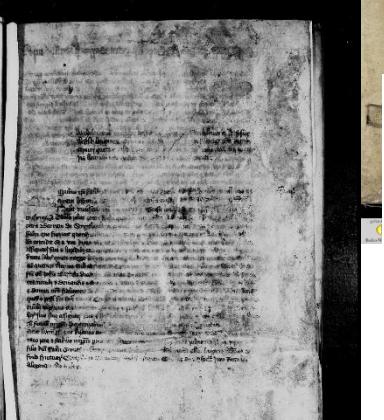




The Rest of the Story

Manuscript Fragments, Reused in Bindings, as Untapped Genealogical Sources

Opportunities for Family History and Manuscript Studies to Easily Provide Information for One Another, All with the Help of Machine Learning



Keith PRISBREY (FS Missionary)
David BLACK (FS Volunteer)
Family History Technology Workshop



27 February 2024

Check Current Version

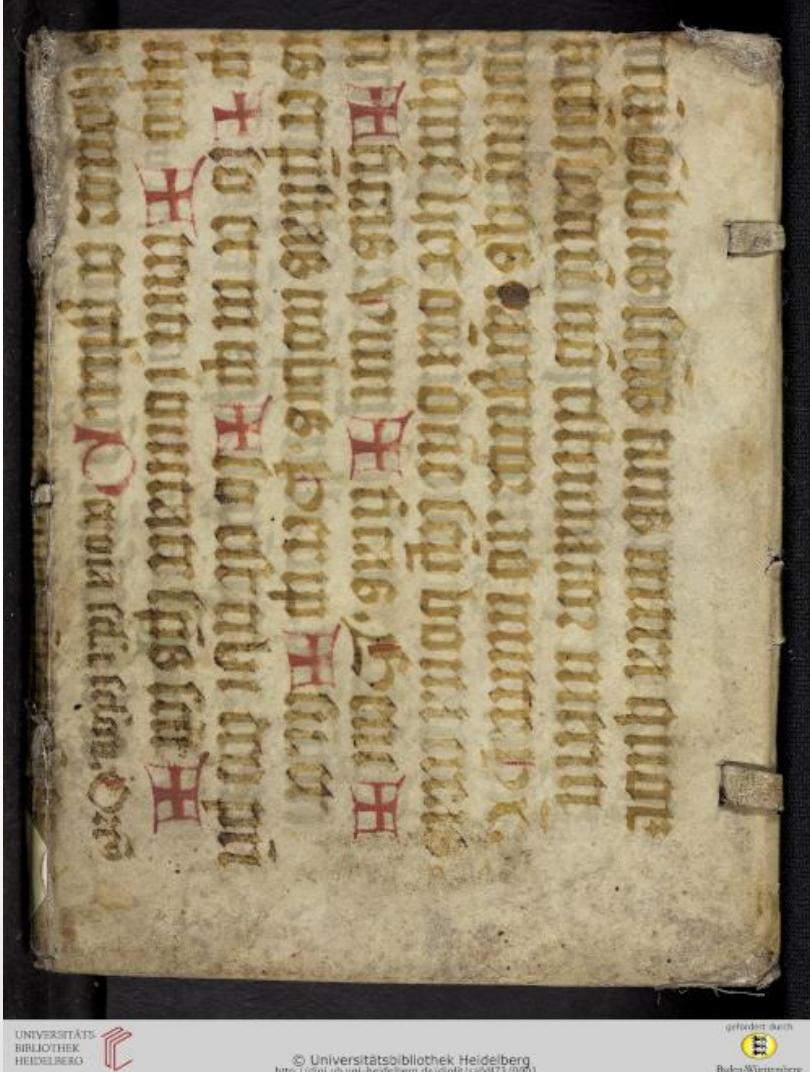
- The most current version of this **presentation** (the one now being given at FHTW 2024) can be found at Dave's Google Drive – shortlink
bit.ly/dk_rmf_pres
That's PDF.
- You can get the same place by scanning the giant QR code.



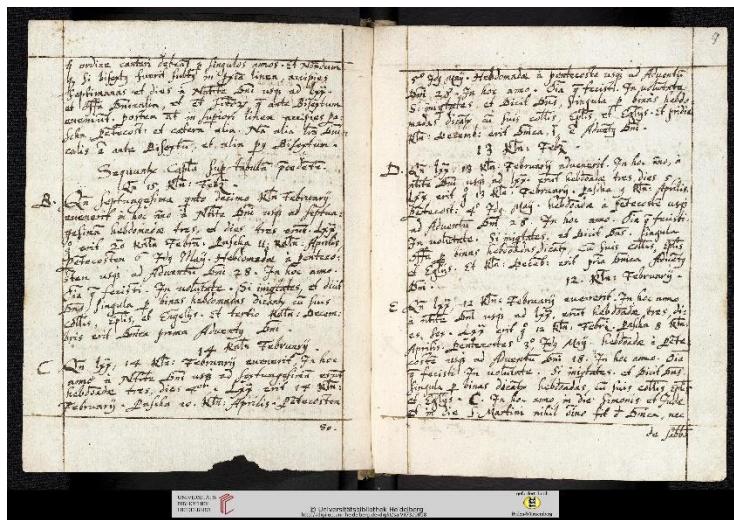
For the **paper**: bit.ly/dk_rmf_paper ; QR code in [backup slides](#)

Quick Taste

- To give you some idea what we're looking at, here



- Front cover/binding of a work, specifically a manuscript, called *Ordinarium cisterciense*, 17th century
- Cover is part of a completely different work – an unnamed missal from ~14th century



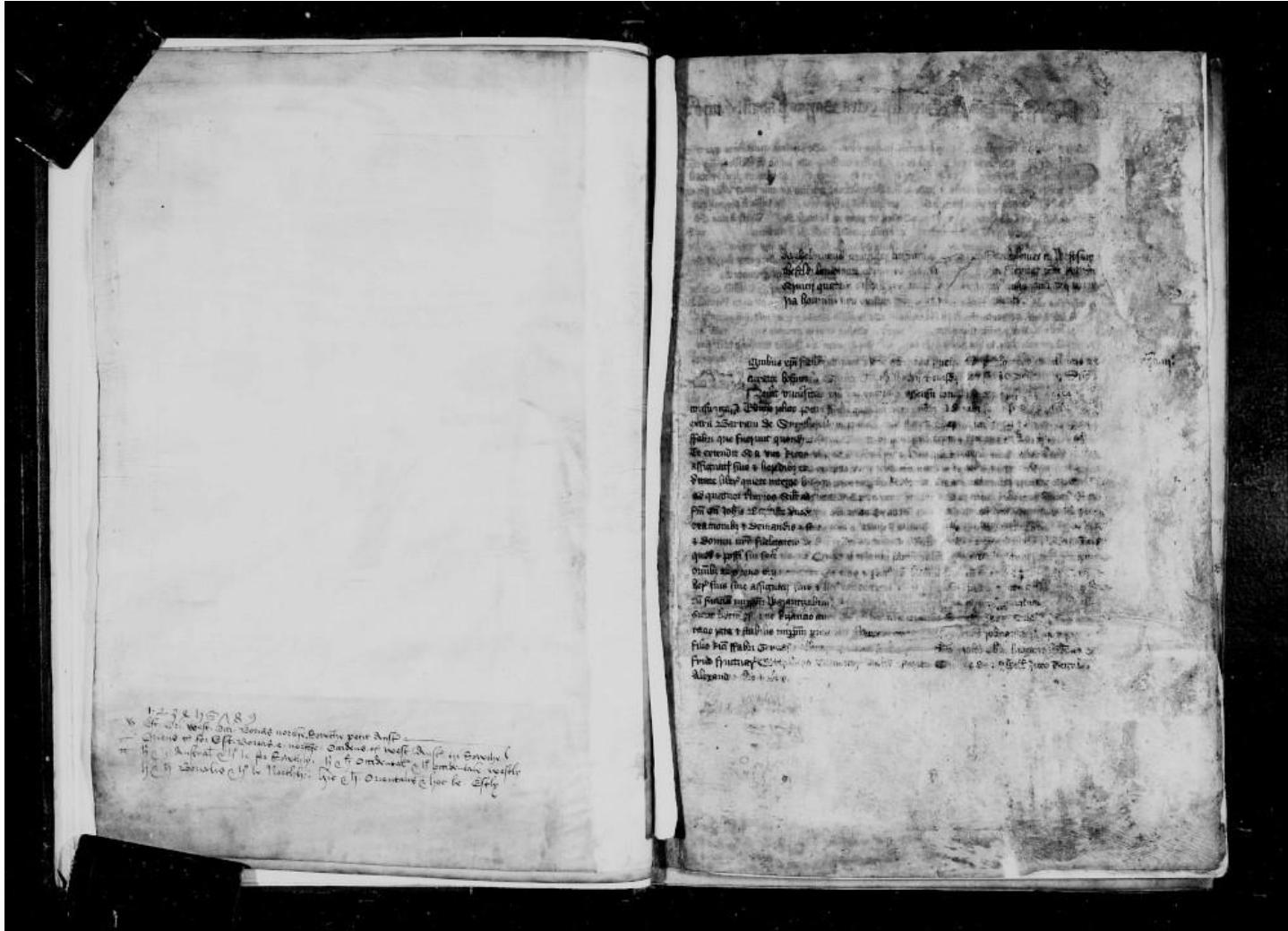
- Fragment text is typeset, not manuscript

Quick peek inside →

[3]

FH
TW

Quick Taste



- Flyleaf (protective last page) from a London hospital's register of lands and privileges granted by charter; In FamilySearch collections



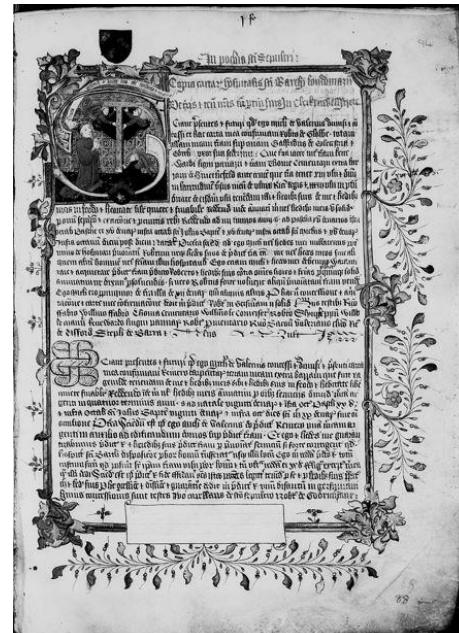
Quick Taste

Ff. 94 and 474 have illuminated borders and initials depicting the adoration of the Cross,

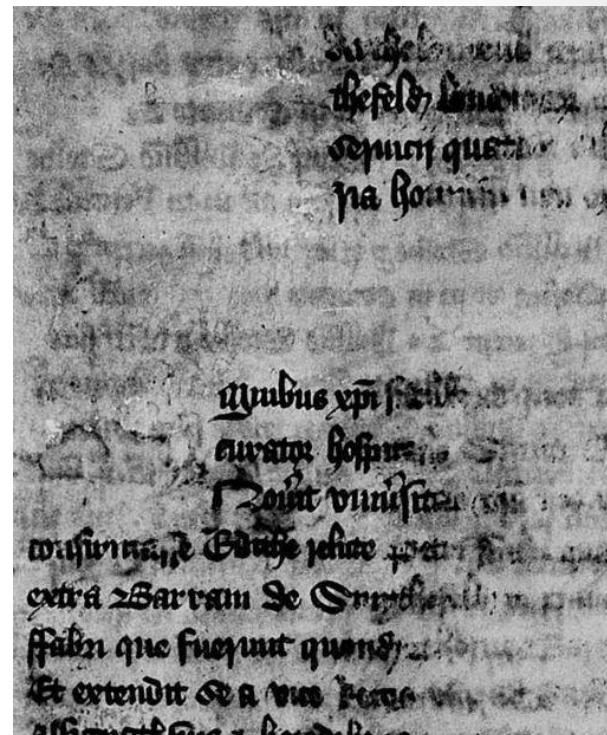


Not binding, but gold (or maybe silver)
Basically, just a really cool tangent

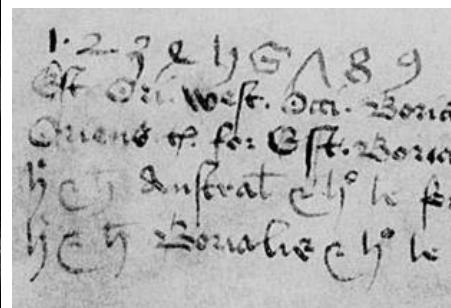
Interior page



LHS Flyleaf close-up



RHS Flyleaf close-up



TL;DR (Too Long; Didn't Read)

Three Main Points with a Plus-one and a Possible Bonus

1. Vast source of information in images of bindings on old books
 - * Includes genealogically-relevant data
 - * Previously found manually by practitioners of Manuscript Studies
 - probably long grad-student hours
 - not focused on gathering genealogical data
 - searches seem confined to university and state libraries
 - searches *haven't looked in genealogical databases*

TL;DR (Too Long; Didn't Read)

Three Main Points with a Plus-one and a Possible Bonus

2. Our Machine Learning Model can effectively find these data – we call them Reused Manuscript Fragments (RMFs) – from huge databases of document images, genealogical or otherwise

TL;DR (Too Long; Didn't Read)

Three Main Points with a Plus-one and a Possible Bonus

2. P.S. We have 43.8k files with document images relevant to this search (and similar ML searches to be discussed in the bonus)
 - * Carefully found and curated to focus on Reused Manuscript Fragments in bindings (and on the similar ML searches)
 - * Includes positive examples as well as negative, but care has been taken to include negative images very similar in all details to the positive examples but of course without text on the binding material
 - * Time only allowed the use of ~5k–10k of these images ...

