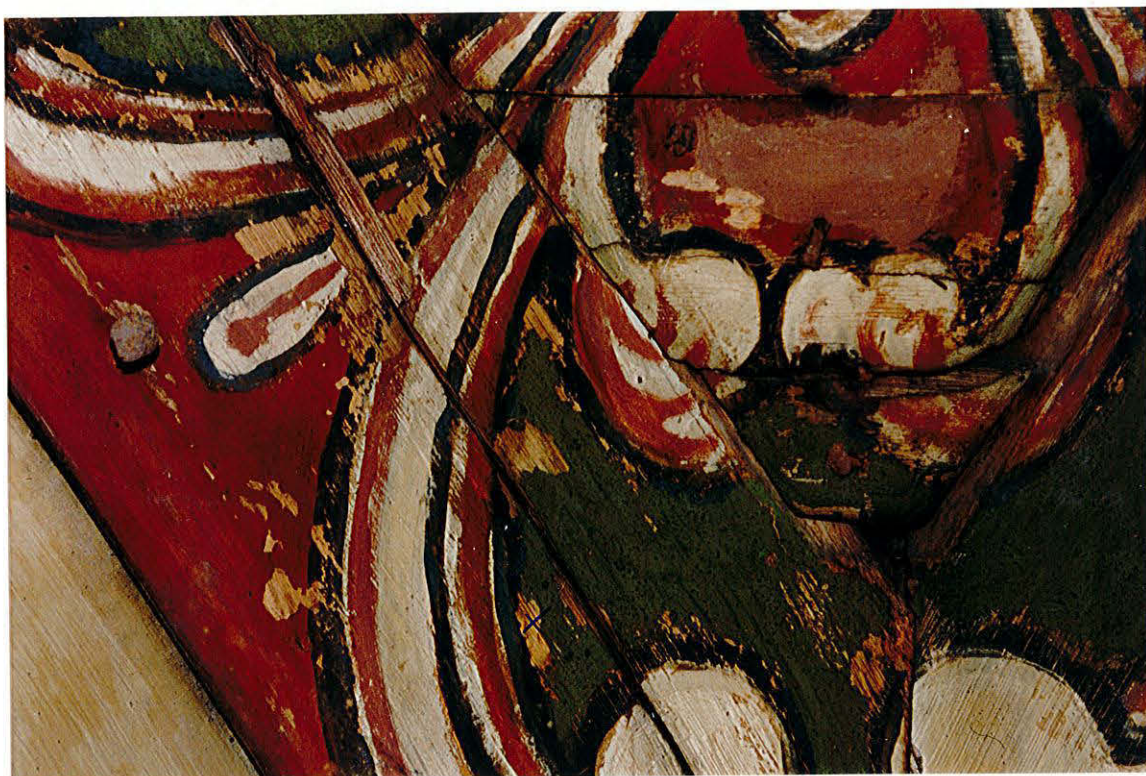


One layer -
black & brown
(earth) particles
No Ground

3

K4

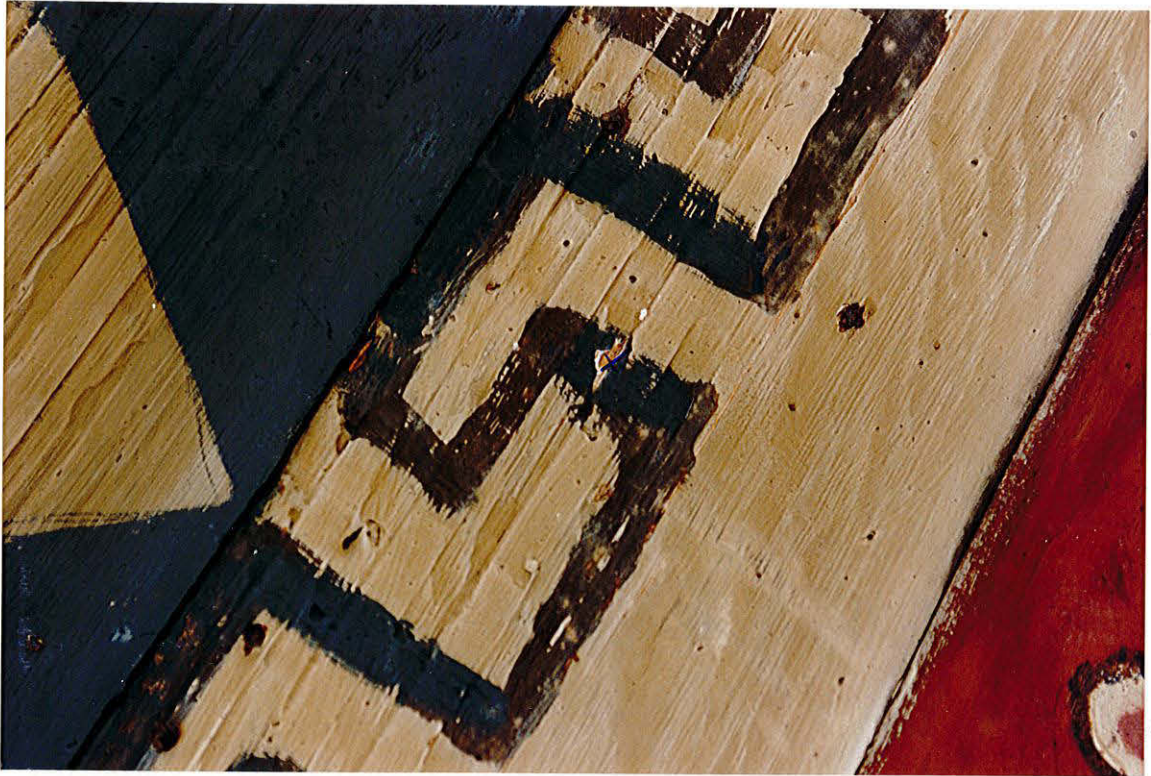
Coarse grained Verdigris (copper acetate) are visible as the blue/green clear particles in x-section. No ground layer evident. From corner section of face to green man, most likely to be original paint. On the second x-section a partial yellow layer lies beneath the green layers. From corner section of face to green man, most likely to be original paint. NB - flaking of the coarse grained layer is evident.



4

K4

Black layer with earth coloured particles evident, on white ground or gesso. From grooved area of older board. See x-section.



5

J3

Black layer on white ground. Appears glossy but thin in situ, from an older board. Contains earth coloured particles and a discontinuous transparent layer on top (possibly glue-drips from hessian application). See x-section.



