

The extraordinary universe of Peter Apian: technical investigation of five copies of a 16th-century astronomical book

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Supplementary Information

Figure S-1. Images of all the pages analysed in the five books. Images reproduced © The Fitzwilliam Museum, University of Cambridge, by kind permission of the BL, by courtesy of the Warden and Scholars of New College, Oxford, by The Master and Fellows of Peterhouse, Cambridge, and by the National Library of Scotland. Images of the NC and PC copies were taken in situ with a personal camera.

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Figure S-3. FORS spectra collected in the five books corresponding to a green area of folio B3r. The apparent absorbance maximum at 720 nm and the shape of the band can be associated with the presence of verdigris, and the absorptions at 2307 and 2344 nm with the presence of a lipidic binder. The rest of the bands are associated with the paper substrate.

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Figure S-8. a) Yellow area on folio H1r of the NLS book, showing the presence of yellow pigment particles; b) particles of mosaic gold on folio F1r (NLS book); c) XRF spectra suggesting the presence of lead-tin yellow on folio H1r (red line) and mosaic gold (black line).

Figure S-9. Changes on G4r: the text is a) absent (FM), b) pasted in (NLS) or c) printed (PC, NC, BL). Images reproduced © The Fitzwilliam Museum, University of Cambridge and by kind permission of the BL, by courtesy of the Warden and Scholars of New College, Oxford, by The Master and Fellows of Peterhouse, Cambridge, and the National Library of Scotland.

Figure S-10. Peter Apian's insignia at the end of the book (folio O6r). A modest roundel is evident in a) the FM book, while it is a full-page insignia in b) PC and c) NLS (BL and NC not shown here) after his change of status. Images reproduced © The Fitzwilliam Museum, University of Cambridge, by kind permission of The Master and Fellows of Peterhouse, Cambridge, and the National Library of Scotland.

Figure S-11. Dragon volvelle painted on folio F3r. In the FM book (a), the pigments and shading are carefully applied, compared to a less precise application in the Peterhouse copy (b). Image reproduced © The Fitzwilliam Museum, University of Cambridge and by kind permission of The Master and Fellows of Peterhouse, Cambridge.

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Table S-2. Distribution of the blue pigments on the folios analysed in each copy. The asterisk indicates that only a visual examination has been carried out.

Fitzwilliam Museum (FM)



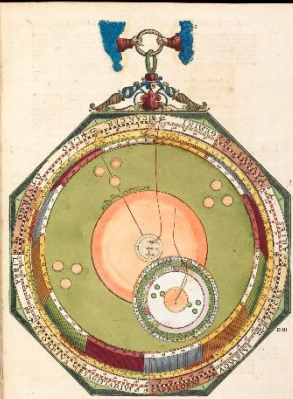
A1R



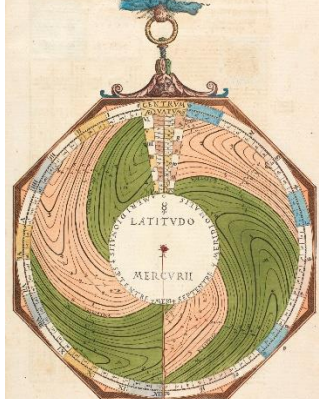
A1v



B3r



D3r



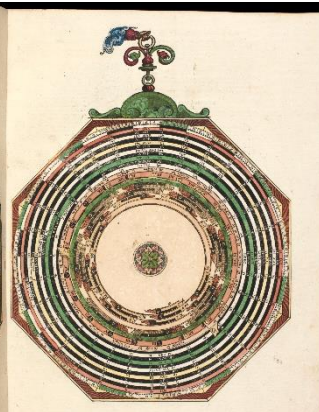
F1r



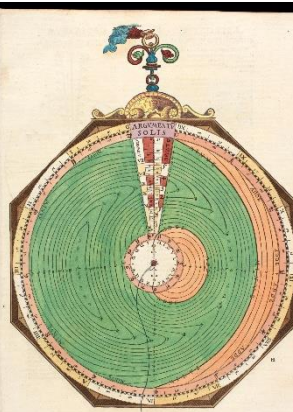
F3r



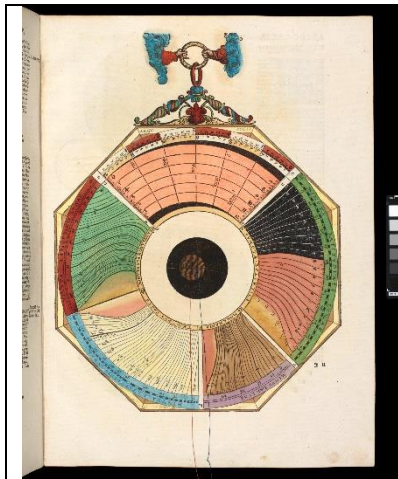
G3v



G4r



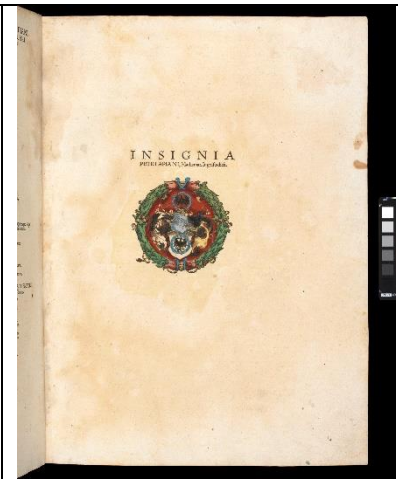
H1r



12r

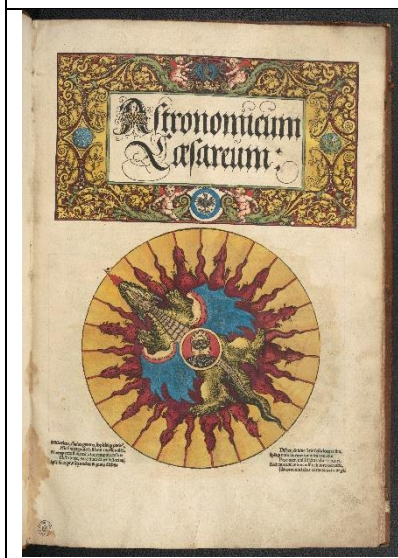


M3r

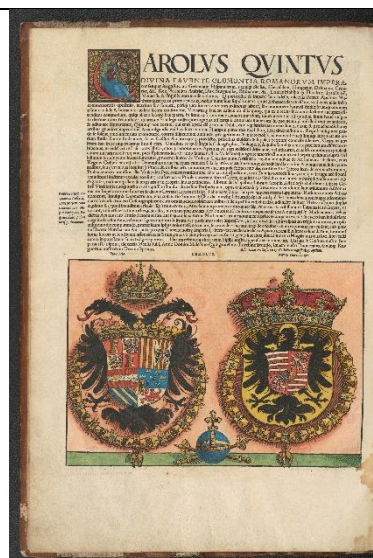


O6r

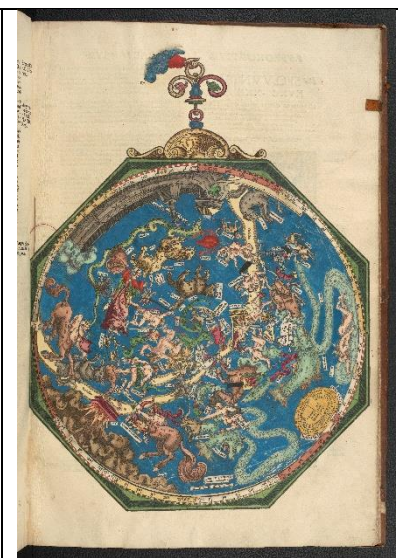
National Library of Scotland (NLS)