TL;DR (Too Long; Didn't Read)

Three Main Points with a Plus-one and a Possible Bonus

3. Potential interdisciplinary work

- * Information in the genealogical databases includes text of interest to practitioners of manuscript studies.
- * Information in the Manuscript Studies databases include text of interest to practitioners of family history.
- * Let's help each other out
 - share our interesting finds with them – happy grad students
 - ask to use our models on their databases



TL;DR (Too Long; Didn't Read)

Three Main Points with a Plus-one and a Possible Bonus

+1. Don Quixote

- * What?!?!
- * Trust me on this one
 - Volume I, Chapter IX



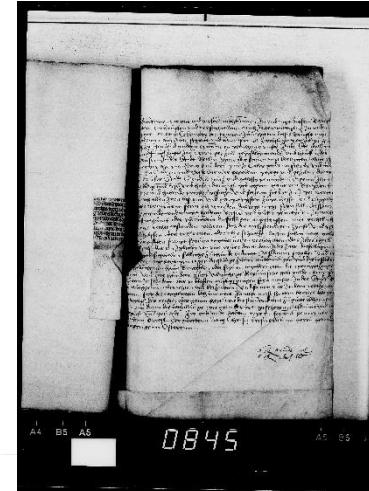
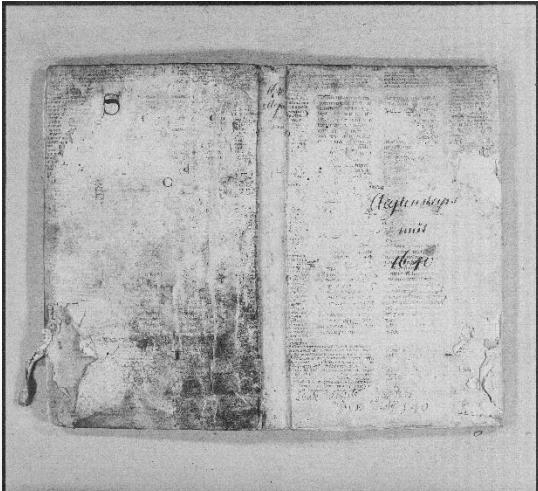
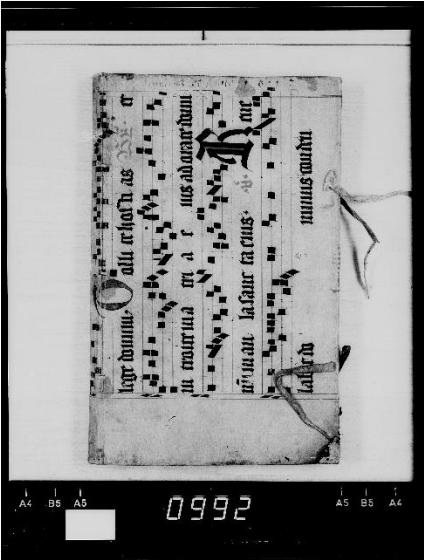
BONUS. Other relevant use cases for such a procedure

(10)