6

F3

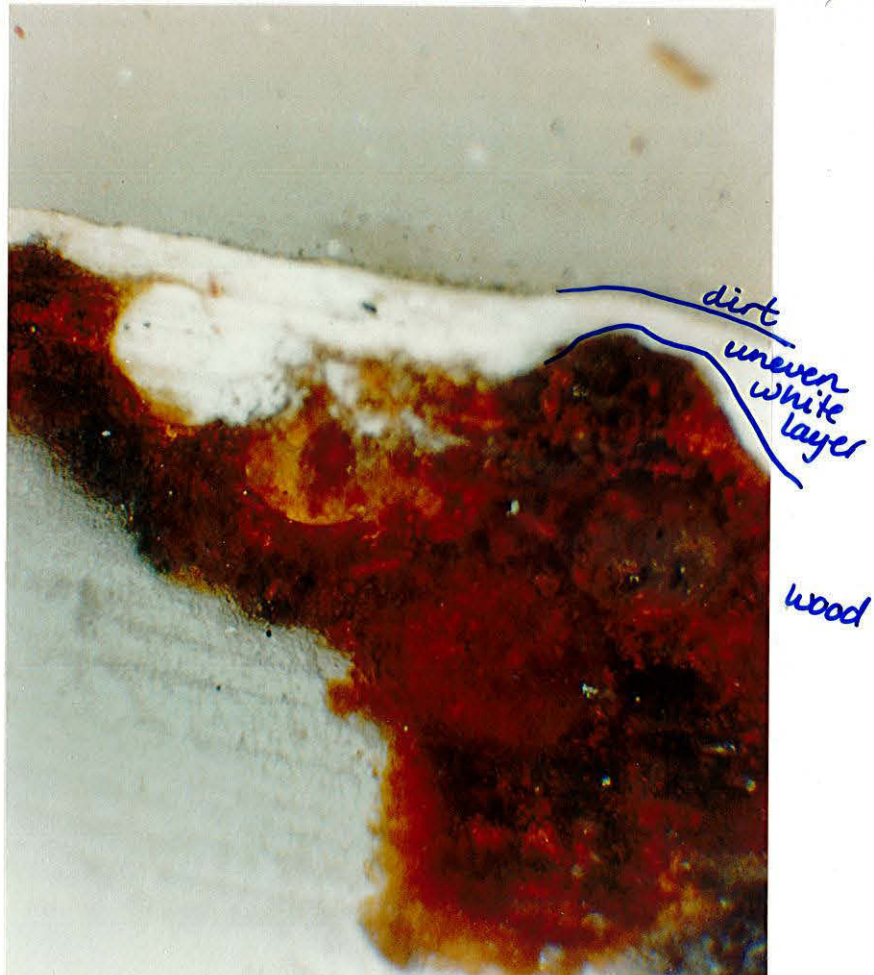
Buff/white paint with dirt layer taken from area where underpaint could be seen. No obvious ground layer. Relief pattern seen in raking light in situ. See x-section.



7

F3

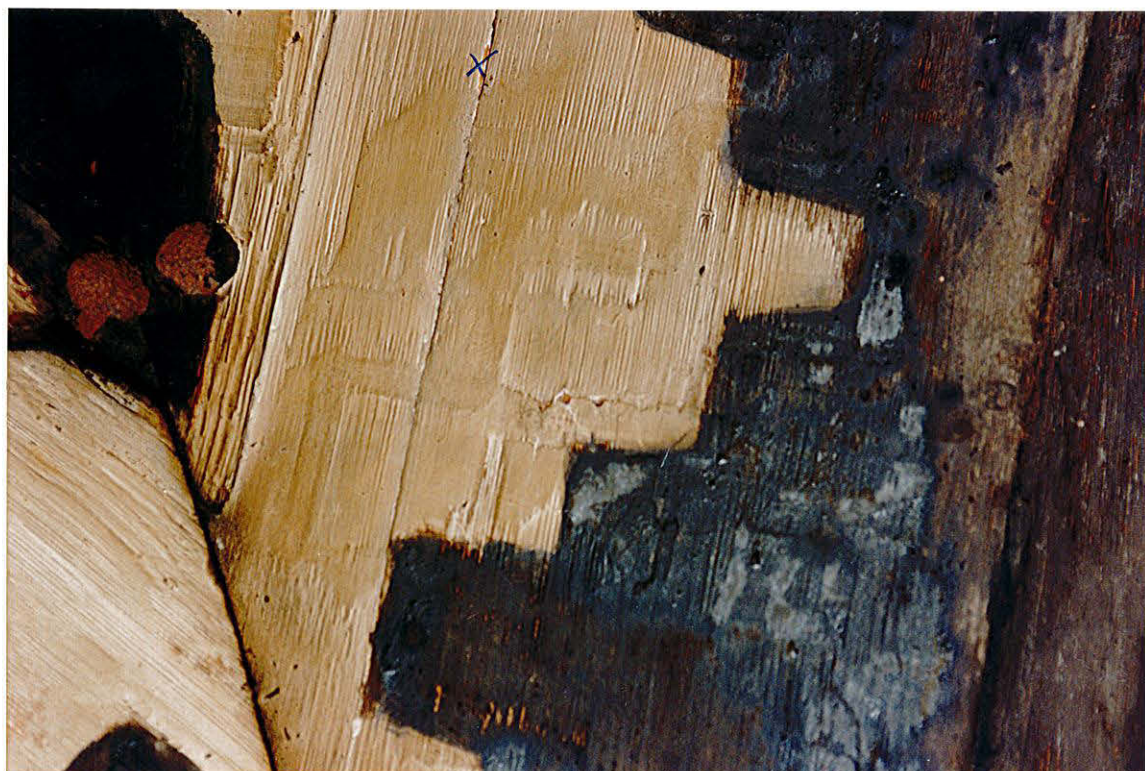
Buff/white paintlayer on wood.



8

E4

White paint layer on black thin underpaint. In situ underpainted design seen in raking light. The board was presumably re-located at some time. See x-section.