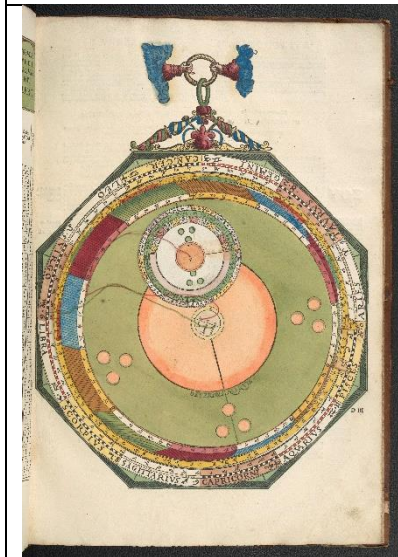
A1R



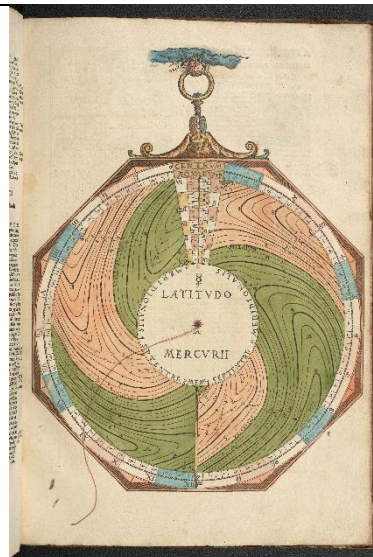
A1v



B3r



D3r



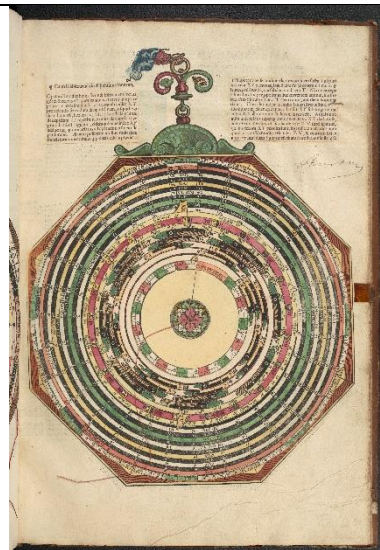
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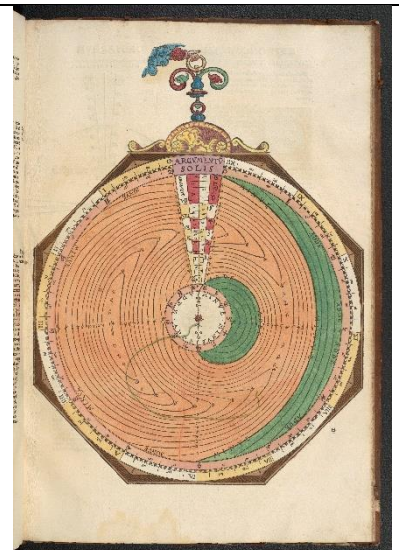
F3r



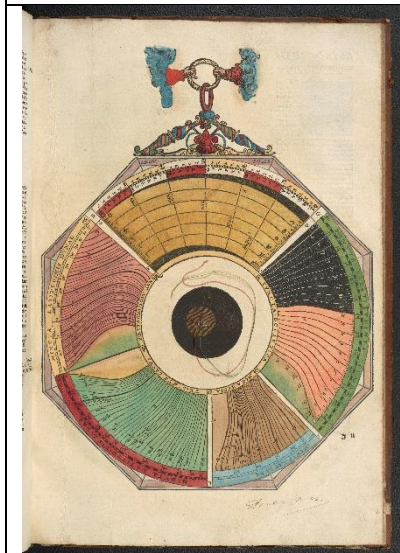
G3v



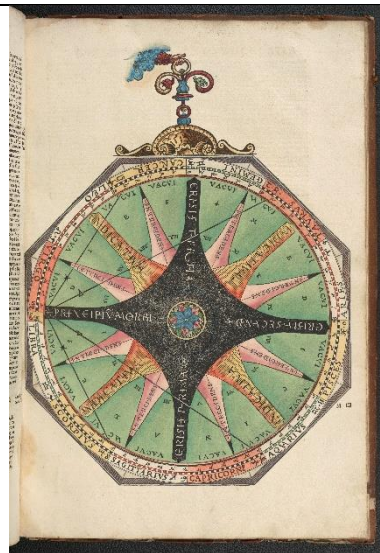
G4r



H1r



I2r

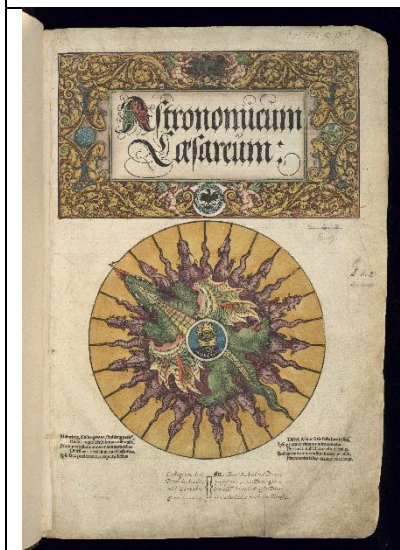


M3r



O6r

Peterhouse College, Cambridge (PC)