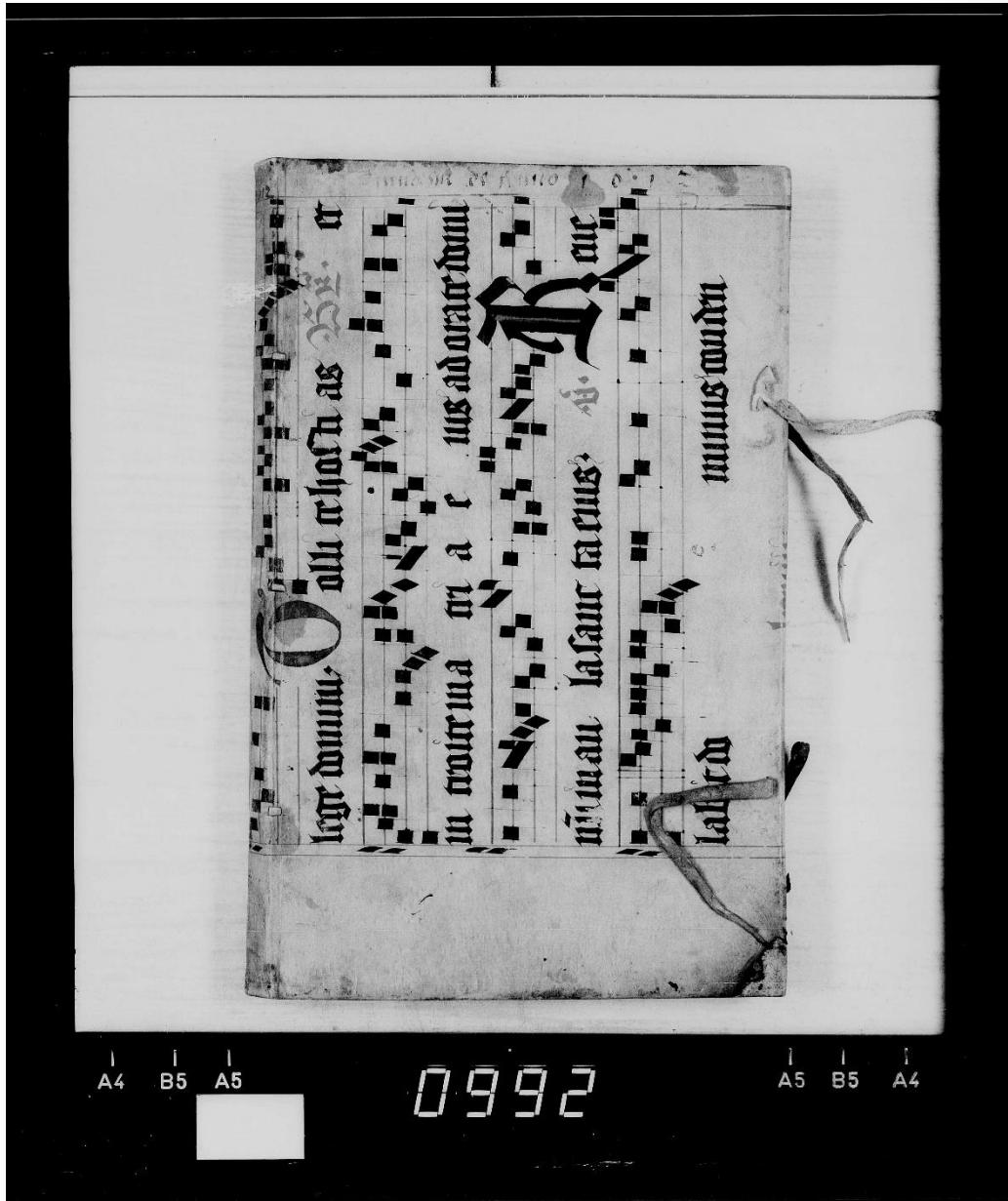
FH
TW

Some Reused Manuscript Fragments: Some RMFs

- We'll learn what we can find and why it even exists



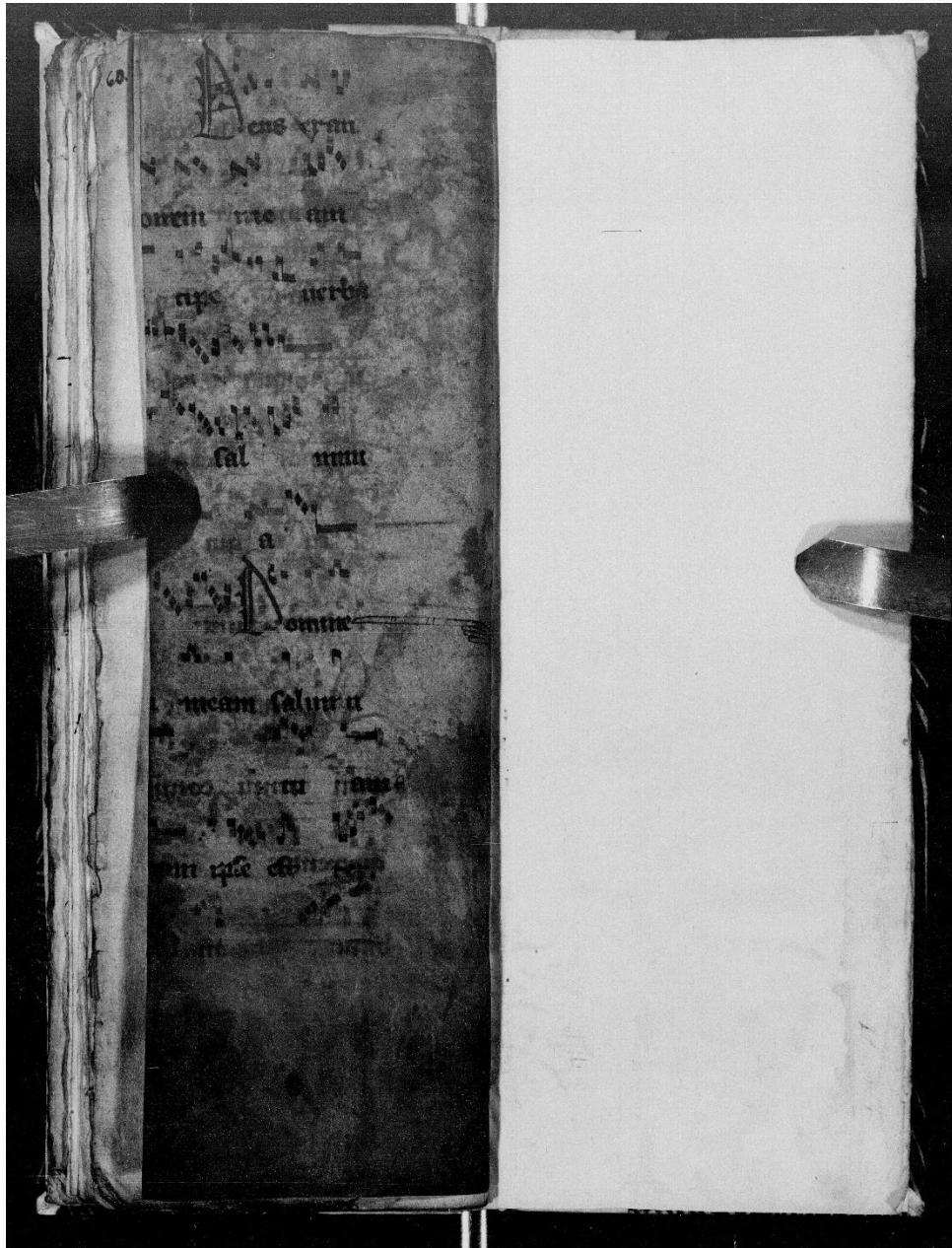
Some RMFs



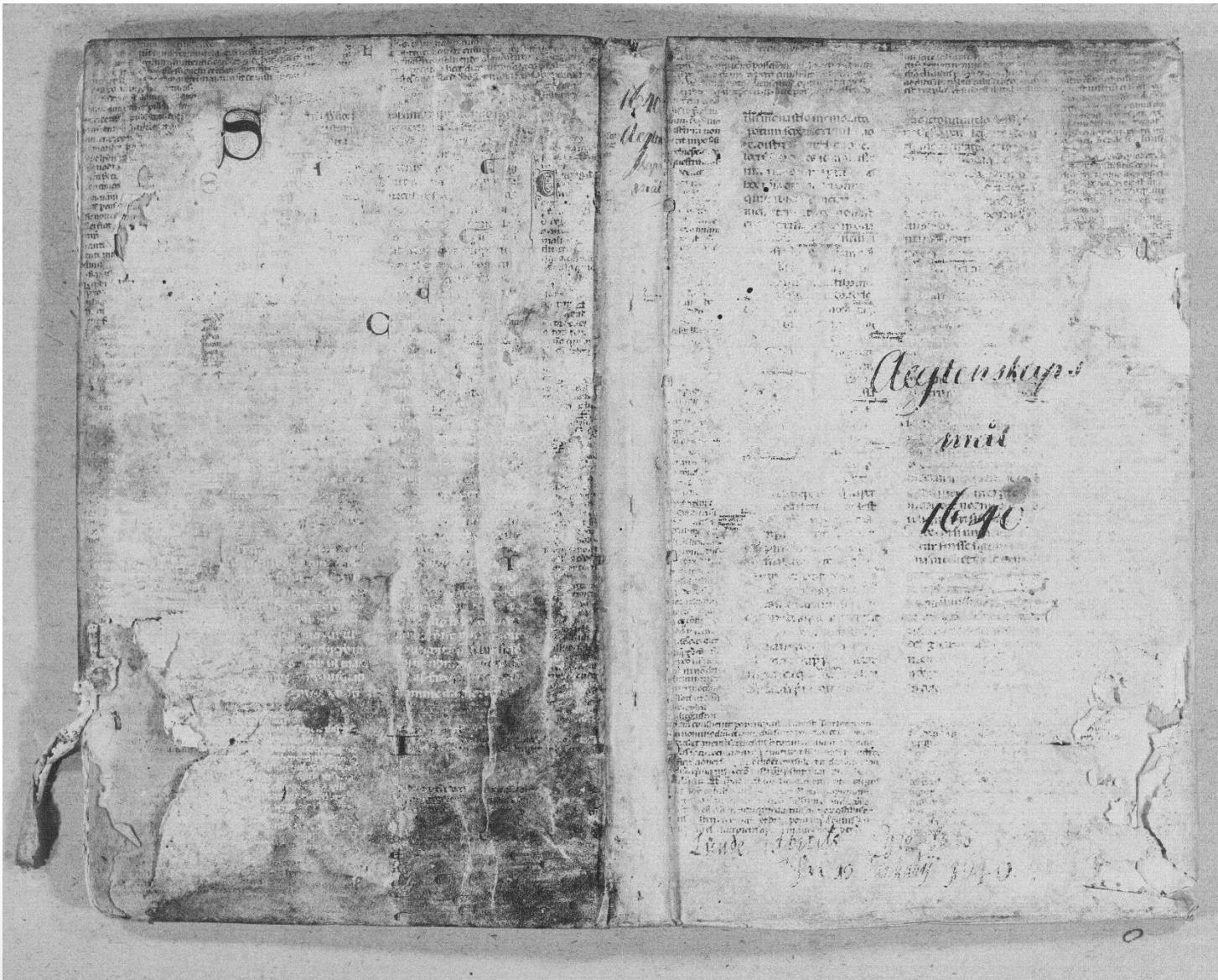
Some RMFs



Some RMFs



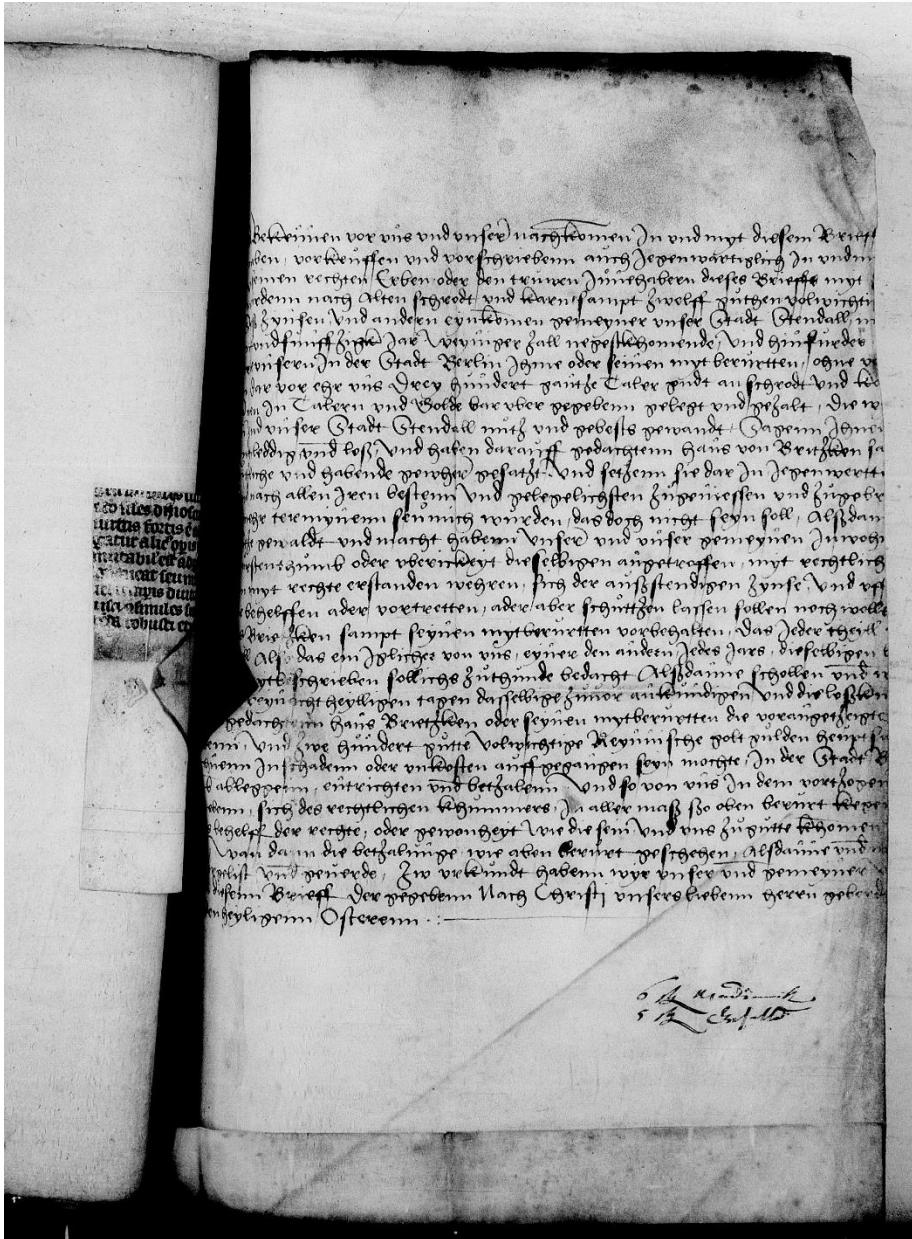
Some RMFs



Some RMFs



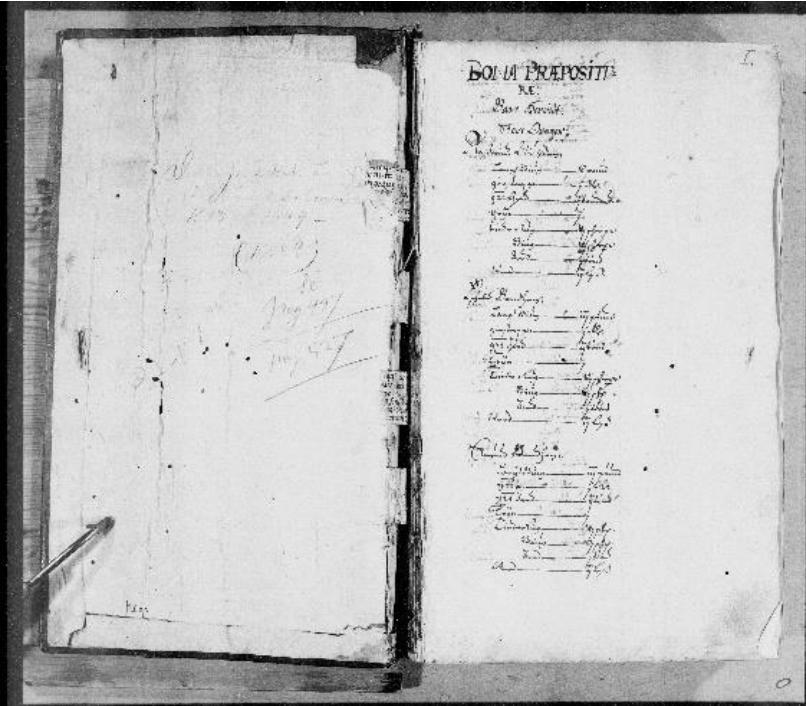
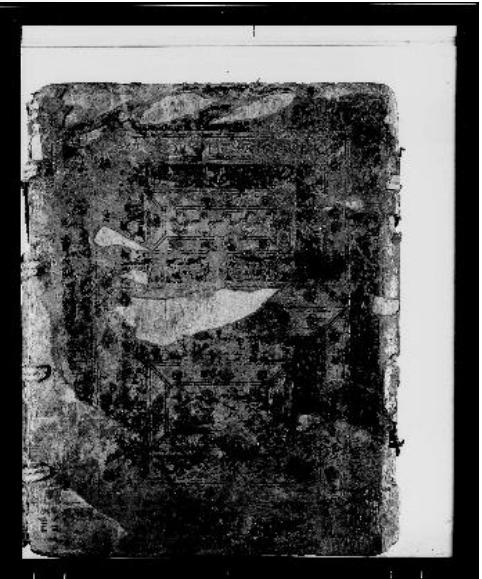
Some RMFs