9

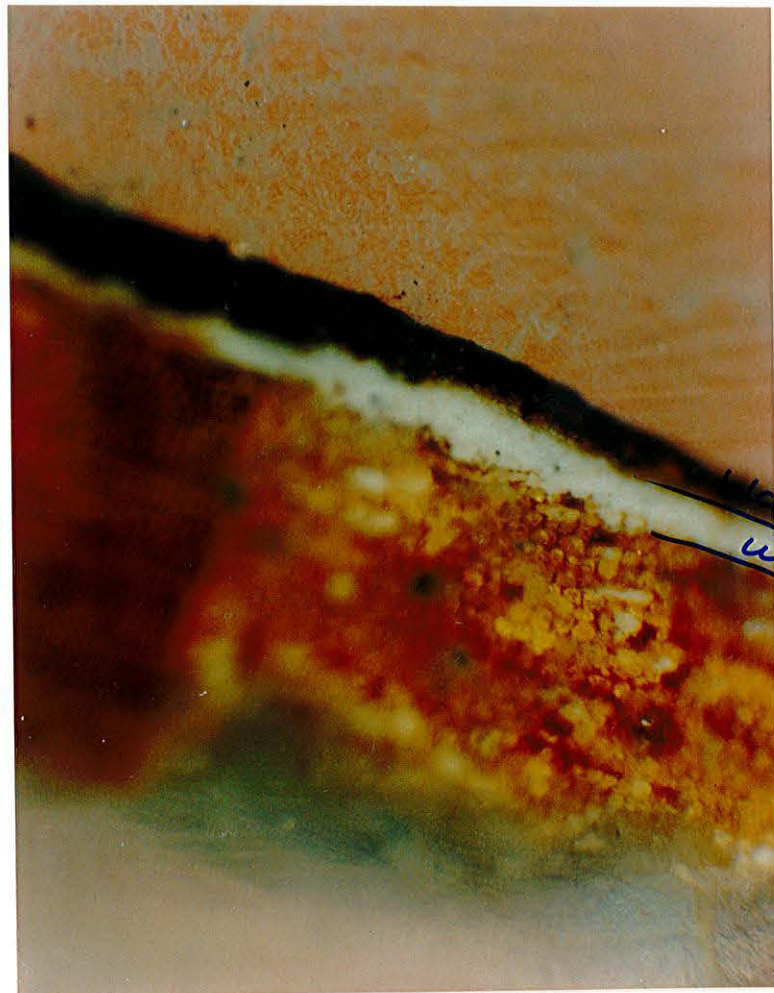
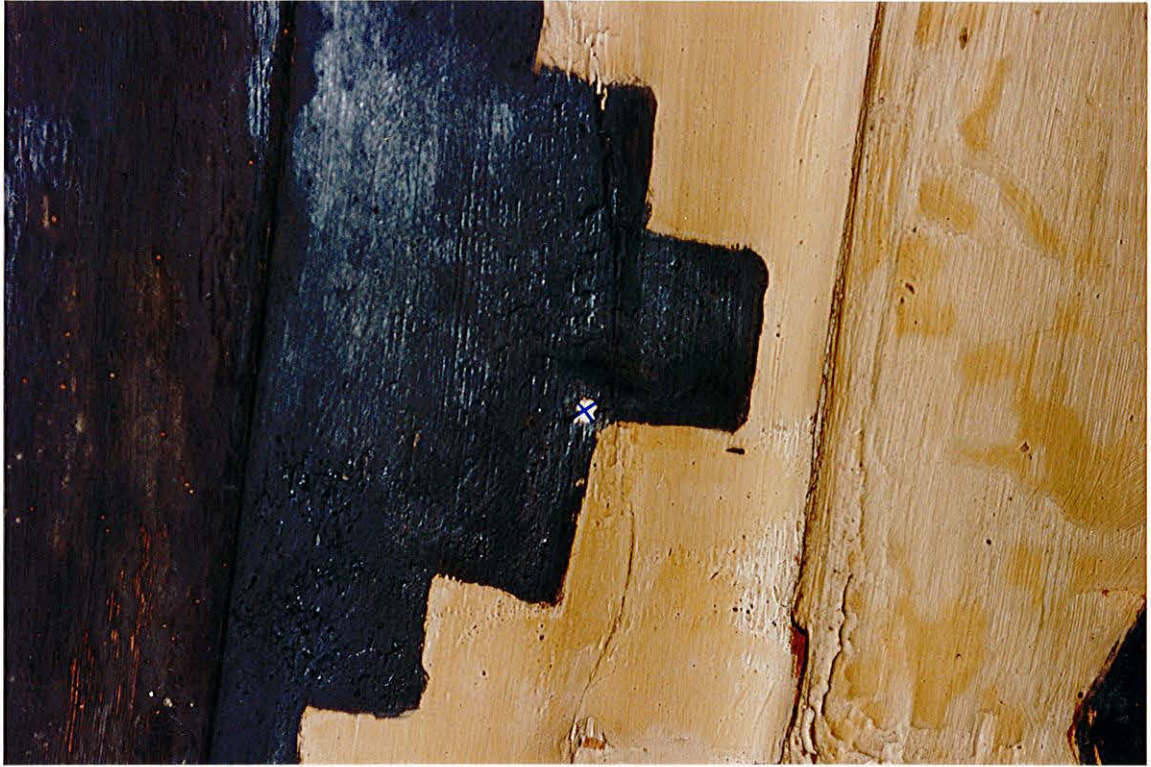
H4 Thick layer on white ground. High impasto overpaint seen in raking light. (Cross-section inconclusive - photomicrograph hence not included.)



10

H3

Black layer on white ground. From new board. See x-section.

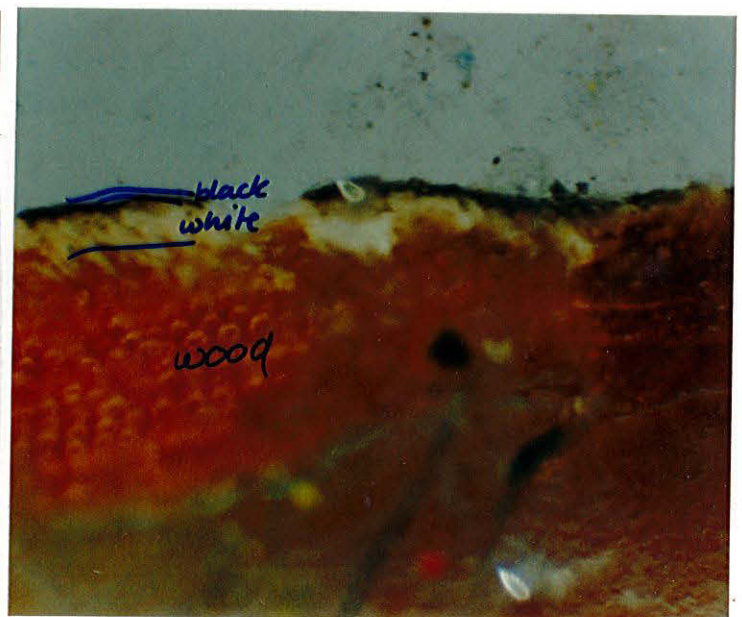
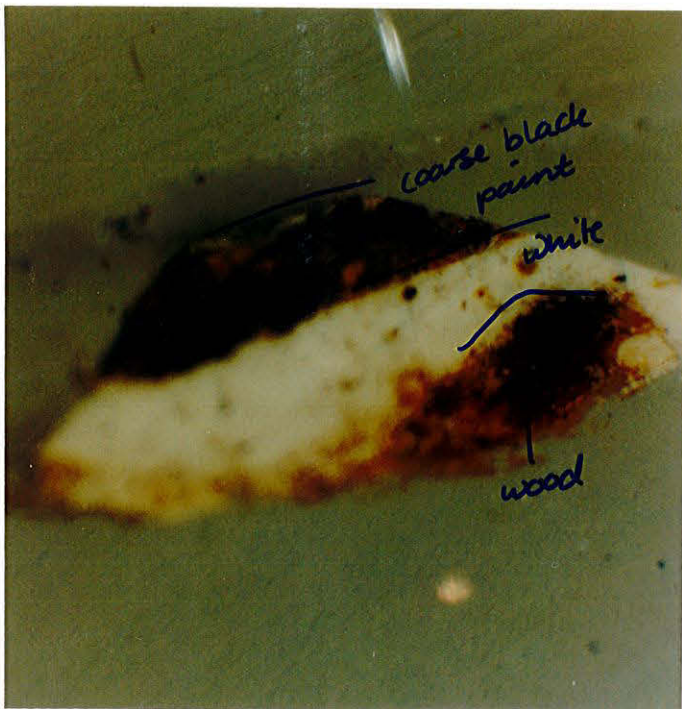