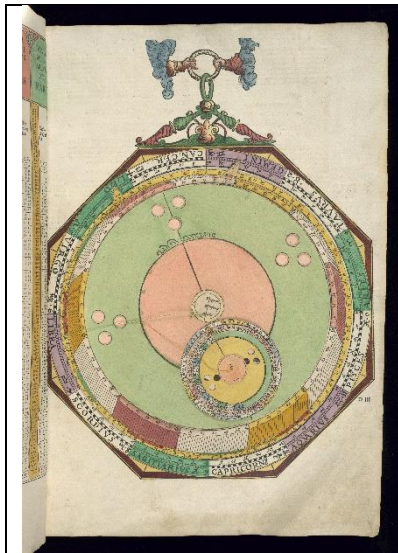
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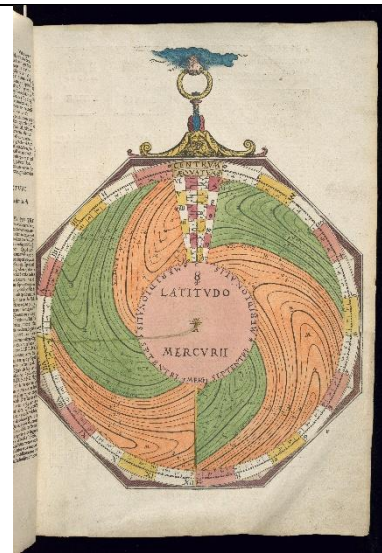
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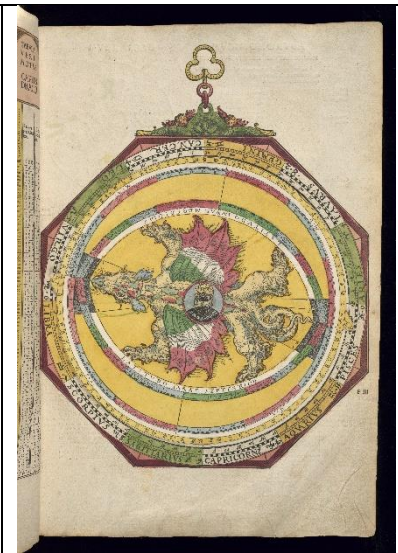
B3r



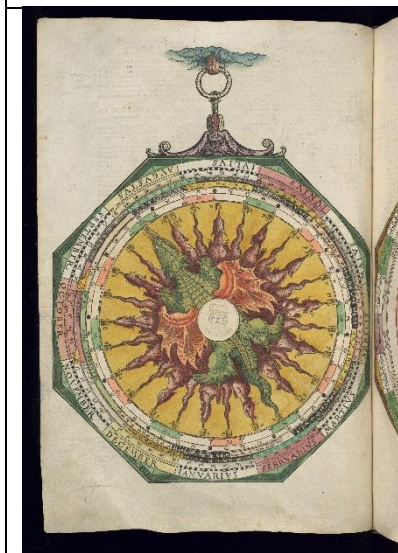
D3r



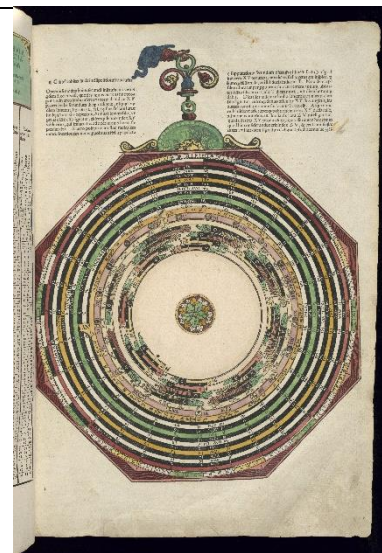
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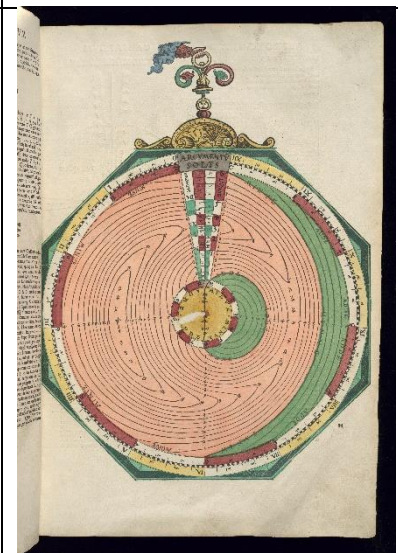
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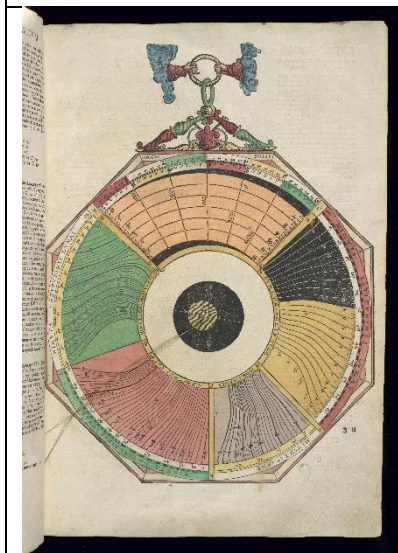
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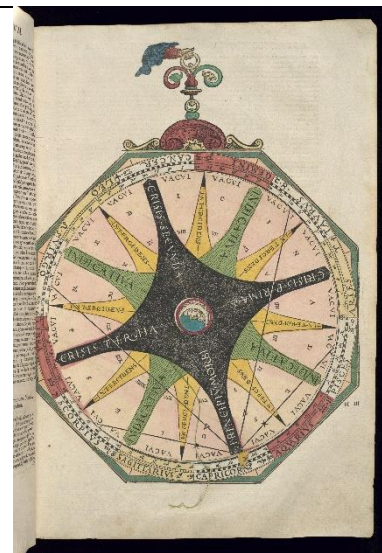
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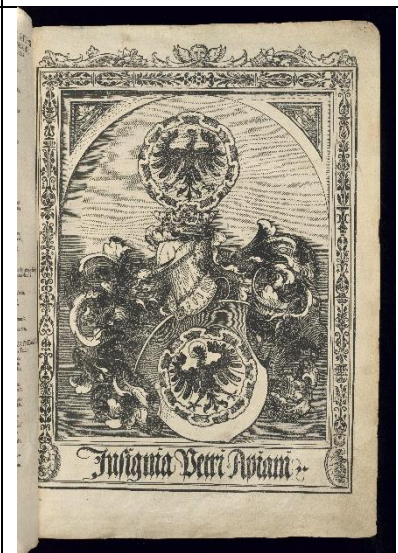
H1r