Three More RMFs



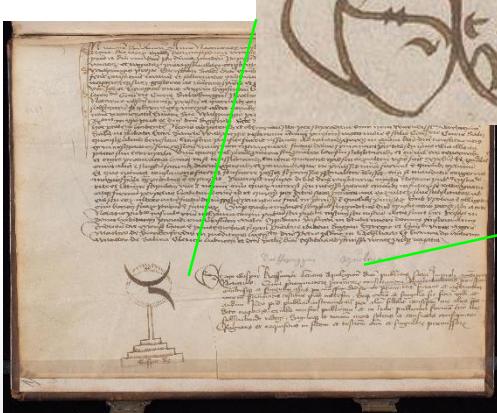
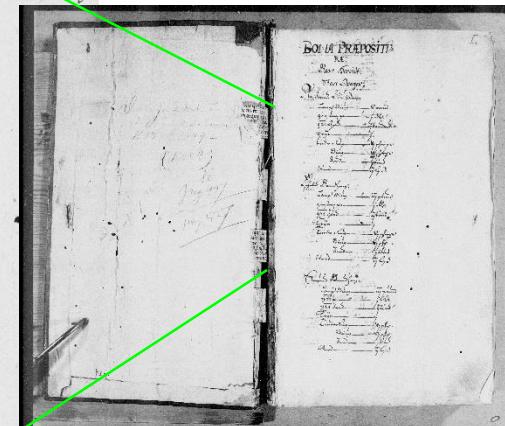
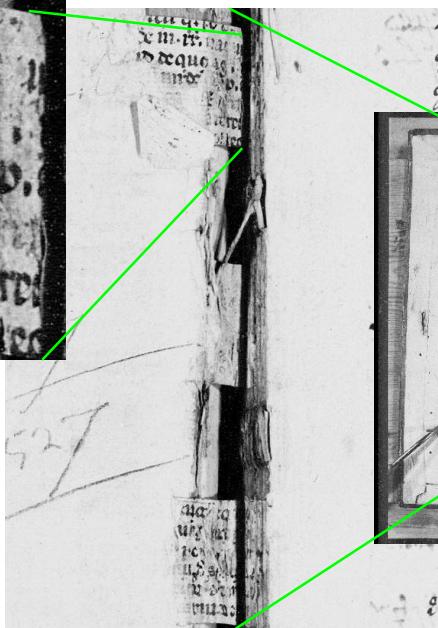
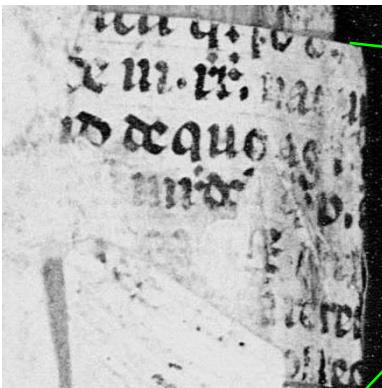
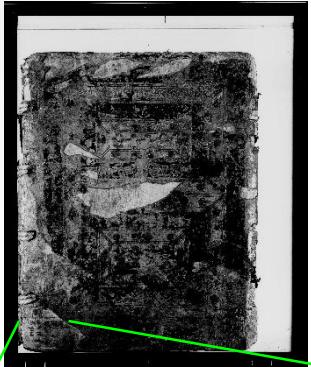
- Look closely



Three More RMFs

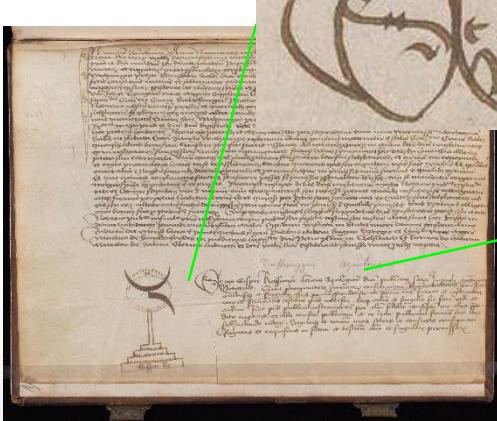
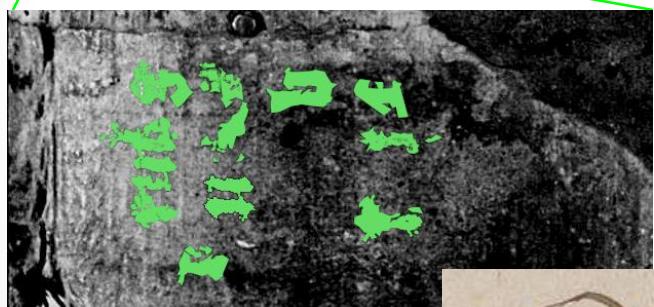
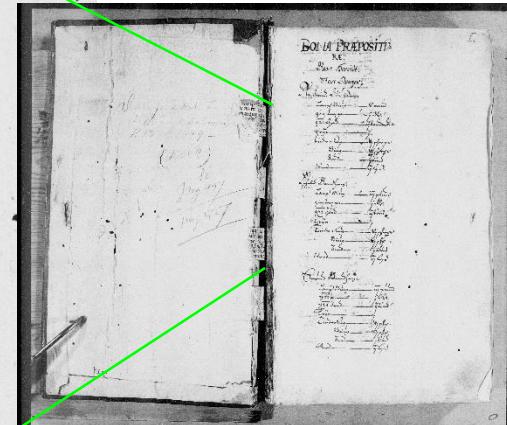
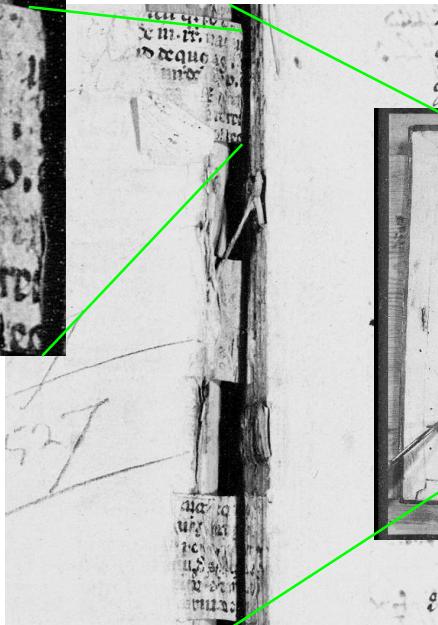
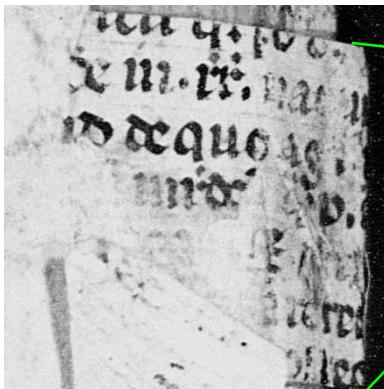
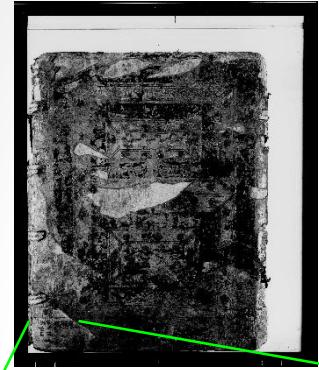


- Looking closely. You might have to look even more carefully.



*S*igis Gaspar Raffmeyer decanus aquilegiorum
Notarius, Quia pnominatori curatore

Three More RMFs



*S*t ego Gaspar Raffmuzer sacraus aquilegiorum
Notarius. Quia pnominatori pnvatore
...
...
...
...
...



Define Fragment



- part of a document which has been separated from the rest.
For our purposes, this will almost always be one page, one bifolium, or one part of a page or bifolium

or, less formally

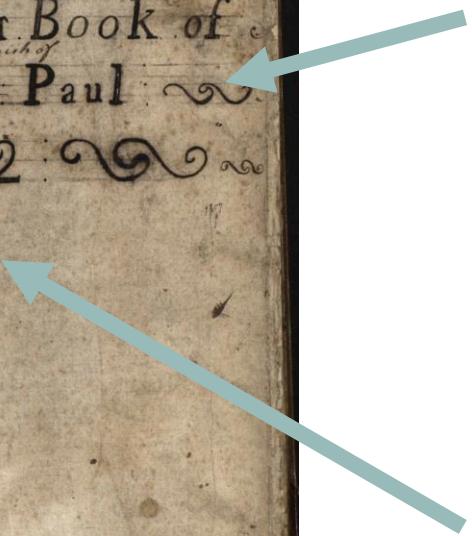
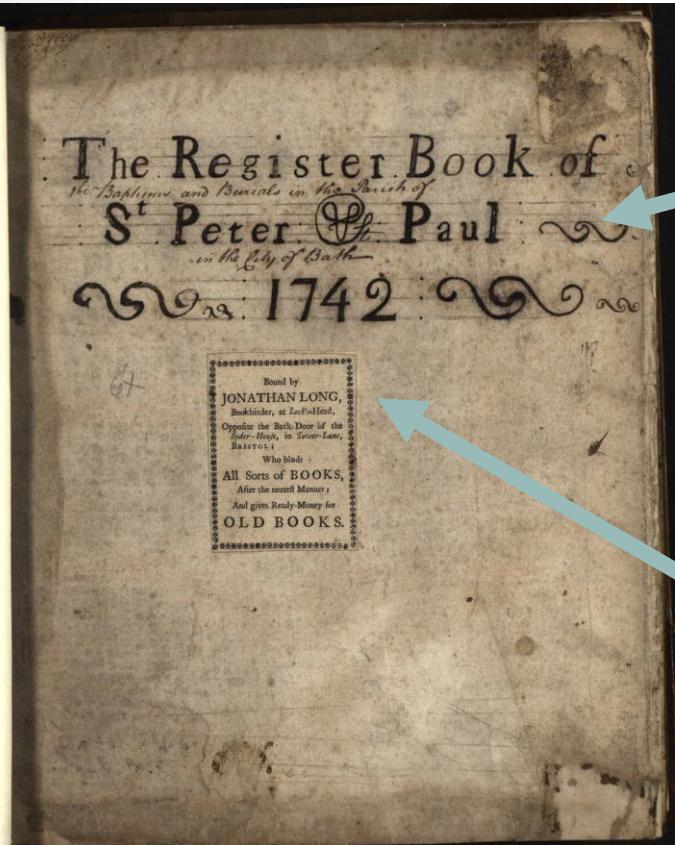
- a dismembered piece of a document

Define Manuscript



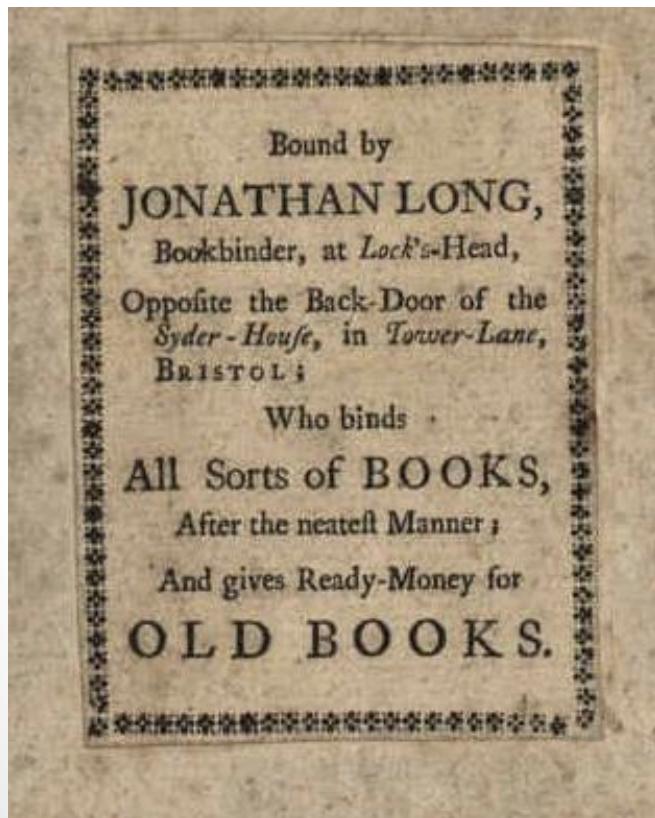
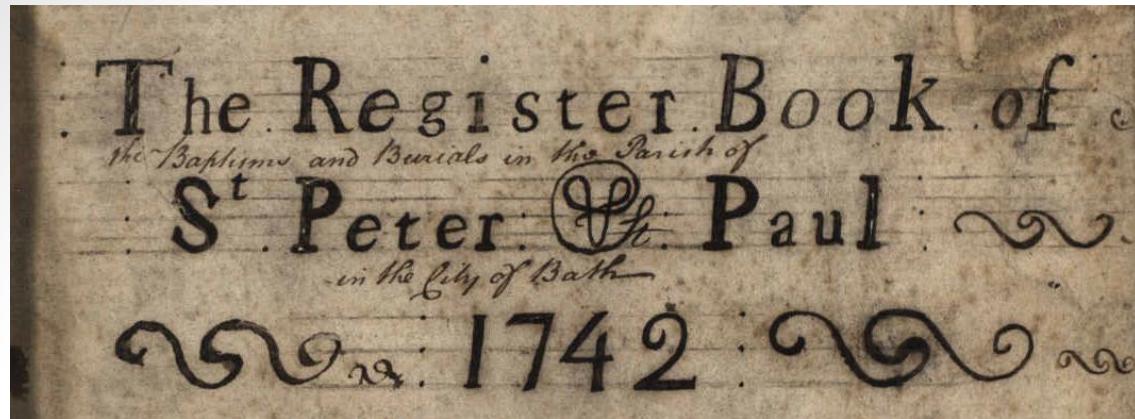
This is the manuscript part of the cover (the page is a cover).