Black
White
Wood

11

14

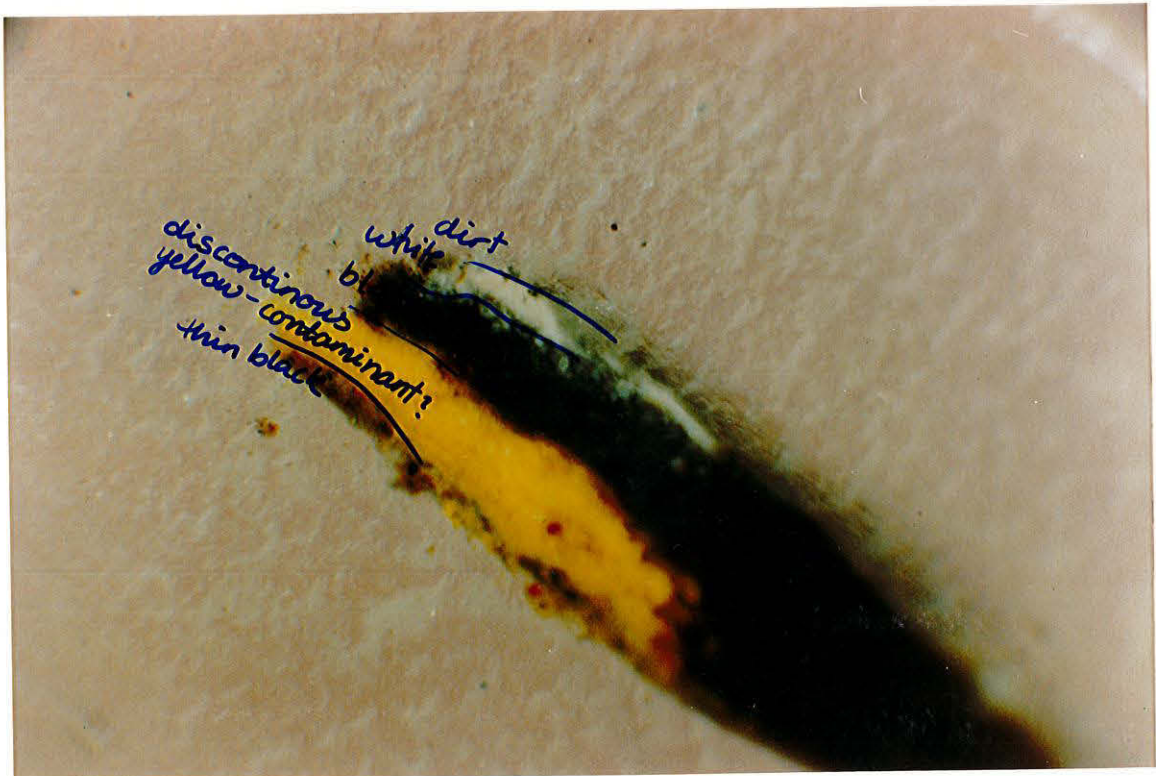
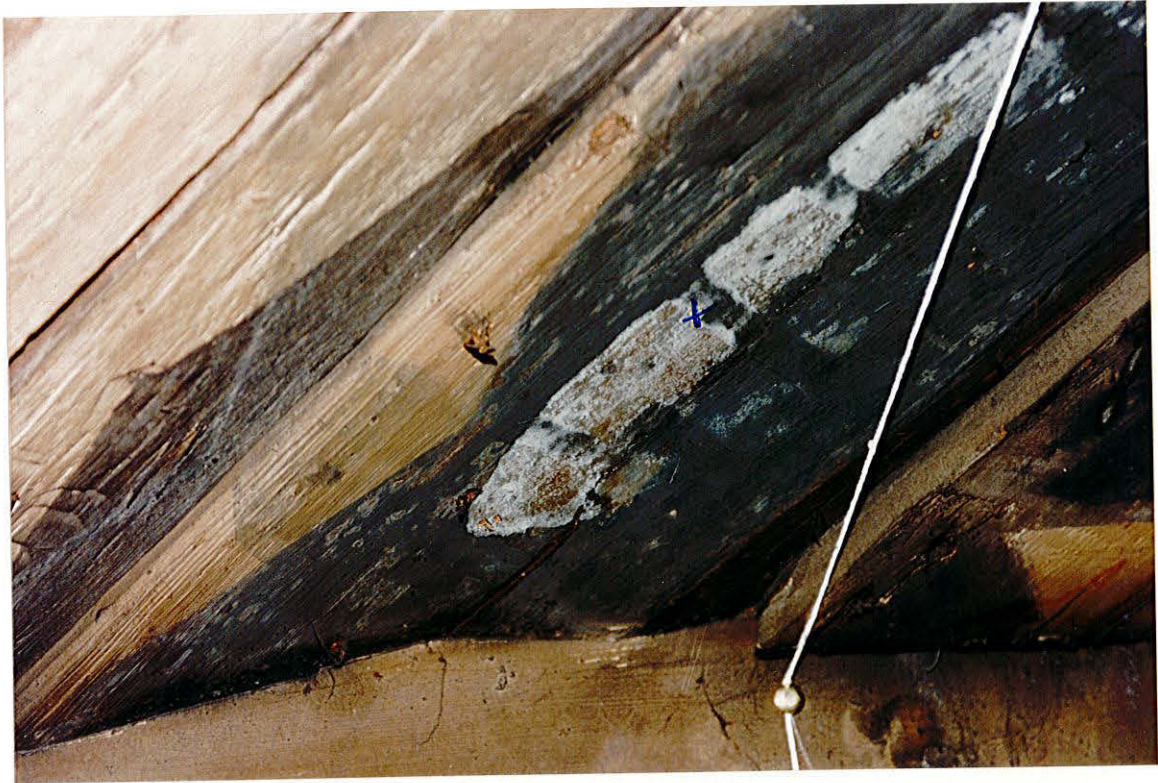
Two samples were taken - one from old board and one from new board. See cross-sections for comparison of paint layers.



12

M4

Black layer on white ground with a discontinuous yellow layer. In situ, surface is greyish and discontinuous. See x-section.



13

K4

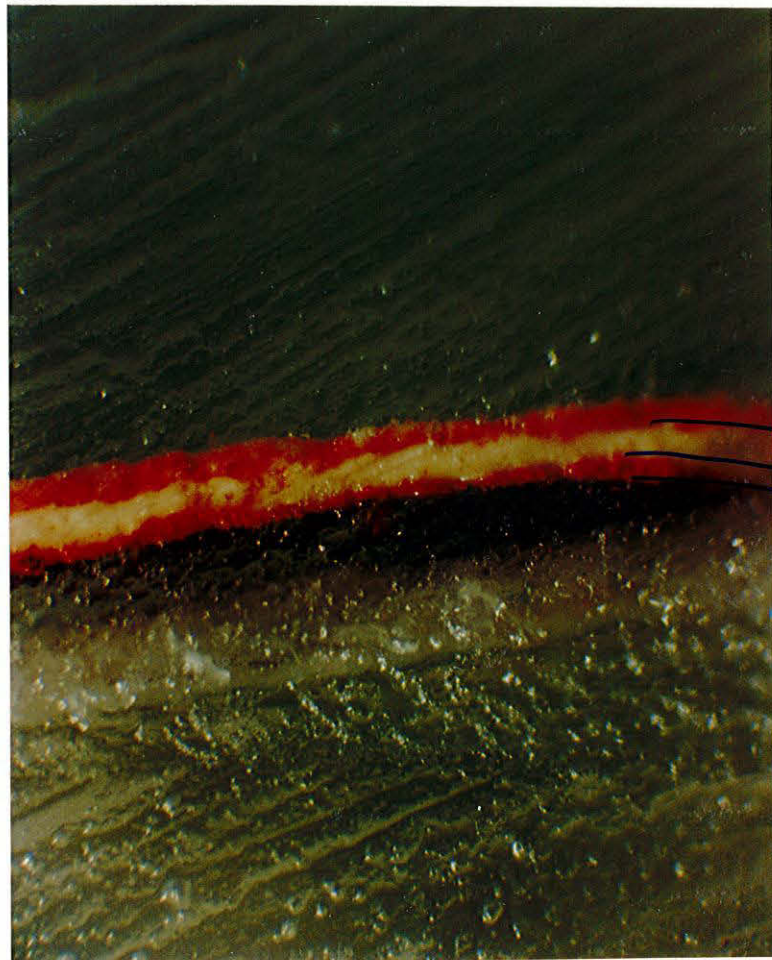
White paint layers on black. Cream surface with white ground, clearly an altered design on old board. See x-section.



