

Data Mining and Classical Manuscripts

Peter Heslin

IDAS and Classics

30 September 2019



Study	Colleges & student experience	Research & business	Alumni	Global Durham
Department of History				
You are in: Durham University ⇨ Department of History ⇨ Research ⇨ Research Areas ⇨ British Medieval Illuminators' Pigments				

[History](#)

[About Us](#)

[Undergraduate Study](#)

[Postgraduate Study](#)

[Research](#)

[Research Areas](#)

[Region](#)

[Period](#)

[Themes](#)

[Alumni](#)

[People](#)

[Equality and Diversity](#)

British Medieval Illuminators' Pigments



Pigments project

Background

The ravishing colours of illuminated manuscripts are one of the most vivid legacies of the Middle Ages. Yet discovering what was used to achieve these effects is a challenging task. Although medieval recipe collections provide useful guidance about materials and techniques in general, they do not reveal what was deployed in any particular instance. To understand this, scientific examination of the manuscripts themselves is crucial. Deploying a range of non-invasive technologies that are wholly appropriate from a conservation point of view, and using a unique, custom-built, fully mobile suite of equipment optimised for the study of manuscripts, the team is examining a representative sample of British books dating from the seventh to the fifteenth centuries and identifying the pigments used therein. These data, taken in tandem with codicological and art-historical study of the manuscripts in question, provide a genuinely new perspective on eight centuries of British book production, art, and culture, offering new insights into the cultural contexts and international connections of monastic illuminators and professional scriptoria. One path-breaking result will be the first ever account of

British medieval illuminators' pigments and their cultural significance.

SHARE



DNA recovered from old parchment

By [Elizabeth Pennisi](#) | Dec. 8, 2014 , 1:45 PM

It's not easy to find ancient DNA. Weathering and bacterial contamination of fossils, for example, can make it tough to recover enough pure, intact genetic material. Now, researchers have tapped a new source of ancient DNA: parchment. Genetic material obtained from two pieces of parchment, one from the 1600s and one from the 1700s, show that sheep provided the paper's starting material and that over that century, a big shift occurred in the breed of sheep used in that part of the United Kingdom—from a scrappier, highlands, black-faced variety to a meatier, lowland breed. For centuries, civilizations have relied on the stretched, dried, and scraped hides of goats, sheep, pigs, and cows as “paper” to record their goings-on. Previous attempts to get DNA from parchment did not work well, **but by using modern sequencing techniques, researchers can now get abundant livestock DNA from parchment**, such as the 16th century deed from Lancashire, U.K., shown above, the team reports online today in the *Philosophical Transactions of the Royal Society B*. Not only is parchment plentiful, but as a legal document, it also has been carefully stored and often dated, making it a more readily available source of ancient DNA than bones. True, genetic material from parchment isn't going to shed much light on human evolution, but the scientists say it could reveal the history of agriculture over the past 700 years as well as eventually inform historians about where and when a particular parchment document was made, the researchers note.

SCIENCE

The Lab Discovering DNA in Old Books

Even the beeswax used in seals is rich with data about the past, including the flowers that grew in that region year to year

SARAH ZHANG FEB 19, 2019



Manuscripts

This article is more than 3 months old

Groundbreaking astronomer Kepler 'may have practised alchemy'

Analysis of Kepler's manuscripts finds high levels of metals used in a pseudoscience still practised in the 16th and 17th centuries

Alison Flood

Thu 13 Jun 2019 17:14 BST

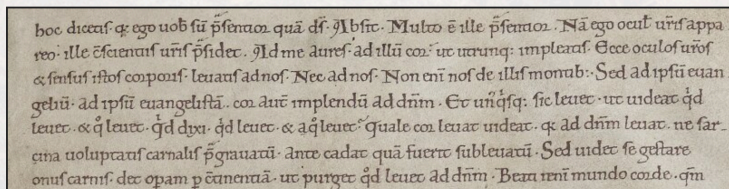


404



OCR Samples

Durham Cathedral Library MS. B.II.16 - Augustine, In Iohannis Evangelium, page f.4r