The manuscript on this particular Register Book cover (the Register book is a manuscript) is very neat.



This is the non-manuscript part of the cover. Specifically, it's the printed part.

The printed text here is an ad.



(23)

Why Manuscript?

FH
TW



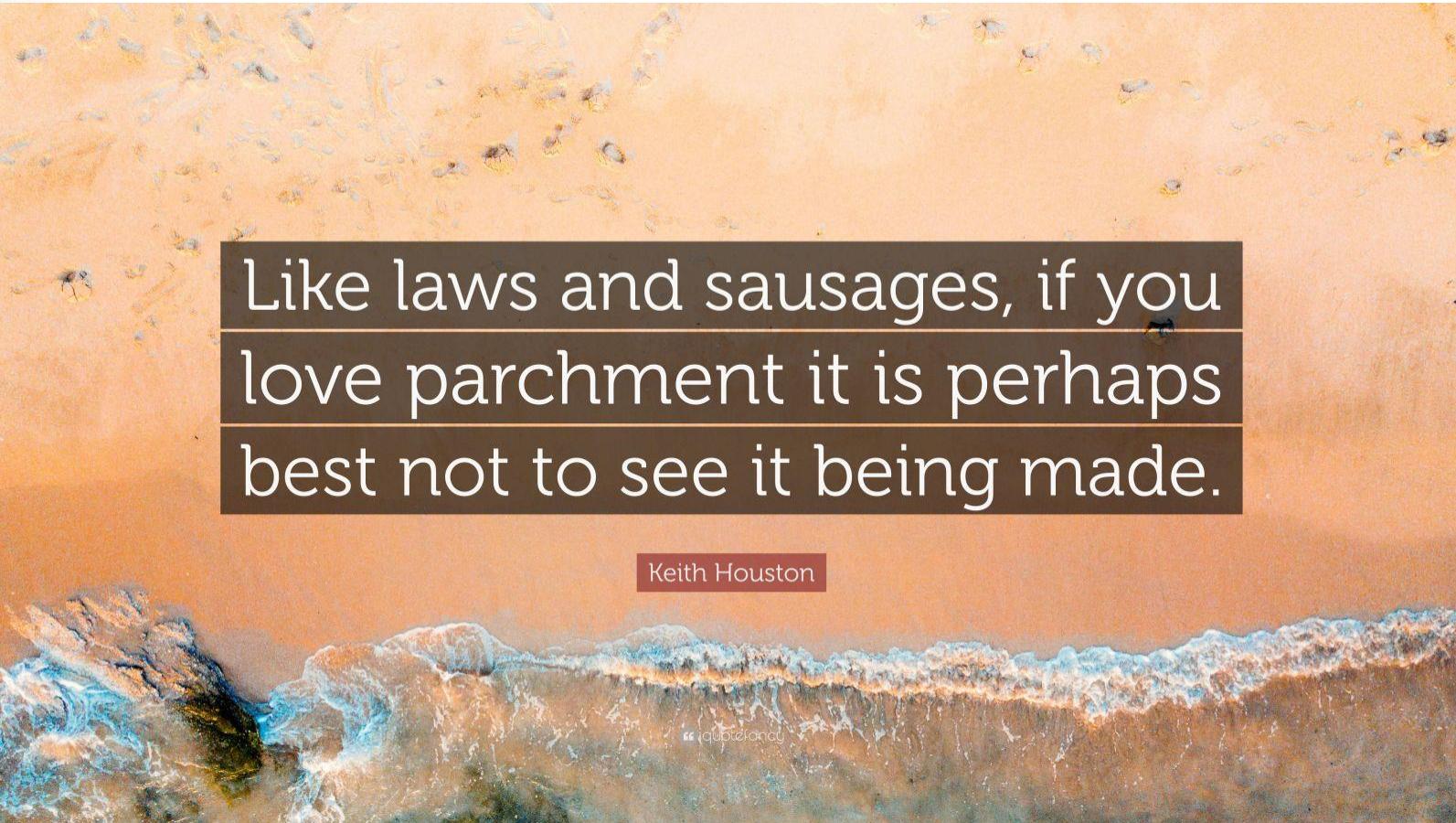
Don Quixote (?)

- There's the beginning of Don Quixote's adventures
- Narrator's aside (ChatGPT summary)

The suspenseful duel between the Biscayan and Don Quixote ends abruptly, as the narrator informs us that his initial source was missing pages. Fate intervenes in Toledo, where he finds a boy selling old, parchment manuscripts. Interesting Arabic texts and a translator are found.

- Cervantes tells us that the legendary adventures can continue; thanks to these pre-used manuscripts, we get **The Rest of the Story.**
- Let's find the rest of our ancestors' stories, and maybe it can be found "even [on] the torn pages from the streets."

Old, Parchment Manuscripts?



Like laws and sausages, if you
love parchment it is perhaps
best not to see it being made.

Keith Houston

"quotefancy"



Parchment is not Paper



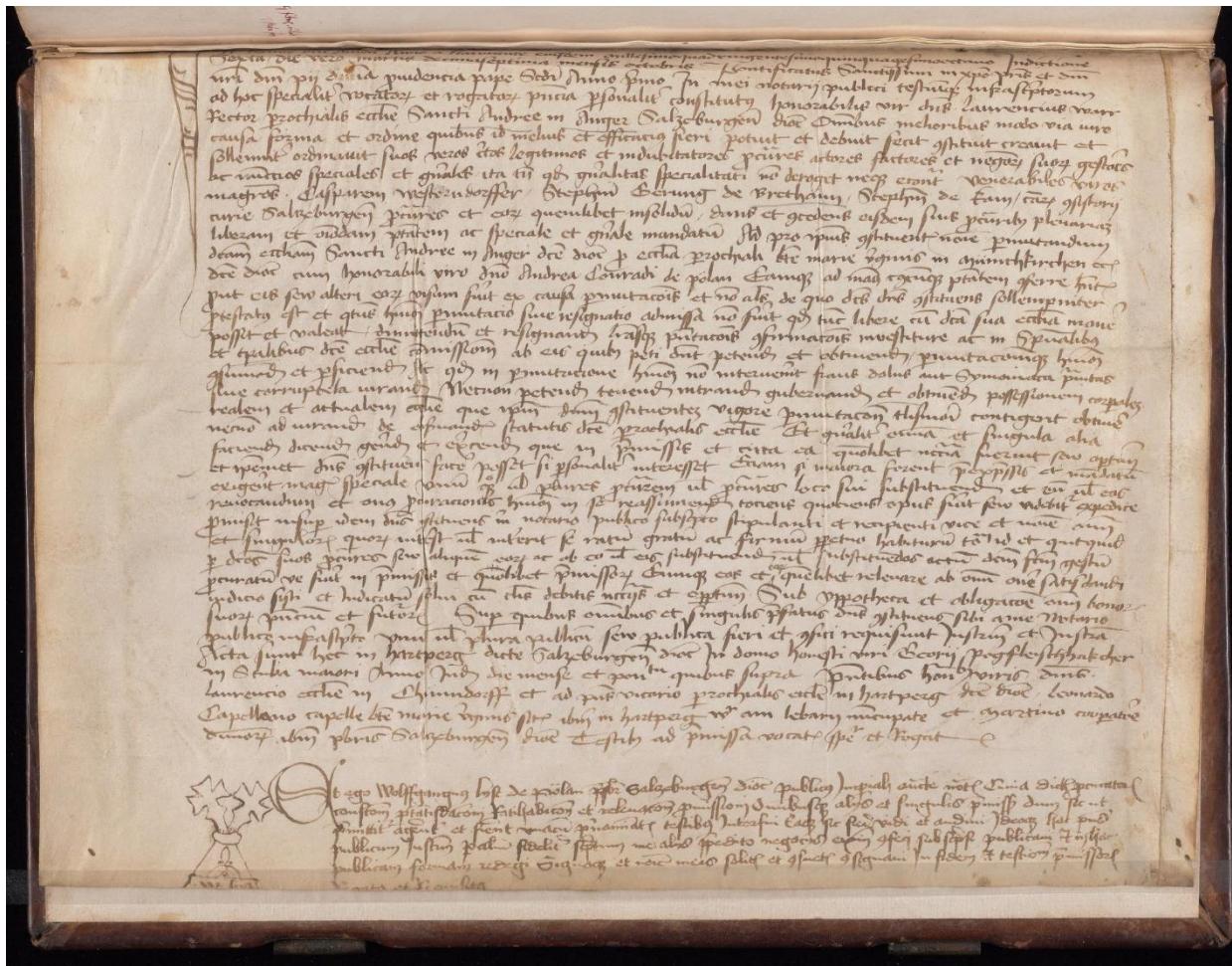
- How to say this?
- Vellum is a very nice kind of parchment.
- Veal is a very nice kind of meat.
- The meat, veal, comes from baby cows.
- The animal-skin writing surface, vellum, comes from ...
You guessed it
- Vellum comes from baby cows.
- Parchment comes from grown-up cows and sheep and goats.

Parchment is not Paper



- If you've made it this far, I might as well tell you that DNA analysis on some manuscripts in a Swiss Abbey showed that seal skin was also used (at least at that particular Abbey).
- We're talking about parchment reuse, so I guess we can say these monks and book-makers were conserving animals.
Hooray!

Genealogically Relevant Info



Back flyleaf or pastedown from a MS copy of Caesar's Gallic Wars

(28)

FH
TW

Genealogically Relevant Info



Date

Place

Occupation or Title

Name _____

In nomine domini Iesu Christi anno incarnationis eiusdem Mense Maie quodam genere anno sexagesimo quinto
 Roma die vero sancti Ieronimi pape sexto tunc vero testibus vel ipsius domine mandatis sum in episcopio
 papa et dominus dominus papa sexti anno sexagesimo quinto testibus missis ad hoc factis
 vocatus et rogatus iuris personaliter constitutus. Nam huius dñe Maximus Grabenitz testis personalis hinc sit
 et magnus papa electus salis dñe omnibus melioribus quibus melius et efficiens fieri potuit et debuit
 fieri constitutus creatus et dilectus ordinavit suos venos lituanos textos et indubitate piores actores factores
 negotiorum suorum gloriosos ac natus spadex et generales ita ut in quod qualitas specialitati non derogat nec econtra
 Veritas et congregatio virorum regum Sigismundum Lamberti Directorum Argem Henricum Regis Directorum
 locum sed Canicurie Curie Salzburgensis Protonotarii Andreae Gregorii Schenckenbormer iudicante Canicurie
 Notarios idem tamquam presen et quilibet eorum insidiata ita quod non sit melius conditio occupari nec deterior
 subsequens si quodcumque excepit alicet eorum propositum medietate valent et finire ad responsum pro eo et eius
 nomine memorata Etiam hinc Wahringus papa electus salis cu omnibus curibus et primariis suis in manus
 Etiam in episcopio et domini domini Sigismundi testis salis Ecclesie Aplice Sedis legatis aut alteri causibus ad
 hoc statim habentes. Nam ad petend et obtinendis libi per se operatum dnm nem facienda sibi Archbpom
 Salis in plebata Canicurie Wahringus reservauit annua pensionem iuxtam modum et scilicet Canicurie Curie Salis
 quoniam alium beneficium Ecclesiastici parvum fuerat assiduo illius dolus formidans suos fratres seu quis alia illata
 patens sine corruganda omni quoque vel plures pene suos fratres locis substitutus et adhuc eis reverendis
 et omnis prouocatores omni quoque vel plures pene suos fratres locis substitutus et adhuc eis reverendis
 omnia alia et singula faciens dicend gerend et prurand que in primis laicis fuerint et quilibet optumis
 Et que remet constitutis faciat se suscire posset et primis personaliter et postea si mandatis exigerent
 magis spale ex parte et expresso Promittit insuper deus dñe constitutus nunc Notario publico infra te
 rite et littere stampatae nec nomine omnium quoque inter se vel inter se et ratione
 atque firmis perpetuo habituone omne id est quicunque per deos suos fratres aut eorum alteros suos substitutos ab
 his seu eorum altero actu factu datum gestu pannatione fuit in primis et quilibet primis deo dubi probatur et obligatio
 omni bonorum suorum punitus et futuore. Supradictis omnibus et singulis stampatibus dñe constitutus peccat sibi a me
 Notario publico insciato vnde vel plura confia publico seu publico instrumento seu instrumento letas sunt hinc falso in
 domo habitaculo prouidiori Ecclesiastici male Oppidanum Casperum in dubia mori dominus eiusdem anno
 undevicesimus anno circa et ponte quibus supra dictibus ibidem Sagam Gregorio et Henrico viris regis
 Mattheo de Frankfordio in predictis locis ita dñe Petro pleno in Celsitach et Bernardo Graben
 Charrter de Salina Clericus cubiculari et dñe Salis hinc testibus ad primis votis hinc rogata