I2r



M3r

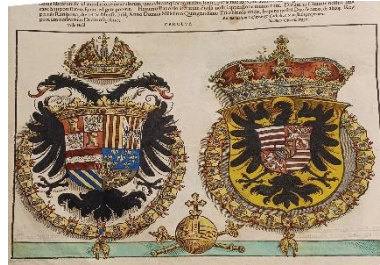


O6r

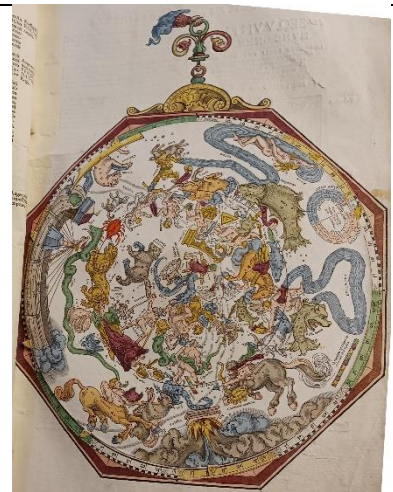
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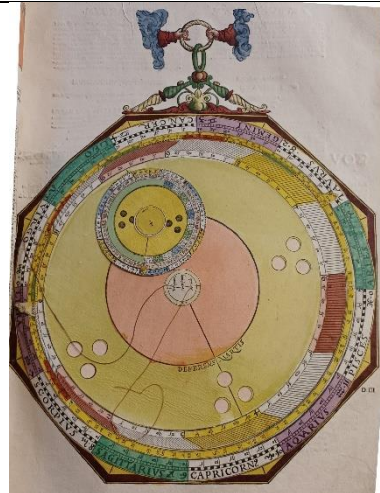
A1R



A1v



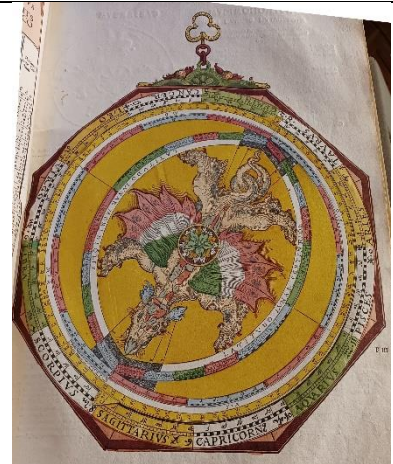
B3r



D3r



F1r



F3r



G3v



G4r



H1r



I2r



M3r

British Library, London (BL)



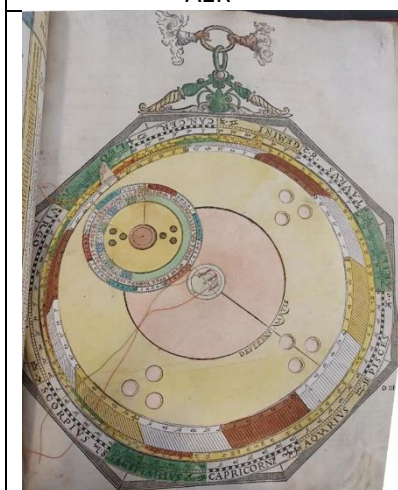
A1R



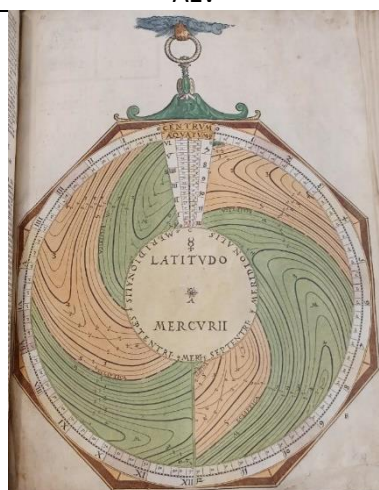
A1v



B3r



D3r



F1r



F3r



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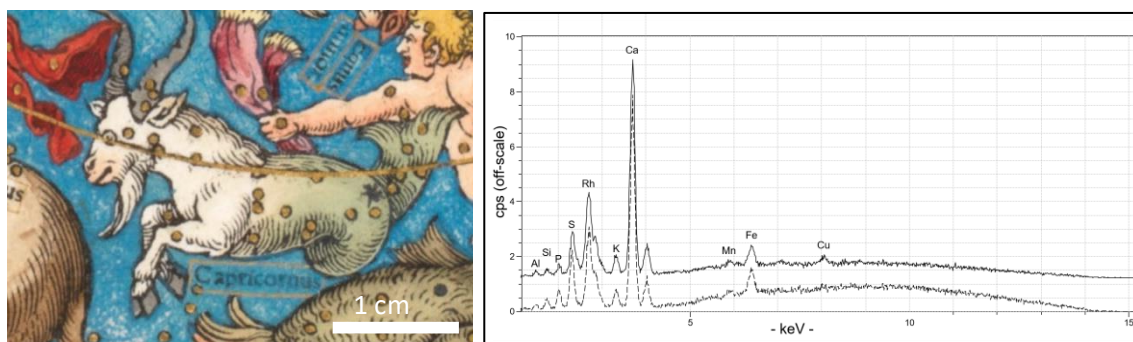


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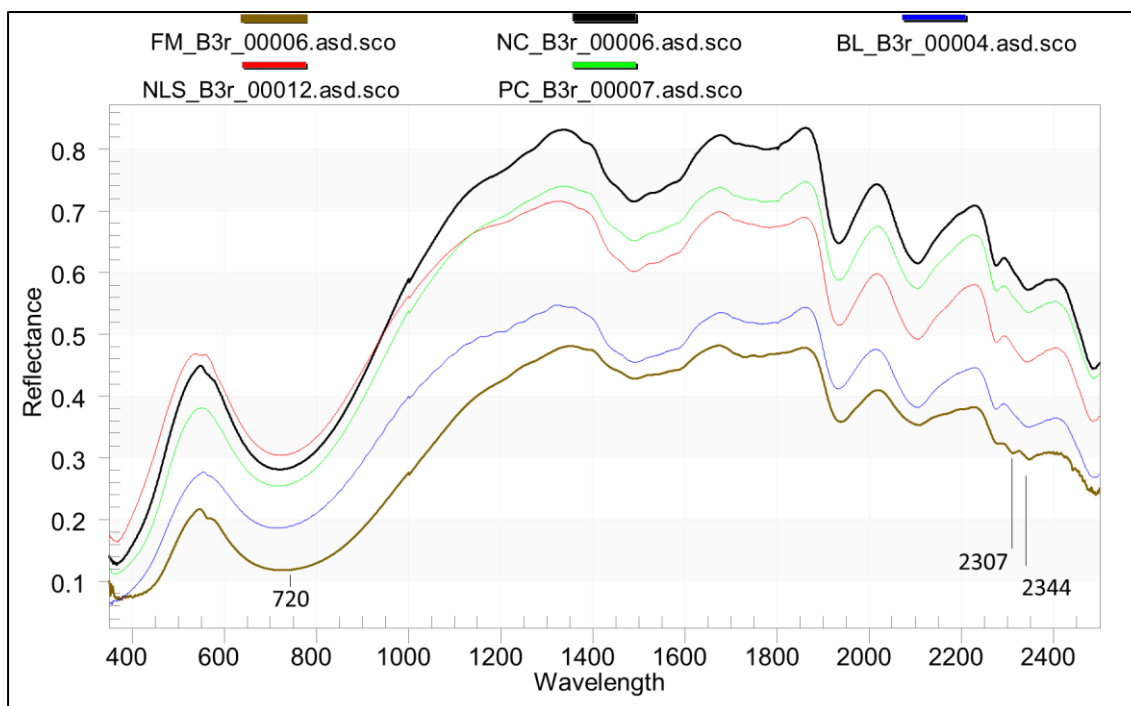