14

M4

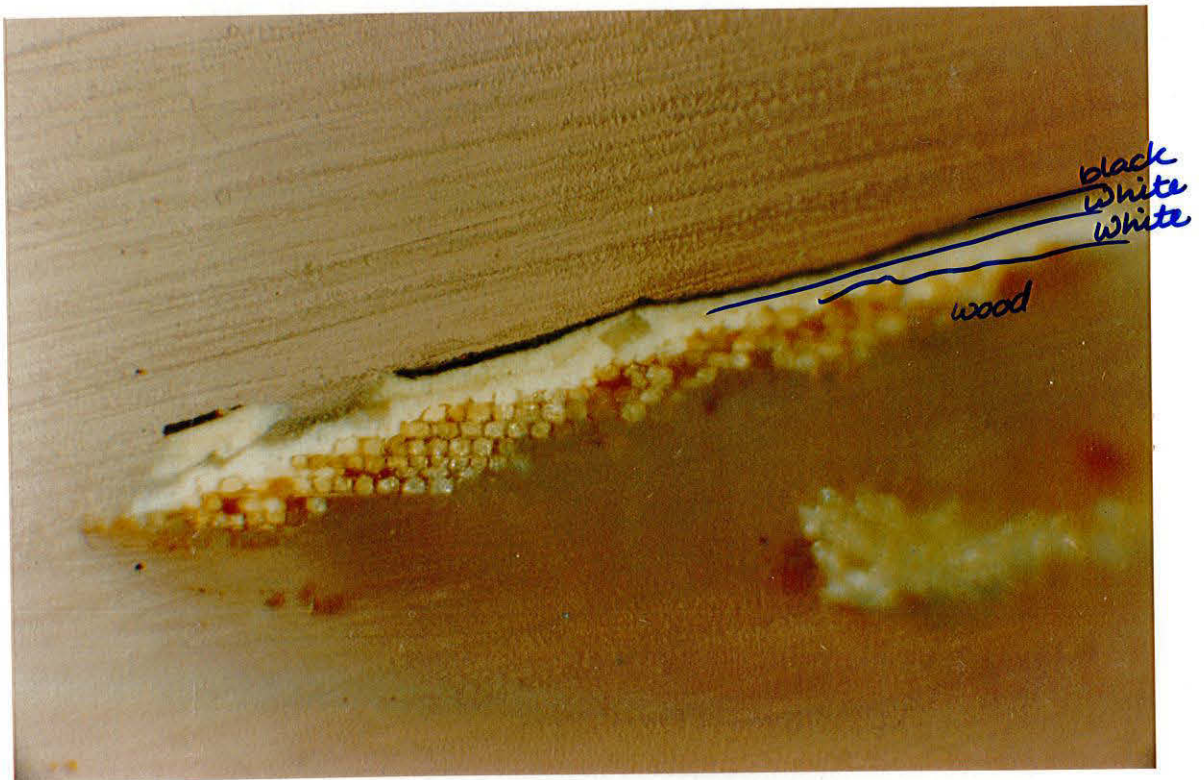
Red from flower petal, North-side. Cross-section showing red on white on red.



15

K3

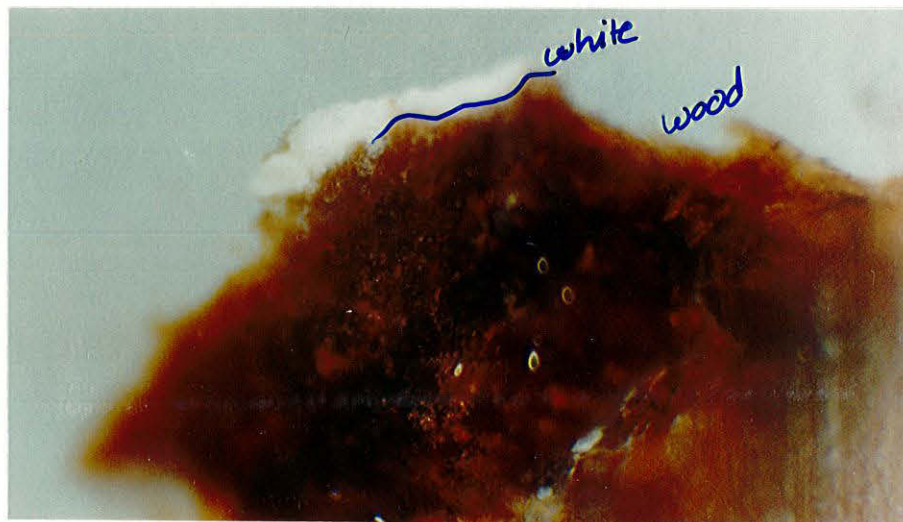
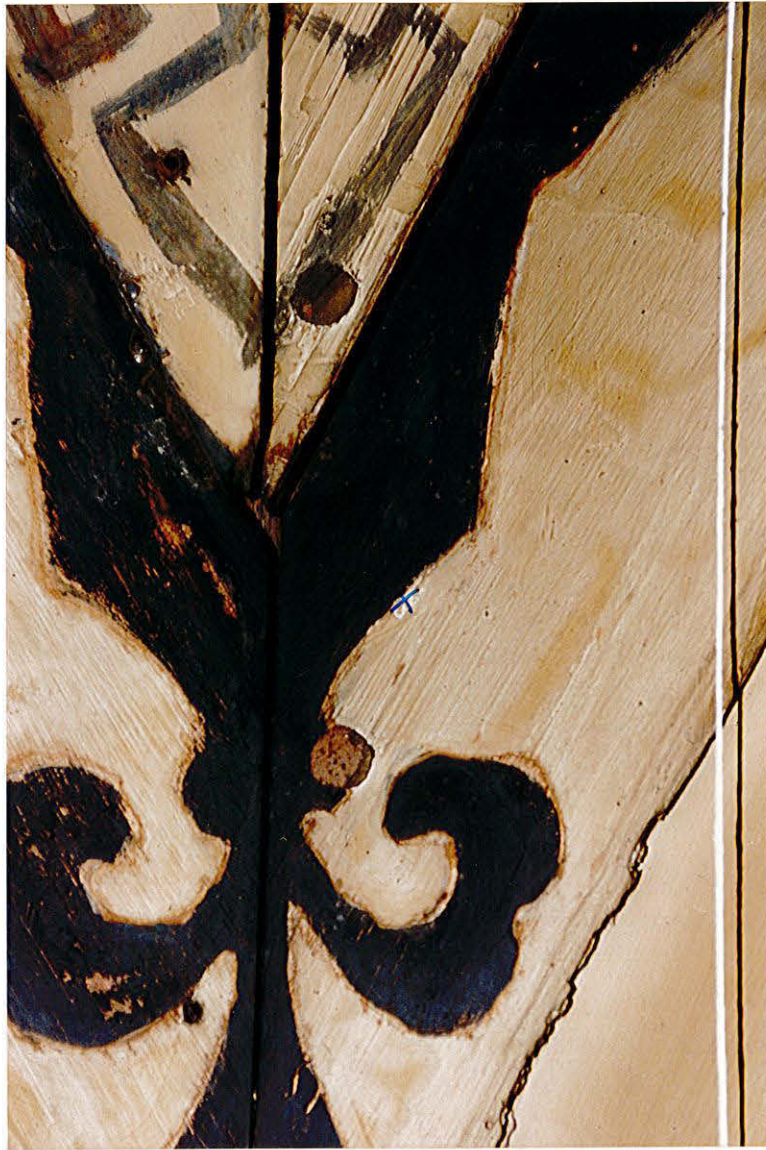
Black layer on white ground layers. Appears greyish in situ on newer board.