Daifungzum agnolonia
 S. ego Caspar Raffaele deus Aquilegiae dñe publicus Notarius. Quia promissatore procuratore constitutionis publicae
 omnibus et singulis aliis presentibus de se et premitis fierent et agerentur
 unius et promissoris testibus pno inter se. Eius omnia et singula sic fieri vidi et
 audi. Hodo pno publico instrumento per alii fiducie conscripsi me alios pre-
 ditis negotiis exinde confit publicari et in hanc publicatione formam hic
 subscrevendo redigi. Signo pno et nomine meis solitus et consuetus consignari
 Rogatus et requisitus in fidem et testimoniom omnium et singulare premissorum

Secundum dictum Antonii anno latinitate eiusdem **M**illecimquaginta et quinque annos reges sive monachos iudicem
Romam die vero **S**alomonis septima mensis terminata loca recesserunt vel quas Romae concesserunt in capi-
tione et dico indecum **p**ropter dñm puder **p**apae fidei **A**nnos tunc in mea natura plibet testibus infra id est ad hoc fiducie
vocatur et rogatur **C**oncordialiter constitutus **C**onstitutio eiusdem dñs **M**aximus **E**lector **P**rocurator **B**eauteate
Signaturis pape **E**berhardi **S**alz **D**ic **L**ombardis melioribus quibus melius et efficiens fieri potest et debet
ferit constitutus et sollemnitatem ordinatus suos vero letitos textos et indubitate paucos actores factores
negotiorum suorum gestores ac ministros speciales et generales ut in eis qualitas specialitatis non derogat nec econtra
venit et ergo reges viros **anglici** **S**igismundi **C**amerlingi **D**ecretorum **D**ictuum **anglici** **R**egni **D**ecreto
litteris **C**arissime **C**ivice **S**alzburgensis Prothonotarii **A**ndreae **H**artzebrechtini **E**xemplarium iamdicti **C**am-
Notarii usque tamquam presul et querilibet eorum insolidum ita quod non sit melius ratione occupari nec deterior
subsequitur si quodcumque alter ex eis propositum medie valueat et finire ad regnandum pro eo et eius
nostris memoratis **E**statu **S**ite **W**alhungen prope **E**berhardi cui omnibus suis fratribus et patrem suos in manibus
eum in capitulo eius et dico **d**omi **S**igismundi **C**ivis **S**alz Ecclesie electori apostolice sedis legati aut alterius cuiuscumque ad
hoc materia habentes Notario ad petendit et obtineret ubi per se operatum dñm nunc levendis illis **dictisq**
Salz in placita **E**cclia **S**ante **W**alhungen restauari animis pensionibus utriusque et stipulis **C**ivis **S**alz
quoniam aliud beneficium Ecclesiasticum pacifice fuerit asservare ad intercedere quod in quam dñi dñm constituents
spiritus regnacionis suae cessionem in quo non intercederent frater dolus somniorum spiritus seu quis alia illata
plano sine corrugatione. **V**nde quodcumque vel plures patrem suorum patres locis suis substituerent et eundem eos reuocarent
et omnes procuratores in se reassumant, totiens quoniam ipsi secundum alterius ipsius sunt expediri Et qualiter
omnia alia et singula facient, dicendo gerend, et prurando que in primis leuitate fuerint et quilibet optime
Et que memet constituents faceret se suscire posset si primis personaliter itesset etiam si mandatis exigerent
magistris scilicet predibus et expressis Promulgat insuper dictus dñs constituents nichil Notario propter **C**onstituta
rite et littere signatariae et nomine omnium quoniam intercessit seu interesse poterit quilibet infinitus se ratu gratia
atque nomine perpetuo habituatu omne id est quicunque per dictos suos patres aut eorum alterius suorum substitutoris ab
eis seu eorum alterius actus factus datum gestis patratus fuit in primis et quolibet primis **S**ub votis et obligatio
omni bonorum suorum patrum et futurorum. **S**up quibus omnibus et singulis supradictis dñis constituents parant ubi a me
Notario publico insciatis cum vel phoca confia publio seu publico instrumento seu misterio leta sunt hoc **scriptum** in
domo habituatu proximiori **C**eciliam **M**aler **O**rdinari **S**criptori in stuba moxi domini eiusdem **A**anno
inducti die mensis **A**prilis et ponte quibus Syria libibus ibidem Sagam Gregio et Henrico in **anglia**
Mathew de **F**rankenforde in medium licet **t**extu dñs **P**etro **P**ellio in **C**iechbach et **B**ernardo **G**oldrem
Matter de **S**alina Clericus Lubicens et dicto **S**alz dice testibus ad primis votis inde rogatio



Zaiffungzur agnolina

Sic ego Gaspar Raffinger deus Aquilegiorum dico publicis lata imperiali iusti-
Notarius. Quia promissore procuratore consuetudinum publicorum pmissione
omnibusq; & singulis aliis personis de se de premitte fecerint et agerantur
annuit promissis testibus proprie inter se. Tali omnia & singula sic fieri vidi et
audiui. Hodo pro publico instrumento per alium fideliter conceptu me aliis me-
dico negotiis exinde consed publicari et in hunc publicum formam hic me
subscrivendo redigi. Signoq; & nomine meis scitis et consuetus consignari
Doyatus et recognoscens in fidem et testimoniun et singulare premissore

In nomine domini amen. Anno incarnationis eiusdem millesimi
 et nonagesimi sexagesimi annorum. Datum die vero salutis dominicae septembris
 prius et die madidi p. diuinam iuridicem papae sedis anno terciorum
 vocavit et rogatus personaliter constitutus. Et hoc iuramento
 Salzburgis prope Eberstein salutis die omnibus meliorib.
 fuit constitutus etiam et solemniter ordinavit suos venos
 negotiorumque gestores ac iuratos fratres et generales ita
 veniles et Gregorianos viros angelum Sigismundum Lamberti gen.
 licen. ad causas curie Salzburgensis procuratorum. An
 Notarios vel seniores quicunque preser. et quamlibet eorum insidiu. ita
 subsequens si quodcumque excepit alteri evendit, proficiat me
 no. memorata etiam sita Salzburgis prope Eberstein
 anno in xpo p. et dñm dñm Sigismundi etate salutis Ecclesie de
 hoc statim habentes, nec ad petendit et obtinendit alibi p.
 Salutis in p. libato etiam Sante Walburgis reservari. cum
 quicunque aliud beneficium etiam tunc parifice fuerit assentus
 quod resignator sive cessionario in eo non intraveretur fra
 patio sive corruptela. Unum quoque vel plures paucem seu per
 et omis procuracionis huius in se reassumend. taciens qu

Milesimo quinquaginta nonagesimo sexagesimo anno. Inde
 maris hora vespere vel quasi nocte sanctissimum in xpo
 anno tertio triplex notarium plibet testium infra id hot. p. ad
 silvam dñs Maximus Grabenitz. Etiam procuratio fratre sita
 velociibus quibus melius et efficiens fieri potuit et debuit
 et venos litteras certos et indubitatos paucos actores factores
 tales ita tri qd. qualites specialitati non deringeret nec econtra
 regis directorem doctorem angelum Henricum Regniz. directorem
 eti. Andreae Hartpreger. Schrem Rosenthaler ianuete Cam
 didi. ita qd. non sit meliore condicio occupari nec deterior
 qui mediane valeat et finire ad resigmand. pro eo et eius
 Eberstein cui omnibus fratribus et proximis suis in manibus
 Ecclesie decim. apostoli sedis legati aut alteri coniunctus ad
 alibi per legem dñm non levendiss. Andropin
 in aliis pensioni uixit inde et filius Caspar curie curie Salz
 bentz ad uicand. quicquid in aliis dñd dñm constituentis
 erit frater delius sonorata pietatis seu quis alia illitatu
 seu minima loculi substituend. et quicquid esse reuocand

M nomine domini domini anno lacavitate eiusdem Mense
Roma die vero salis dominis septima mensis tamquam
prius et domini mardi domini p[ro]p[ter]a diuina prudens papae sedi anno tere
torum et rogatur p[ro]p[ter]a p[ro]mulgationem constitutus consilium
S Walpurgis prope Eberstein salis die omnibus miliebus
finit constituit creavit et solemniter ordinavit suos venos
negotioresque suos gestores ac numerus sp[irit]uales et generales ita
veniles et egregios viros angelum Sigismundum Lamberti
lucem bidicatur curie Salzburgensis Prothonotarium anni
Notariis vellet tamq[ue] presen[ti] et quilibet eore insolidu[m] ita
subsequens si qd[em] non experiret alter ex eisq[ue] prosequi in
no[n] memorata l[et]ta S[an]cte Walpurgis prope Eberstein
anno in xpo prius et domini d[omi]ni Sigismundi S[an]cte Salis Ecclesie
horum patrem habentes necno ad pretendit et obtinendit sibi
Salis nisi pilibatu l[et]ta S[an]cte Walpurgis reservauit anni
quoniam alius beneficium Etiam huius pacifice fuerit offensio
ep[iscop]i in resignatione sive cessione huius non intruivenerit fro
natum sine corruptela huius quoq[ue] vel plures p[ar]uum seu per
et omnis procuracionis huius in se reassidens, tuncens qu

Nihil est quoque dignus sine spargere in eodem iudicem
 natus. Quia vestrum vel quasi donum dominissimum in populo
 non tenet in mei Naturam plumbi testiumq; infatuorum ad hoc sed
 si uox dñe **Maximus Baebenit**, **lucis procurialis** bne sacre
 celioribus quibus melius et efficacius fieri potuit et debuit
 et venes letimos certos et indubitatos paucis actores factores
 ales ut in qd; qualitatibus specialitati non derogat nec econtra
 regis decretis derogatur. **Argum Hamicu Regni**, **de rectori**
 cuius **Andrea Hartpreger** schem **Rosenkappner** iamdicti Cam
 didu ita qd; non sit meliore condicio occupari nec deterior
 qui mediane valeat et finire ad resignandis pro eo et eius
 heretum cu omnibus suis futuris et presentiis suis immobibus
 Ecclesie dicim aplice sedis legati aut ulterius cuiuslibet ad
 nisiibi per se praeeditum dum ministrum **Archipin**
 in annis pensionis iuxta modum et stylum Camarue **Cucie Salz**
 Recens illi uicordi quoq; in aiem dicti dum constituentis
 erit frater dolus formonata punitas seu quis alia illittera
 seu minima leonis substituenda et inducere eam reuocare

Date	Place	Occupation or Title	Name

Do we see more like that?



- Yes
- Enough to make it worth our while to do a big search.

ML Info

- How we find it?
 - Transfer Learning from a Residual Neural Network
 - Dataset of 622 images, 10% showing manuscript reuse, 95:5 split
 - 30 epochs and 96.77% accuracy
- [Talk to Keith, the man with a nice GPU to work with, about the current numbers.]
- [Really, have Keith present this point, since the model is still being updated with more data]

Foundational Models

- Some things almost always work well.
 - Let's keep using them.
- Some things have been done well, and very thoroughly, with lots of data.
 - We can use these models as a starting point and fine-tune them to our needs.
 - The fine tuning is known as Transfer Learning.
 - This allows people and/or institutions who don't have the same amount of data as Google or Amazon to participate in moving Machine Learning/Artificial Intelligence forward.
 - It's been especially important with Computer Vision, lately.