OCR Results

hoc dicetis qꝛ ego uob sū p̄sentior quā d~ A bsit. Multo ē ille p̄sentior. Nā ego ocul uřis appa
re ille c̄scientiis uřis p̄sident. Ad me aures ad illū cor. ut utrunq; impleatis. Ecce oculos uros
et sensus istos corporis. leuatis ad nos. Nec ad nos. Non enī nos de illis montib;. Sed ad ipsū euan
geliū ad ipsū euangelistā. cor aut implendū ad dñm. Et ui q̄sq; sic leuet. ut uideat qđ
leuet. et q̄ leuet. qđ dixi. qđ leuet. et a q̄ leuet ? Quale cor leuat uideat. qꝛ ad dñm leuat. ne sar
cina uoluptatis carnalis p̄grauatū ante cadat quā fuerit subleuatū. Sed uidet se gestare
onus carnis. det opam p̄ tinentiā ut purget qđ leuet ad dñm. Beati menī mundo corde. qm̄

OCR Results (expanded abbreviations)

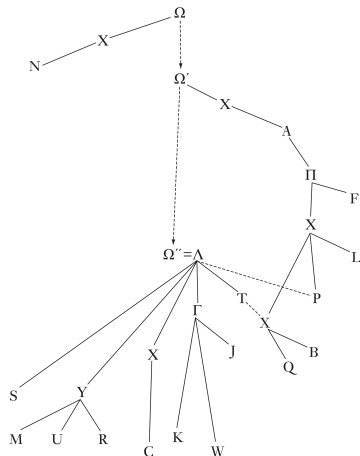
hoc dicetis *quia* ego uobis *sum* praesentior quam d~ A bsit. Multo *est* ille praesentior. Nam ego ocul *uestris* appa
re ille *conscientiis* *uestris* praesidet. Ad me aures ad *illum* cor. ut utrunq; impleatis. Ecce oculos uros
et sensus istos corporis. leuatis ad nos. Nec ad nos. Non *enim* nos de illis *montibus*. Sed ad *ipsum* euan
geliū ad *ipsum* euangelistam. cor aut implendū ad *dominum*. Et ui *quisque* sic leuet. ut uideat *quid*
leuet. et *qui* leuet. *quid* dixi. *quid* leuet. et a *quo* leuet ? Quale cor leuat uideat. qet ad *dominum* leuat. ne sar
cina uoluptatis carnalis *prae*grauatū ante cadat *quam* fuerit subleuatū. Sed uidet se gestare
onus carnis. det *operam* *per*tinentiam ut purget *quod* leuet ad dñm. Beati menī mundo corde. qm̄

C. SALLUSTI CRISPI

CATILINAE CONIURATIO

- 1 Omnis homines, qui sese student praestare ceteris
animalibus, summa ope niti decet, ne vitam silentio
transeant veluti pecora, quae natura prona atque ventri 5
2 oboedientia finxit. sed nostra omnis vis in animo et
corpore sita est: animi imperio, corporis servitio ma-
gis utimur; alterum nobis cum dis, alterum cum be-
3 luis commune est. quo mihi rectius videtur ingeni
quam virum opibus gloriam quaerere, et quoniam vita 10
ipsa qua fruimur brevis est, memoriam nostri quam
4 maxume longam efficere. nam divitiarum et formae
gloria fluxa atque fragilis est, virtus clara aeternaque
habetur.
5 Sed diu magnum inter mortalis certamen fuit, vine 15
corporis an virtute animi res militaris magis proce-
6 deret. nam et prius quam incipias consulto et ubi
7 consulueris mature facto opus est. ita utrumque per