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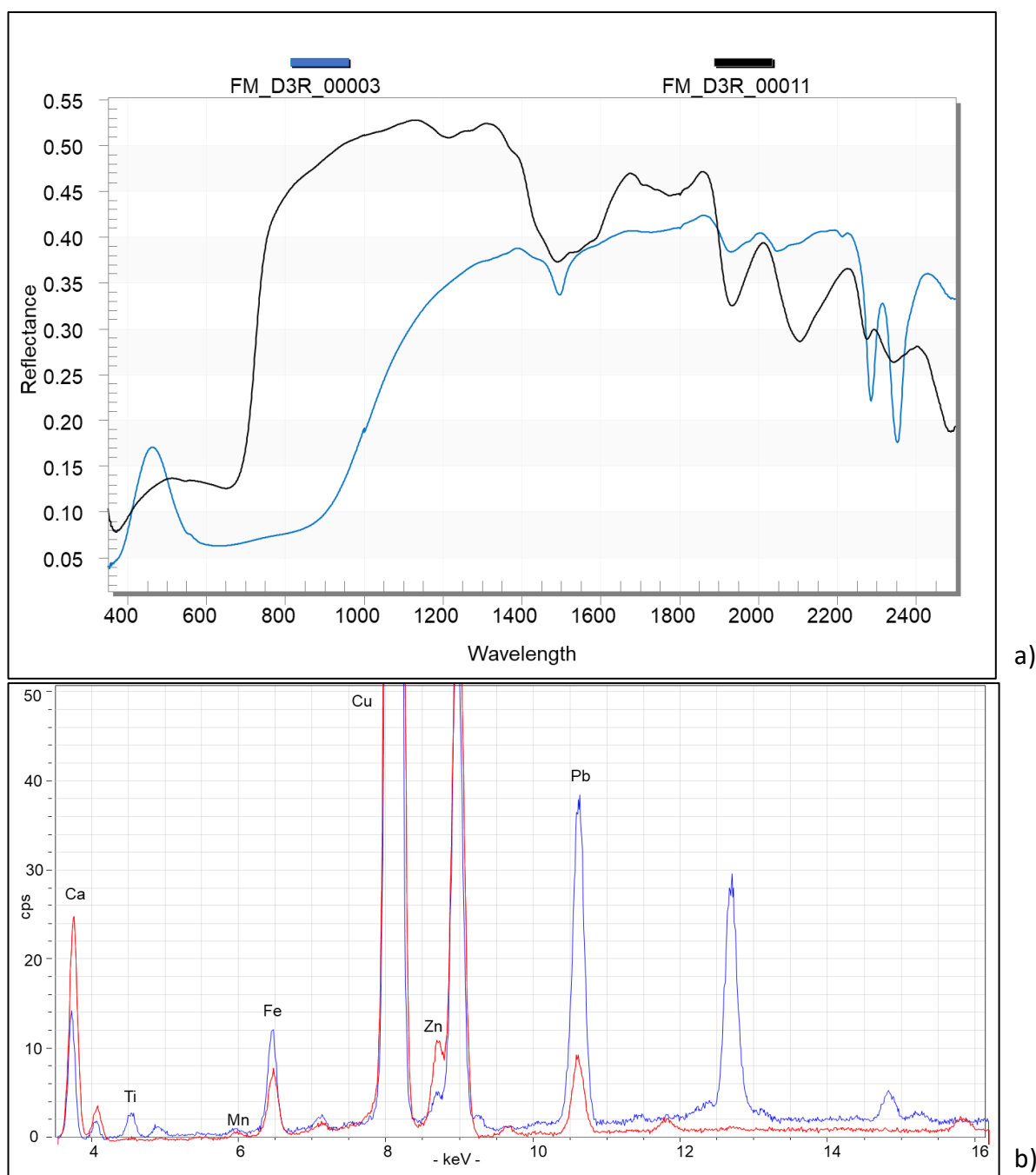


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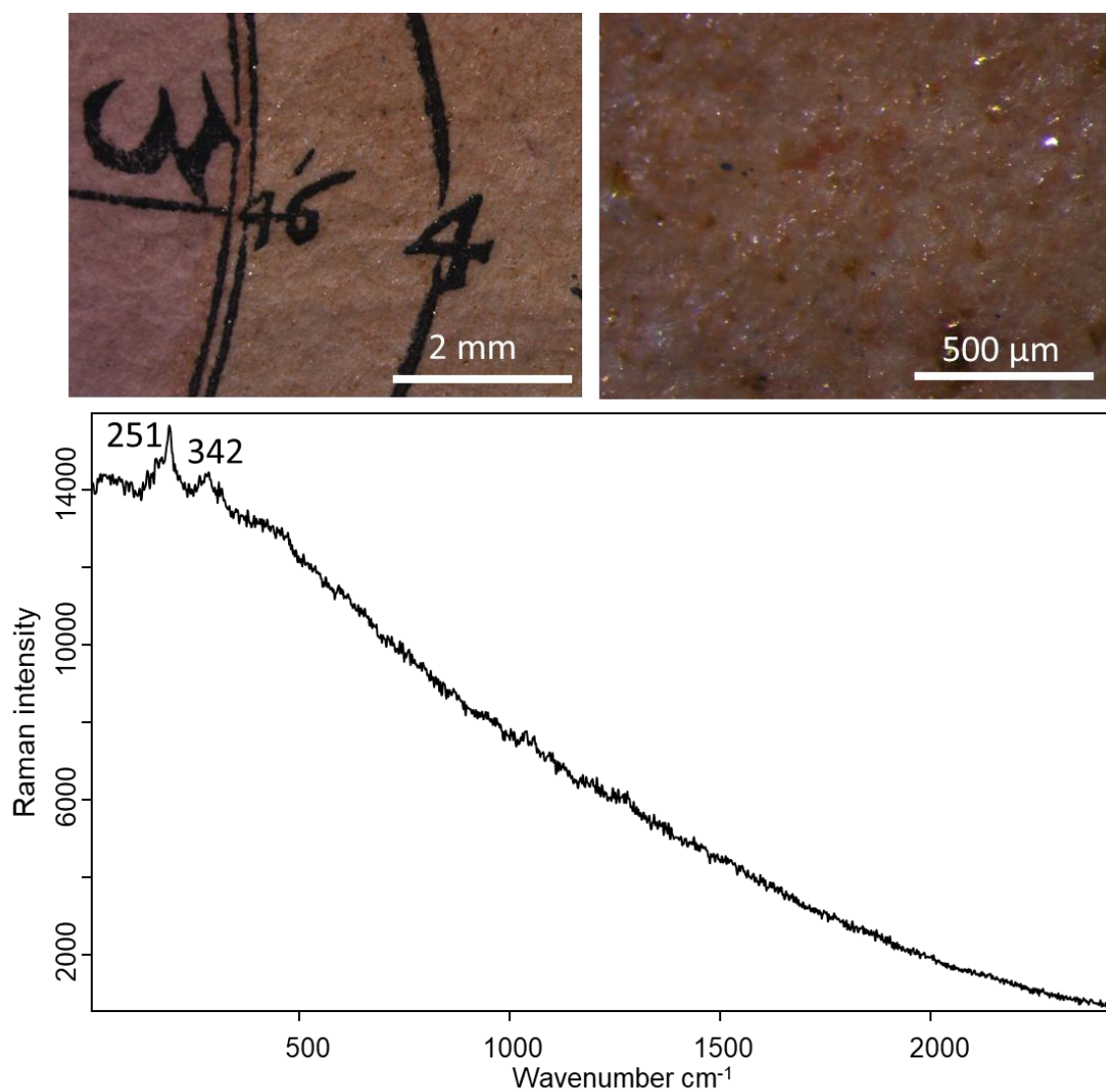