ML Info

- What did we use?
 - ResNet-50
 - Trained on ImageNet (huge)
 - Our model changed weights for that model, so it would work for ours
 - (Okay, it's more complex than that, but it gives the right idea)
- Info about ResNets, residual functions, and deep neural nets, such as ResNet-50 with 50 layers, in the backup slides (hopefully by workshop time)

Other Use Cases

BONUS. Other relevant use cases for such a procedure

- * Find predictably at-risk documents – iron gall ink corrosion
 - words that eat themselves
 - causes holes in documents and fragile, shatter-prone pages
- * Find stitching – of interest to Manuscript Studies people
 - How books were made
 - From parchment makers and from monastic embroiderers
- * Find manicules – *Nota Bene* | (U+261{A-F}) | 
 - Drawings (later, typeset) of a hand with pointing index finger
 - This allows us to see what readers and writers considered most important
- * Find palimpsests
 - Bring this up, or wait to see if there's a question about it?

These other use cases are described, illustrated, and discussed in the backup slides. If you have any interest, please have a look, and please feel free to [contact us](#).

BACKUP SLIDES

{ 40 }



To Contact Us

- This info is for Dave. Dave can get a hold of Keith, if desired.
- The best way (and easiest to put online without exposing email to spam) is either through
 - sending me a LinkedIn message (much preferred)
 - <https://linkedin.com/in/thedavidwblack>
 - raising an issue on the repo for this project on my GitHub account.
 - <https://github.com/bballdave025>
 - This project's repo is named `manuscript-waste-reuse-finder`.
 - The complexity of this method makes it a second choice for me, but you're welcome to use it if you're not on LinkedIn or if you vastly prefer not to use it.
- After contacting me via one of these means, I can send you more direct contact info.
- **If we're at the workshop, please come over for a chat. I'll be happy to give you more direct contact info.**

Check Current Version

- The most current version of this **presentation** (the one now being given at FHTW 2024) can be found at Dave's Google Drive – shortlink bit.ly/dk_rmf_pres
That's PDF.
- You can get the same place by scanning the giant QR code.
- For updates after the workshop:
github.com/bballdave025/manuscript-waste-reuse-finder/



Check Current Version

- The most current version of the **paper** by Dave and Keith (the one accompanying the presentation now being given at FHTW 2024) can be found at Dave's Google Drive – shortlink below. You will get a PDF.
- You can get the same place by scanning the giant QR code.
- bit.ly/dk_rmf_paper ; That's PDF.
- For updates after the workshop:
github.com/bballdave025/manuscript-waste-reuse-finder/



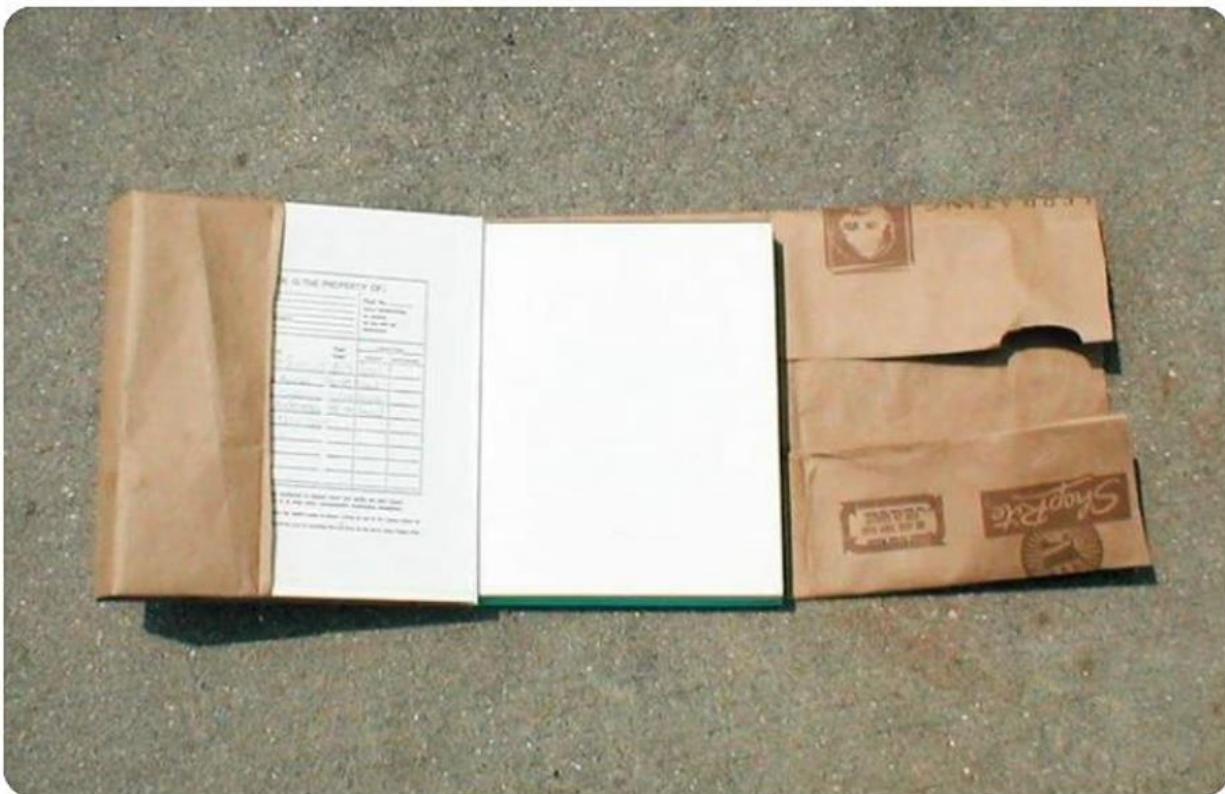
Brown Paper Bag Book Covers



r/nostalgia • 6 yr. ago
ChBrewdog

...

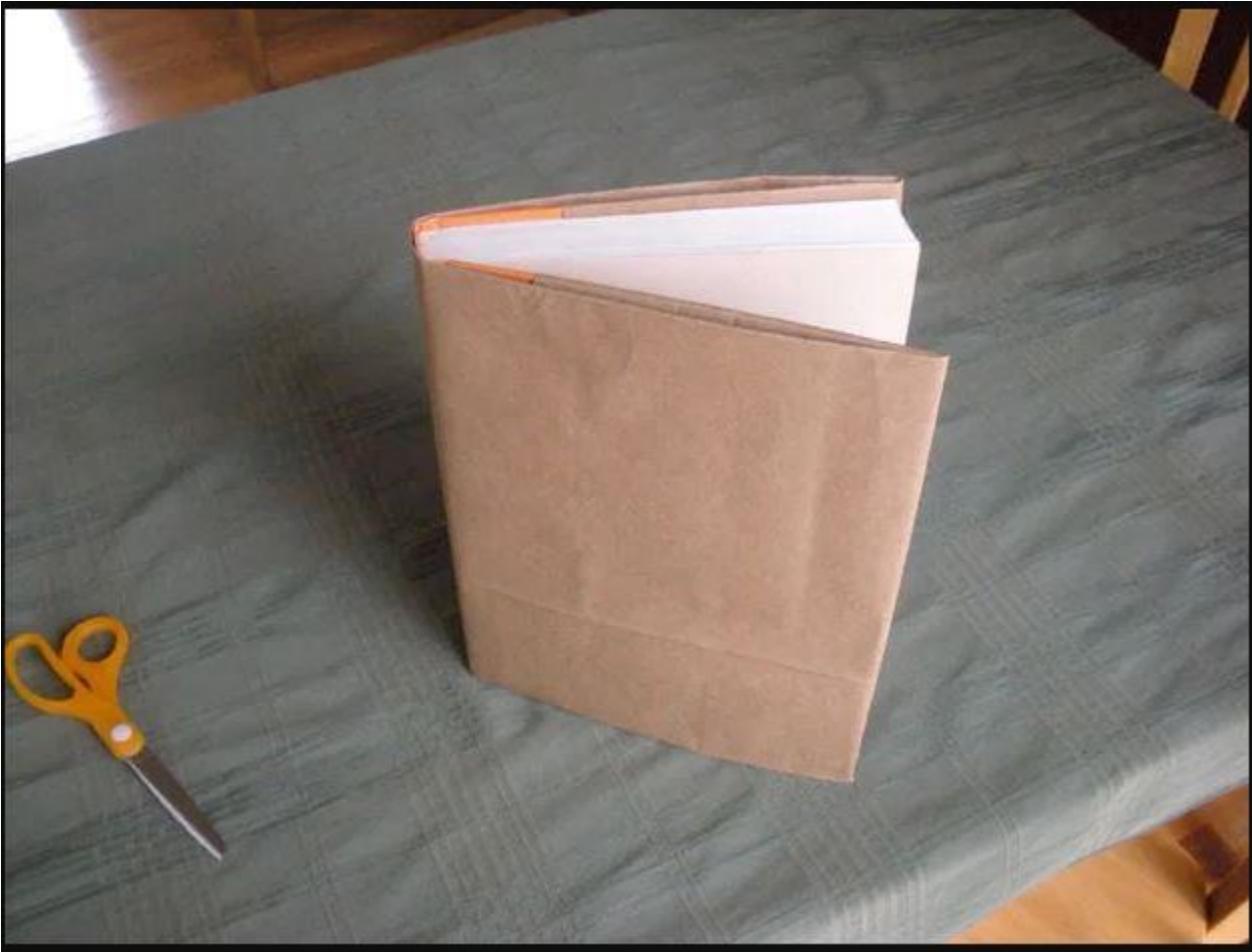
Who remembers covering your text books with brown paper covers and then doodling on them?



(44)

FH
TW

Brown Paper Bag Book Covers



Actual Example: Not Quite Brown Paper Bag Book Covers

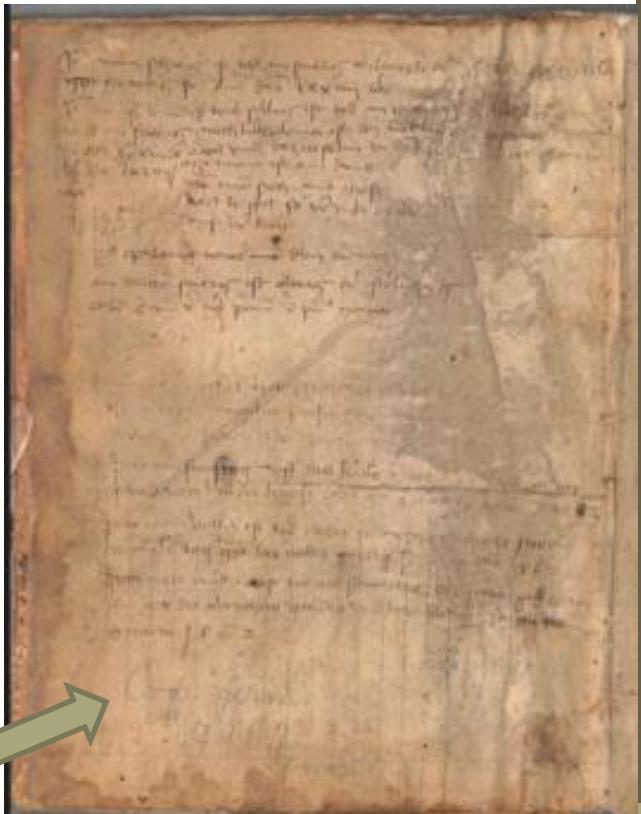
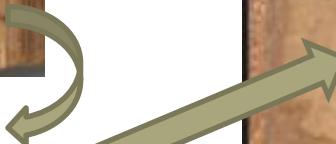