16

H2

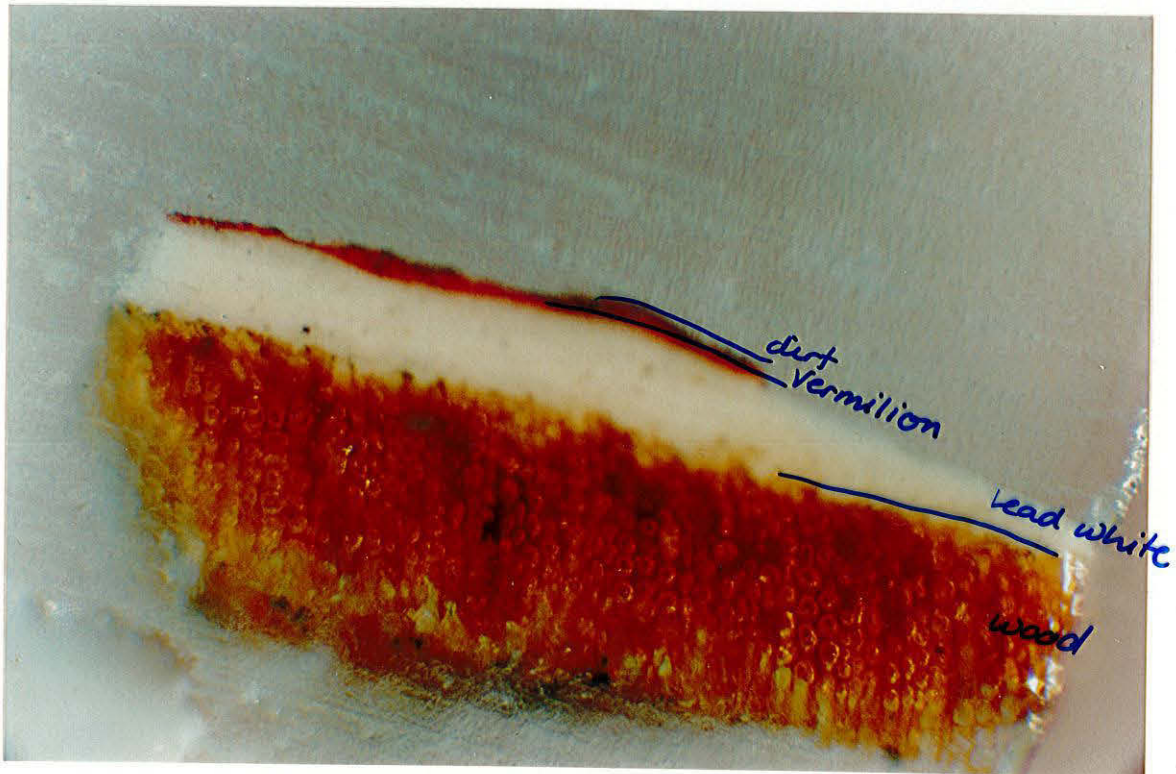
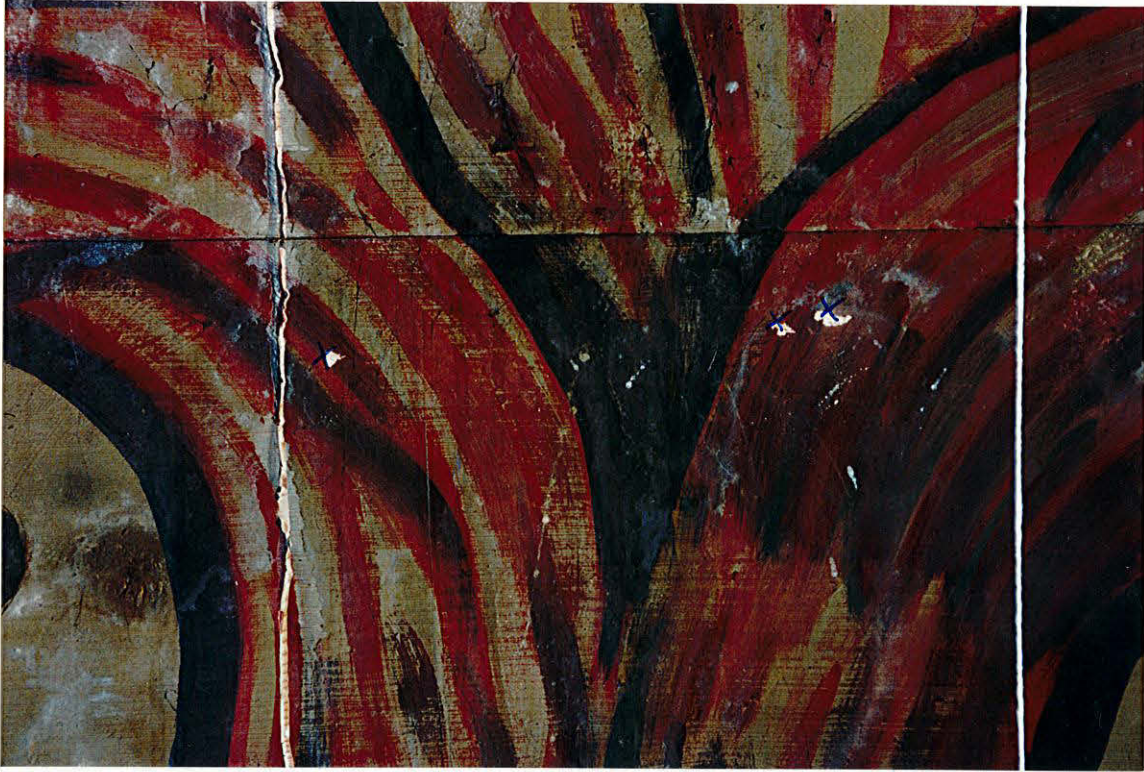
Cream/white paintlayer on wood. From edge of black design on old board.