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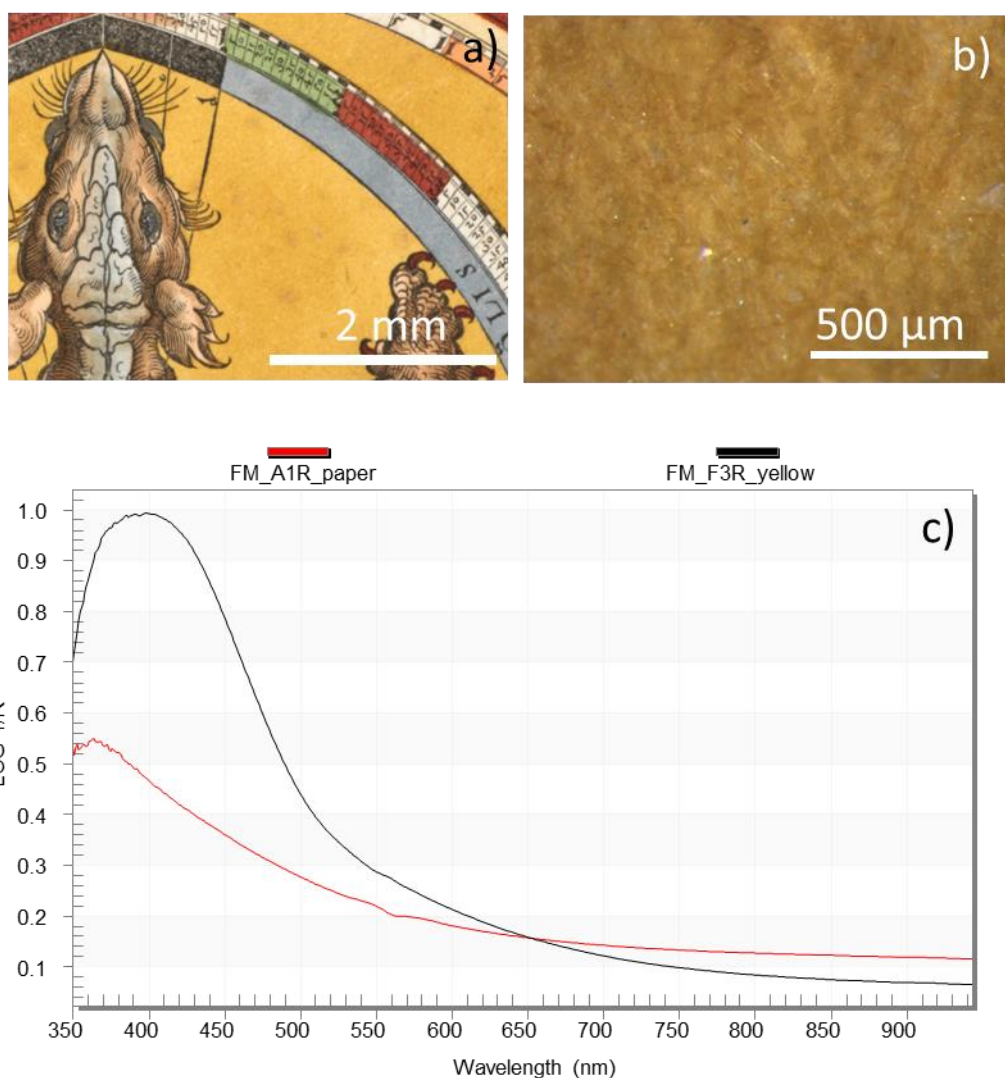


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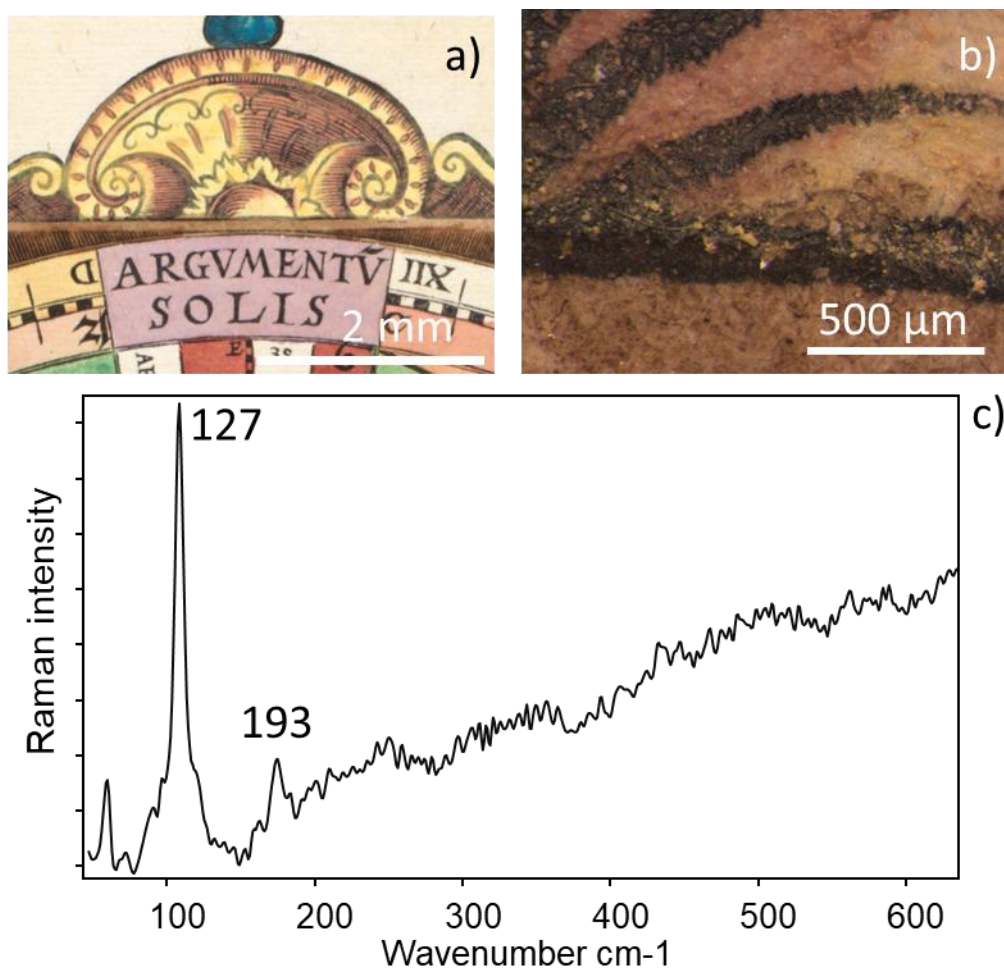