2 De titulo vide *Ag* 155 sqq. 3 omnis homines **Char.*
gramm. I 140, 17 *Diom. gramm.* I 305, 20 omnis . . . student *Prisc.*
gramm. II 358, 15 omnis . . . praestare *Non.* p. 371, 11 omnis . . .
animalibus *Char.* *gramm.* I 140, 1 *Eugraph.* *Ter. Eun.* 232
. omneis *Char.* omnes *Eugraph.* qui . . . animalibus *Arus.*
gramm. VII 508, 4 praestare ceteris animalibus *Diom. gramm.* I
313, 11 5 pecora . . . finxit *Arus. gramm.* VII 496, 27 quae
. . . finxit *Non.* p. 309, 11 *Victorin. rhet.* p. 160, 36 *Prisc.*
gramm. III 370, 18 ventri oboedientia *Sen. epist.* 8 (60), 4 oboe-
dientes *Sen.* 6 sed . . . sita est *Serv. Aen.* 2, 452 *georg.* I, 198
sed . . . utimur *Laet. inst.* 2, 12, 12 7 animi . . . utimur *Hier.*
ad Gal. 5, 16 p. 410 *ad Eph.* 5, 33 p. 537 animi . . . commune
est* *Hier. adv. Iovin.* 2, 10 *Aug. civ.* 9, 9 animae *Hier. adv. Iovin.*
8 utimur] vivere *Hier. ad Gal.* alterum nobis . . . commune est
Serv. Aen. 5, 81 9 videtur] esse videtur XNMTm videtur esse
BKHDFIsn 10 et . . . efficere *Victorin. rhet.* p. 160, 33 17 nam
. . . opus est *Don. Ter. Andr.* 334 *Prisc. gramm.* III 226 3 288, 17



A possible stemma of the Propertian tradition

Only MSS cited in the apparatus criticus are included. **X** indicates a lost hyparchetype not otherwise named; Greek capitals lost hyparchetypes cited in the apparatus criticus.

[previous](#)[next](#)[introduction](#)

Poem 1. [Corydon, Ornytus]

- C.** Nondum Solis equos declinis mitigat aestas,
quamvis et madidis incumbant praela racemis
et spument rauco ferventia musta susurro.
cernis ut ecce pater quas tradidit, Ornyte, vaccae
5 molle sub hirsuta latus explicuere genista?
nos quoque vicinis cur non succedimus umbris?
torrida cur solo defendimus ora galero?
- O.** Hoc potius, frater Corydon, nemos, antra petamus
ista patris Fauni, graciles ubi pinea denset
10 silva comas rapidoque caput levat obvia soli,
bullantes ubi fagus aquas radice sub ipsa
protegit et ramis errantibus implicat umbras.
- C.** Quo me cumque vocas, sequor, Ornyte; nam mea Leuce,
dum negat amplexus nocturnaue gaudia nobis,
15 pervia cornigeri fecit sacraria Fauni .
promove igitur calamos et si qua recondita servas;
nec tibi defuerit mea fistula, quam mihi nuper
matura docilis compegit arundine Ladon.
- O.** Et iam captatae pariter successimus umbrae.
20 sed quatenam sacra descripta est pagina fago,
quam modo nescio quis properanti falce notavit?
aspicis ut virides etiam nunc littera rimas
servet et arenti nondum se laxet hiatu?
- C.** Ornyte, fer propius tua lumina: tu potes alto
25 cortice descriptos citius percurrere versus ;



- A new way of visualizing manuscript differences on-screen and for automatically computing relationships between them.

- A new way of visualizing manuscript differences on-screen and for automatically computing relationships between them.
- A mechanism for training varied book-hands automatically, on the basis of a standard edition, ideally portable between languages.

- A new way of visualizing manuscript differences on-screen and for automatically computing relationships between them.
- A mechanism for training varied book-hands automatically, on the basis of a standard edition, ideally portable between languages.
- A way of reliably detecting anomalies, where the text in the manuscript differs from that in the standard edition.

- A new way of visualizing manuscript differences on-screen and for automatically computing relationships between them.
- A mechanism for training varied book-hands automatically, on the basis of a standard edition, ideally portable between languages.
- A way of reliably detecting anomalies, where the text in the manuscript differs from that in the standard edition.
- A machine-learning methodology in which the training data is unreliable, but in ways that can be categorized.