17

A4

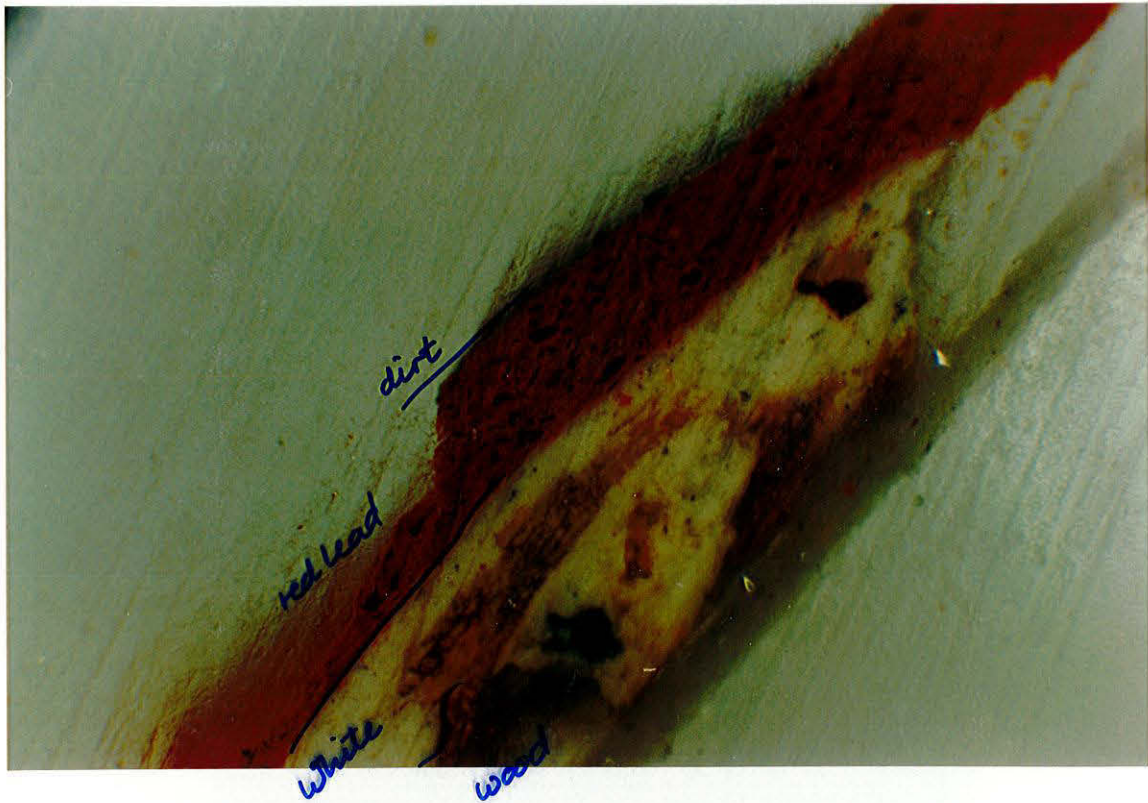
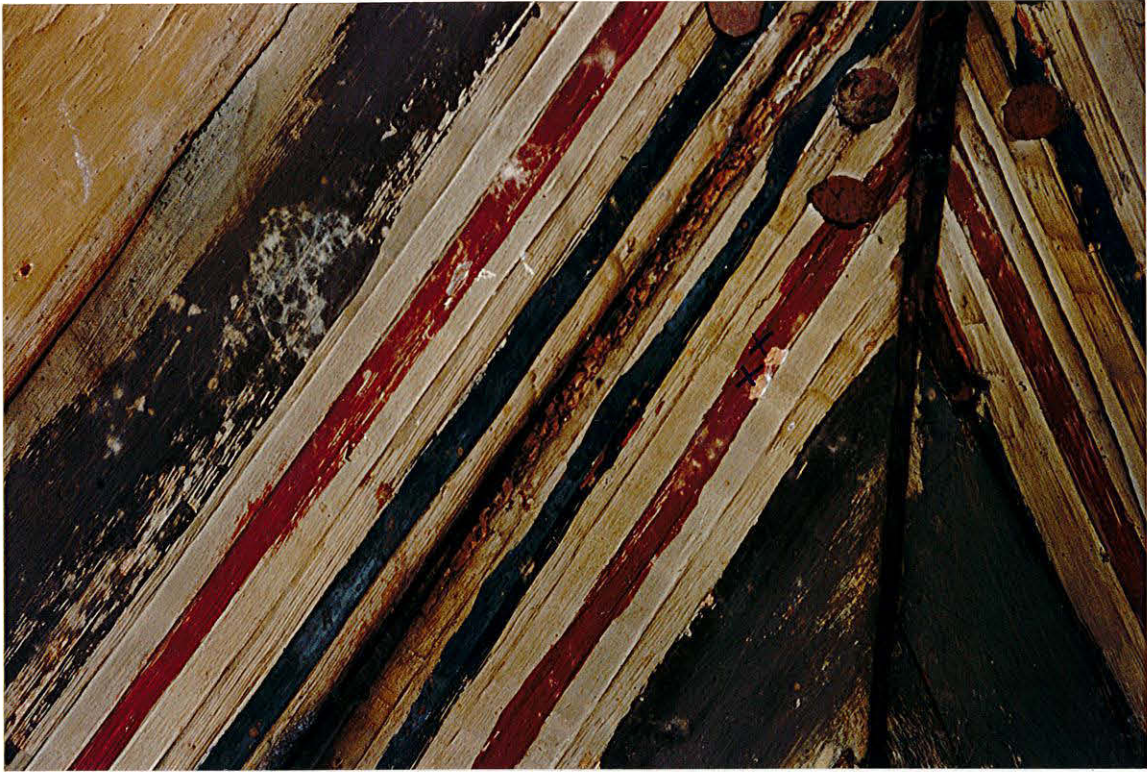
From red flower. Dirt layer on thin red paint on white on wood no ground layer evident. Sample 17 tested positive for Vermilion, the white ground was lead white. Medium stains tested positive for protein (tempera?). Raking light suggests alterations, if not overpaint - in which case the earliest layer visible is white.



18

M2

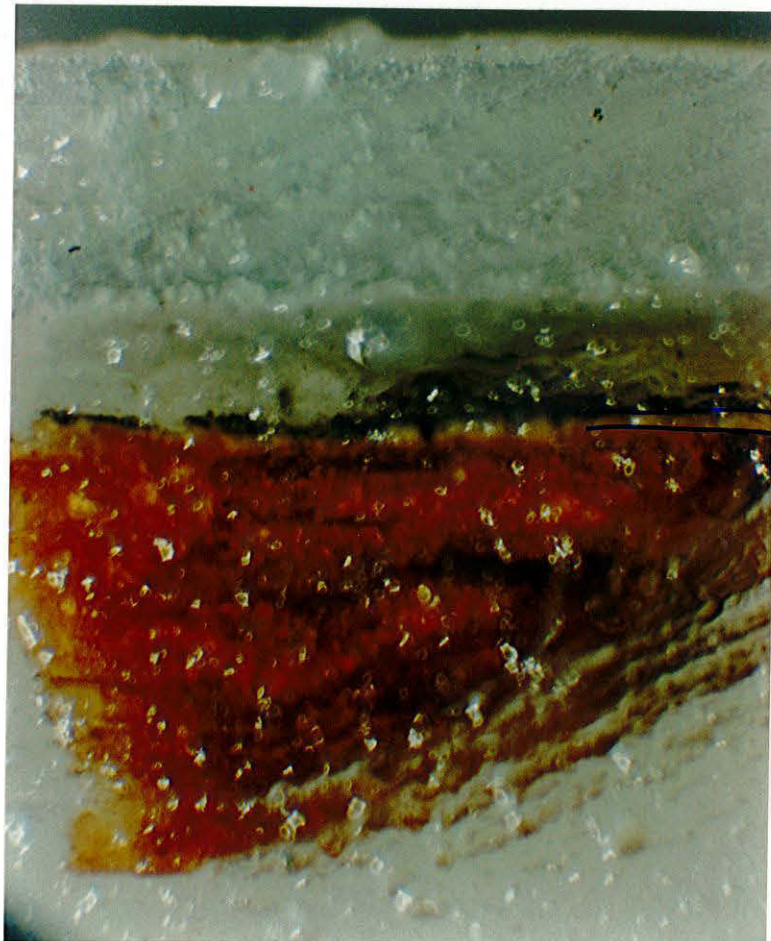
Sample taken from older, grooved panel. Cross-section showing dirt-layer, red (lead) layer, white layer on wood.