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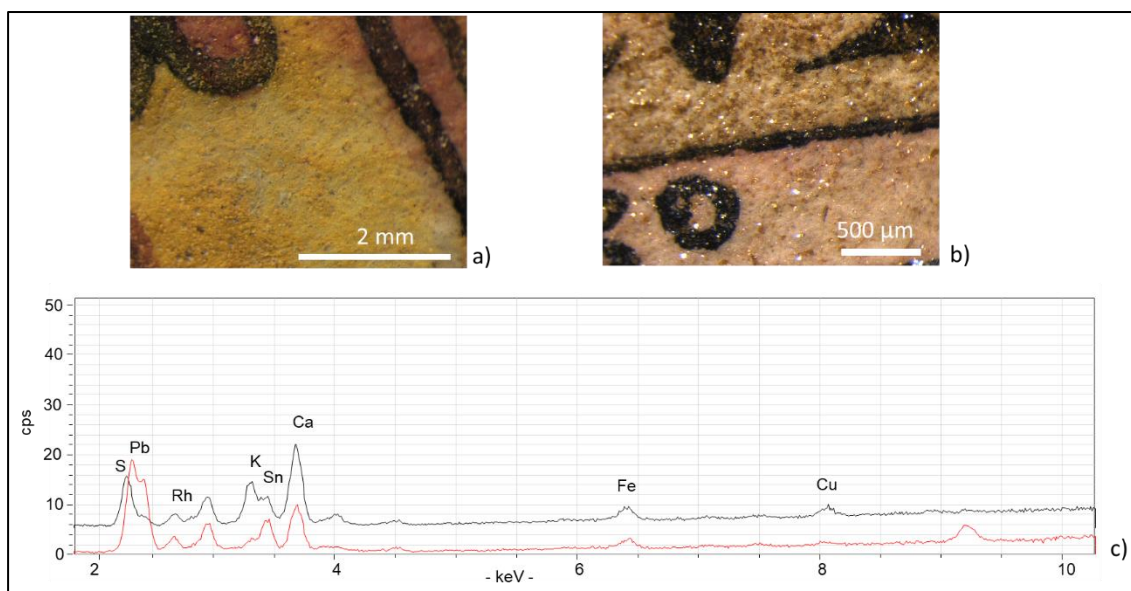
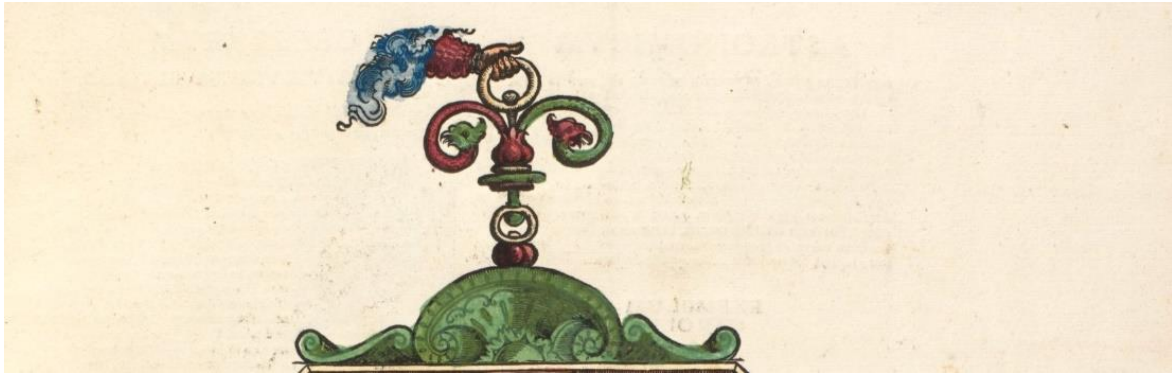


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a) Fitzwilliam Museum (FM), PB 18-2020.



b) National Library of Scotland (NLS), Newb.4968.



c) Peterhouse College, Cambridge (PC), S.9.

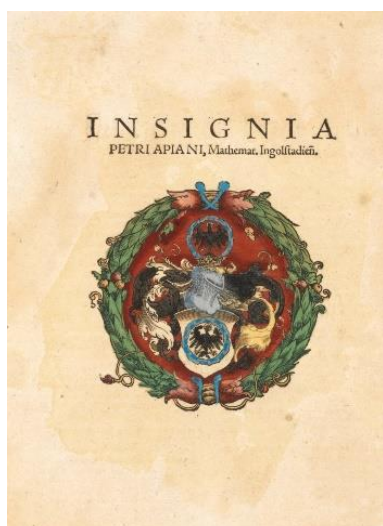


d) New College Library, Oxford, BT1.70.2



e) British Library (BL), Maps C.6.d.5.

Figure S-9. Changes on G4r: the text is a) absent (FM), b) pasted in (NLS) or c) printed (PC, NC, BL). Images reproduced © The Fitzwilliam Museum, University of Cambridge and by kind permission of the BL, by courtesy of the Warden and Scholars of New College, Oxford, by The Master and Fellows of Peterhouse, Cambridge, and the National Library of Scotland.