19

C2

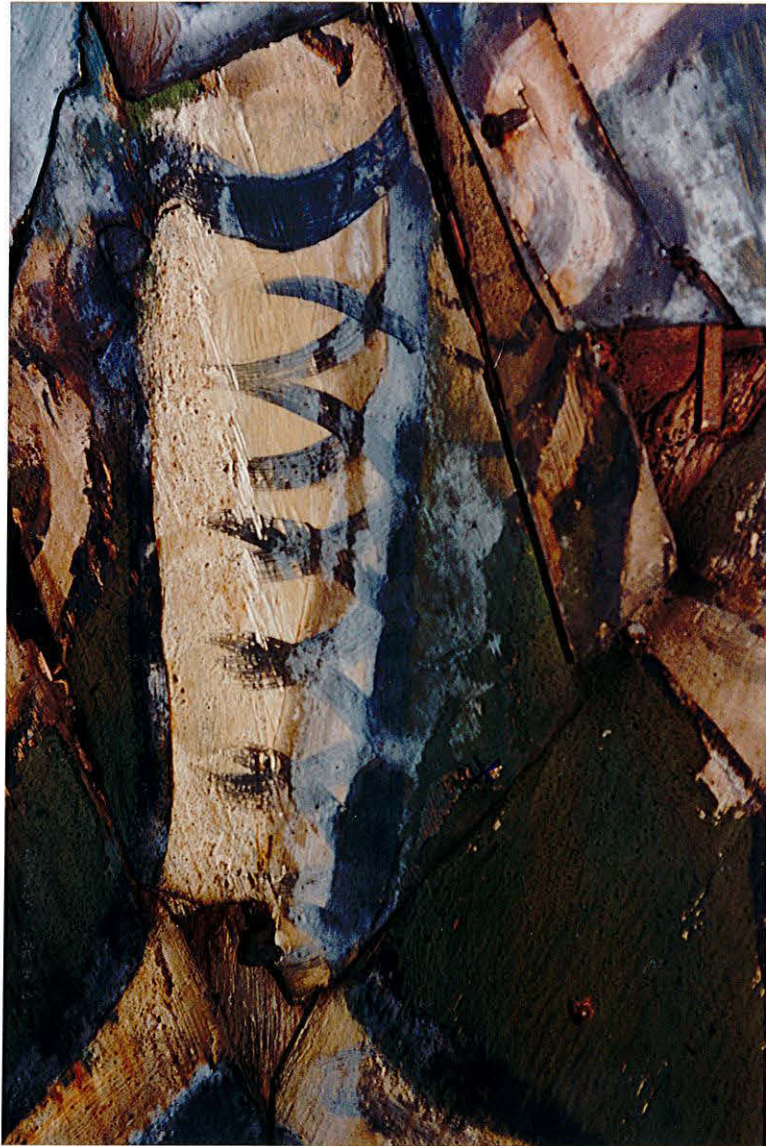
Sample from older, grooved panel. Cross-section is showing thin blue layer, thin white layer on wooden ground.



Thin black layer
Thin white layer
wood

20

G2 Sample of early green paint. (Cross-section inconclusive, hence not included.)



TESTS / OTHER OBSERVATIONS

- 1 Samples of the apparently older, black layer were tested: complete ignition indicated a carbon black; water solubility indicated either a degraded paint medium or a glue-size medium.
- 2 Sample taken from new board, has thin black layer on white with a very thin red layer (or primer) on the wood. The red layer tests positive for lead (turns brown PbO_2 with HNO_3) suggesting red lead.
- 3 All whites test positive for lead and show effervescence therefore $PbCO_3$ i.e. lead white.

APPENDIX B/ADDITIONAL NOTES

A selection of the cross-section were re-examined under a higher-powered/U.V. microscope at Greenwich to confirm certain observations. These comments complement those in the main part of Appendix B.

Sample 3, location K4

- 1 A golden ground layer was evident, possibly composed of chalk in a size medium. Small, clear particles were evident.
- 2 A thinner, whitish layer was noted.
- 3 A partial thin layer of black (charcoal?) and red particles was also evident. This may be underdrawing.
- 4 Large, irregular particles of a copper blue were interspersed with yellow ochre.
- 5 Nothing of note was observed under U.V. examination.

Sample 5, location J3

- 1 A golden layer was noted on the top of the sample. This appeared to be glue size (probably from the hessian application).
- 2 In U.V. this layer fluoresced slightly and was confirmed as glue. The fluorescence could result from an anti-bacterial additive to the glue size.
- 3 A very mixed coarse layer, at first thought to be black, contained brown particles.

Sample 7, location F3

- 1 The sample has only one layer of white, where it was suspected there could be two.

Sample 15, location K3

- 1 Softwood.
- 2 Chalk ground with inclusions. Possibly two ground layers.
- 3 Single black layer.

Sample 17, location A

- 1 Softwood.
- 2 Thick white ground.
- 3 The Tudor flower is clearly painted in Vermilion.

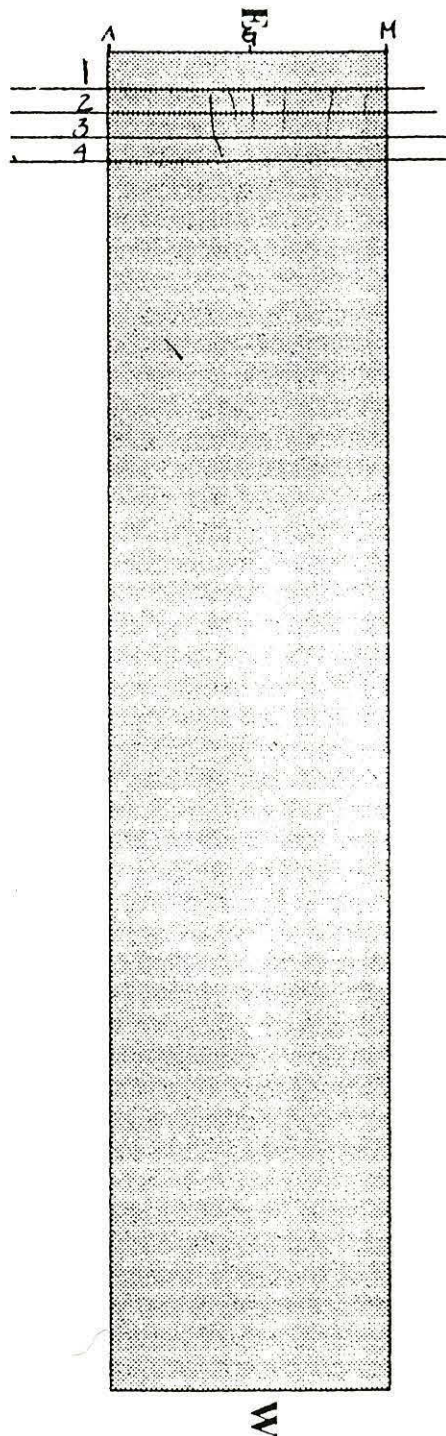
Sample 18, location M2

- 1 Seems to have a Vermilion layer with a red lake layer on top. Common painting technique of the period.

APPENDIX**C: LARGE SCALE DRAWINGS AND
PHOTO-MOSAIC**

Diagram	C1	Plan view of ceiling area surveyed
Drawing	C2	Large photo-mosaic
Drawing	C3	Colour-coded drawing showing the different types of boards
Drawing	C4	Overlay to C3 showing different types of fixings
Drawing	C5	1:20 scale elevation drawing of nave roof and ceiling (Drawing no. DFB 25695/1)
Drawing	C6	1:20 scale plan drawing from above, elevation of north sloping ceiling looking south, bay 1 (DFB 25695/2)
Drawing	C7	Sketch of proposed hanger detail as applied to existing binder/beam and ceiling joist






PETERBOROUGH CATHEDRAL NAVE CEILING
AREA SURVEYED FROM SCAFFOLDING, 1995.








APPENDIX C

KEY TO DRAWING AND OVERLAY

Boards

Early, Grooved Boards	Yellow	
Early, Non-Grooved Boards	Orange	
Newer, Milled Boards	Blue	
Newer, Planed Boards	Green	
Uncertain	Pink	

Fixings

Large Bolts	
Large, Round Headed Nails	
Medium, Round Headed Nails	
Small, Round Headed Nails	
Medium, Flat Headed Nails	
Screw Tips	