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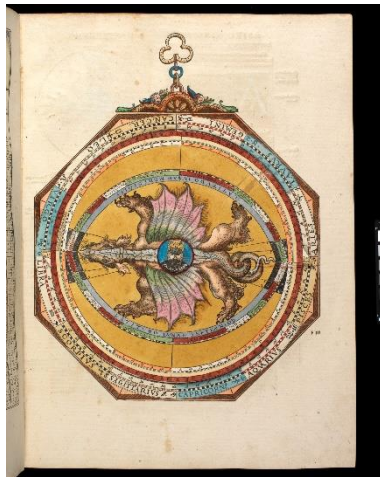


b) Peterhouse College,
Cambridge (PC)



c) National Library of
Scotland (NLS)

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a) Fitzwilliam Museum

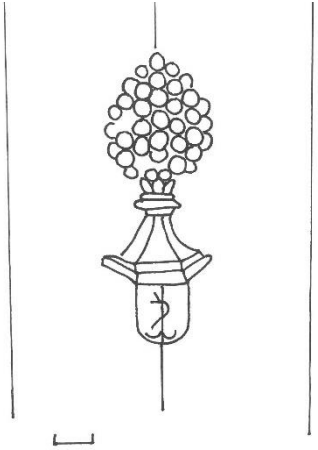
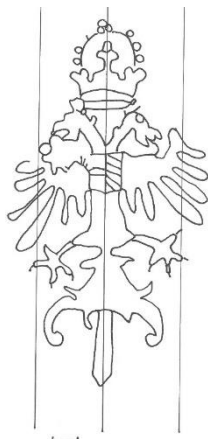
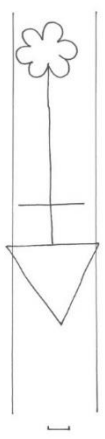


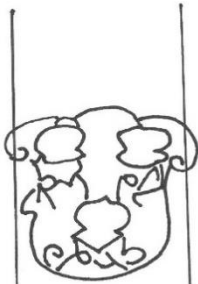
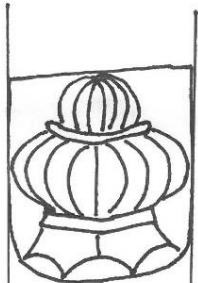
b) Peterhouse College, Cambridge

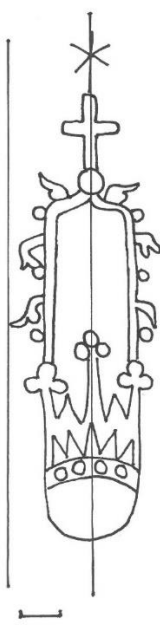
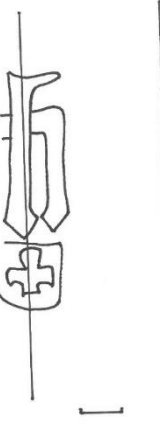


Figure S-11. Dragon volvelle painted on folio F3r. In the FM book (a), the pigments and shading are carefully applied, compared to a less precise application in the Peterhouse copy (b). Image reproduced © The Fitzwilliam Museum, University of Cambridge and by kind permission of The Master and Fellows of Peterhouse, Cambridge.

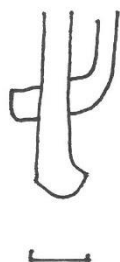
Table S-1. Watermarks found in copies of the AC examined in the course of this study. References are to the nearest published watermark or family of watermarks. Scale bar = 10mm.

Watermark	References
Pine cone and crest 	Briquet 2125
Imperial eagle 	Cf. Briquet 1459
Flower and triangle 	Cf. Briquet 6485; Memory of Paper Ref. Number DE5580-Musms37_132

Tower, crown and flower 	Cf. Memory of Paper Ref. number DE8085-PO-100911
Crest with three hats 	Cf. Briquet 1113 (Armoiries, Cerf)
Salt-cellar 	Cf. Briquet 2174 (Armoiries, Sablier)

Bear 	Cf. Briquet 12307, 12308 (Ours)
Crown with gothic arch, cross and star 	Cf. Memory of Paper Ref. number DE-KKDD-A130328 for similar design
Letter with crest 	Cf. Briquet 8771 (Lettre P)

Letter 'p'



N.B. This is a partial watermark, impossible to trace in full due to its position in the volvelle wheel, but likely to approximate to:



Cf. Briquet 8791, 8795, 8797 (Lettre P)

Table S-2. Distribution of the blue pigments in the folios analysed on each copy. The asterisk indicates that only a visual examination has been carried out.

	Fitzwilliam Museum PB 18-2020	National Library of Scotland Newb.4968	Peterhouse College, Cambridge S.9	New College, Oxford BT1.70.2	British Library Maps C.6.d.5
A1r	azurite	azurite	azurite, indigo	azurite	indigo
A1v	azurite	azurite	azurite	azurite	indigo
B3r	azurite	azurite	azurite, indigo	indigo + azurite, indigo	indigo, smalt (discoloration)
C1r		azurite	indigo + azurite	azurite, indigo?	smalt (discoloration)
C3r	azurite, indigo,	azurite, indigo	indigo + azurite, indigo	indigo + azurite	indigo
C4r	azurite, indigo				
C4v	azurite		indigo*		
D1r	azurite	azurite	azurite	azurite, indigo	indigo + azurite, indigo
D2r	azurite		indigo*	indigo	
D2v					indigo
D3r	azurite indigo	azurite	azurite, indigo	indigo	indigo
E1r	azurite	azurite	indigo + azurite, indigo	indigo	indigo
E2r	azurite, indigo	azurite, indigo	indigo*	azurite, indigo	indigo
E3r			indigo + azurite	indigo + azurite	smalt* (discoloration)
E4r	azurite, indigo	azurite, indigo	indigo + azurite, indigo	indigo	indigo
F1r	azurite, indigo	azurite	azurite	azurite	indigo
F2r	azurite, indigo		indigo	azurite, indigo	indigo, azurite
F2v		azurite, indigo			
F3r	azurite, indigo	azurite	indigo	indigo	indigo
F3v	azurite	azurite			
F4r	azurite		indigo*	indigo	indigo
G1r	azurite, indigo		indigo*	azurite, indigo	indigo
G2r	azurite, indigo		indigo*	indigo	indigo
G3r			azurite?, indigo		
G3v	azurite, indigo + azurite	azurite, indigo		indigo	indigo + azurite, indigo
G4r	azurite, indigo	azurite, indigo		smalt, indigo	smalt, indigo
G4v			azurite		

G5r	azurite, indigo	azurite, indigo	indigo + azurite	azurite	indigo, indigo
H1r	azurite	azurite	indigo + azurite	indigo + azurite	indigo
H2r	azurite, indigo	indigo	indigo	indigo	indigo, azurite
H3r	indigo	indigo	indigo	indigo	indigo + azurite
H4r	azurite	azurite	indigo*	indigo	indigo
I1r	azurite	azurite	indigo*	indigo	indigo
I2r	azurite	azurite	indigo + azurite	indigo + azurite	indigo + azurite, indigo
K3r	azurite, indigo	azurite, indigo	indigo + azurite	indigo + azurite	indigo, smalt (discoloration)
K4r	azurite, indigo	azurite, indigo	indigo*	indigo	indigo
L1r	indigo		azurite	azurite, lead white	
L2r	azurite			azurite (boss)	
L3r	azurite		indigo + azurite	indigo + azurite	indigo (boss)
L4r	azurite, indigo	azurite, indigo	indigo*	indigo	indigo
M1r	azurite		azurite, indigo	azurite, indigo	azurite, indigo
M3r	azurite	azurite	azurite, indigo	indigo + azurite	azurite
N1r	azurite				indigo
O6r	azurite, indigo	azurite, indigo			