Paste-down

1. Put glue on this right-hand page



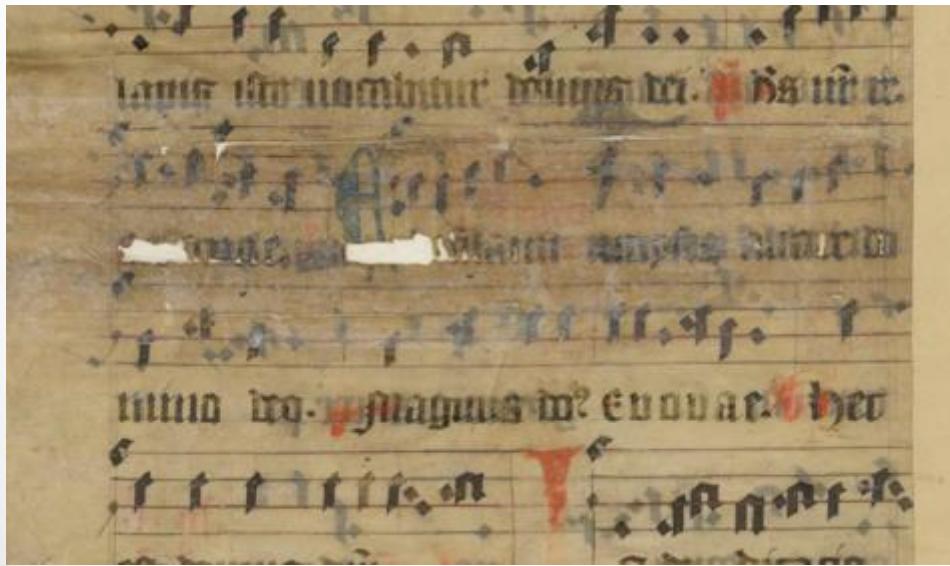
2. Turn the page



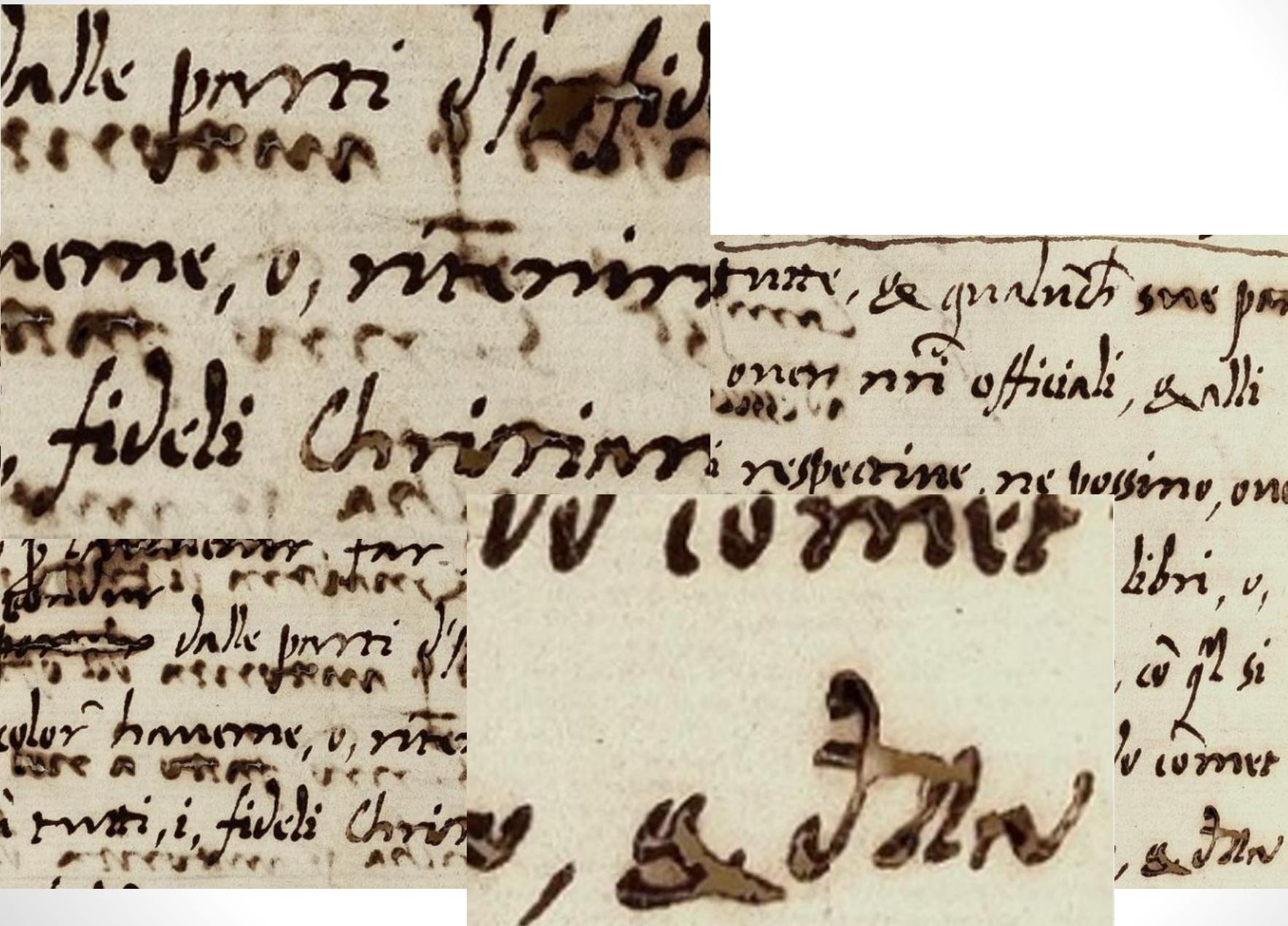
3. Get this for your new left-hand side

Use Case 1 – Ink Corrosion

- Iron Gall Ink



Use Case 1 – Ink Corrosion

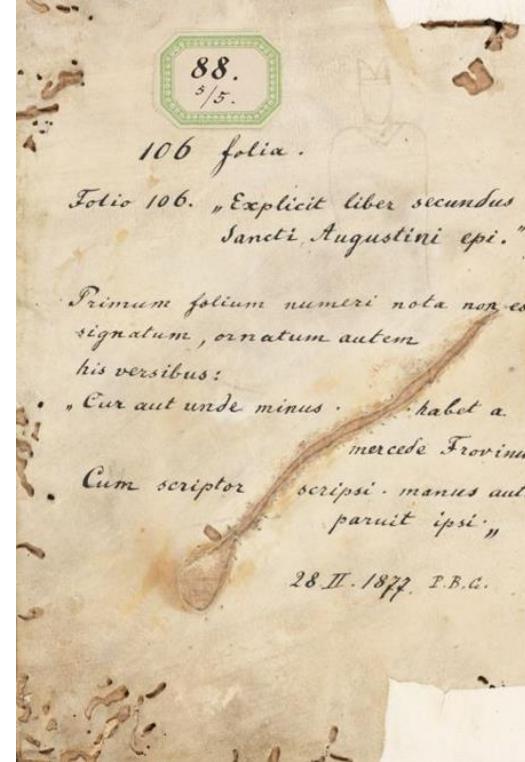


Use Case 1 – Ink Corrosion

- Four stages of degradation, see [iron gall ink website](#) (also see the [prognosis](#) tab) or [British Library Conservation blog](#).
- We could make sure the model worked on cell-phone photos. This could provide motivation for archives to allow digitization of their holdings.
- The current dataset only has stage 4 marked – mostly because I'm not an expert in recognizing the earlier stages, but I can see a hole in the page that follows the general outline of the writing.
- Further data could be gathered, *with* experts, to identify stage 2 and 3 degradation.
- Don't use compulsory means, but motivation likely follows hearing, “Your pages will shatter within 50 years. We're willing to work with experts in handling and digitizing the documents, so you can keep your information.”

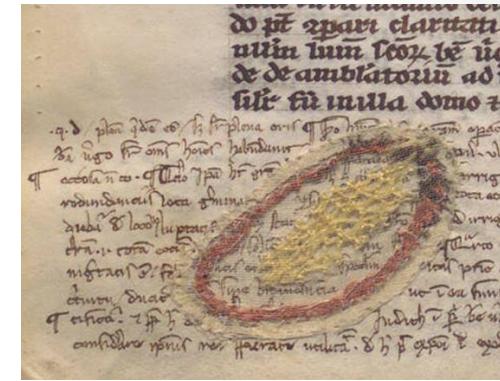
Use Case 2 – Stitching

- Part of the parchment-making process



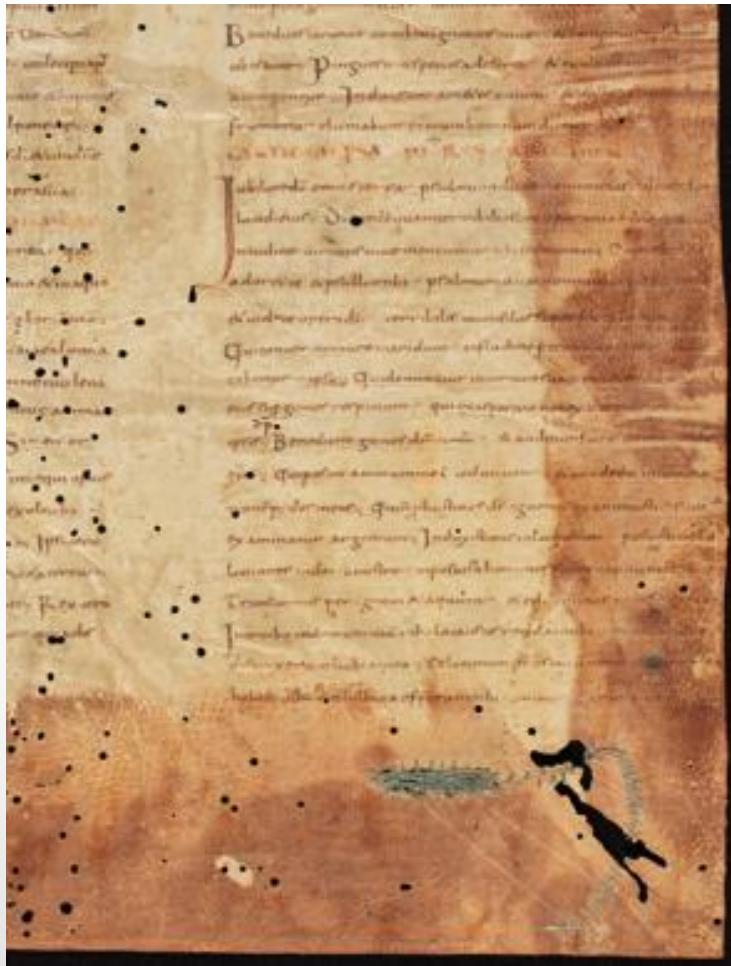
Use Case 2 – Stitching

- Research by
- Embroidery, likely by monks or nuns



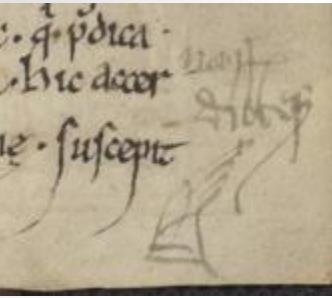
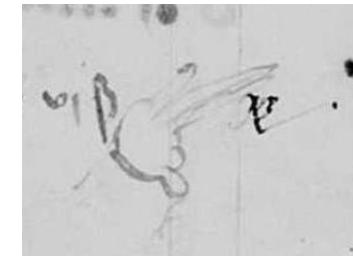
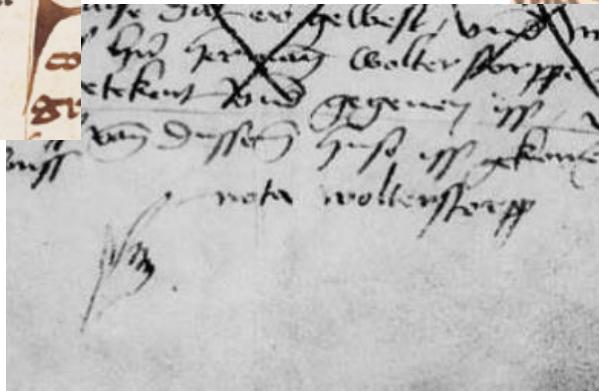
Reuse Case 2 – Stitching

- Who stitched these? I don't know.



Use Case 3 – Manicules

- Find out what readers, annotators, and writers considered important.
- I've found these in 3 FamilySearch films. Two of them were very genealogical.

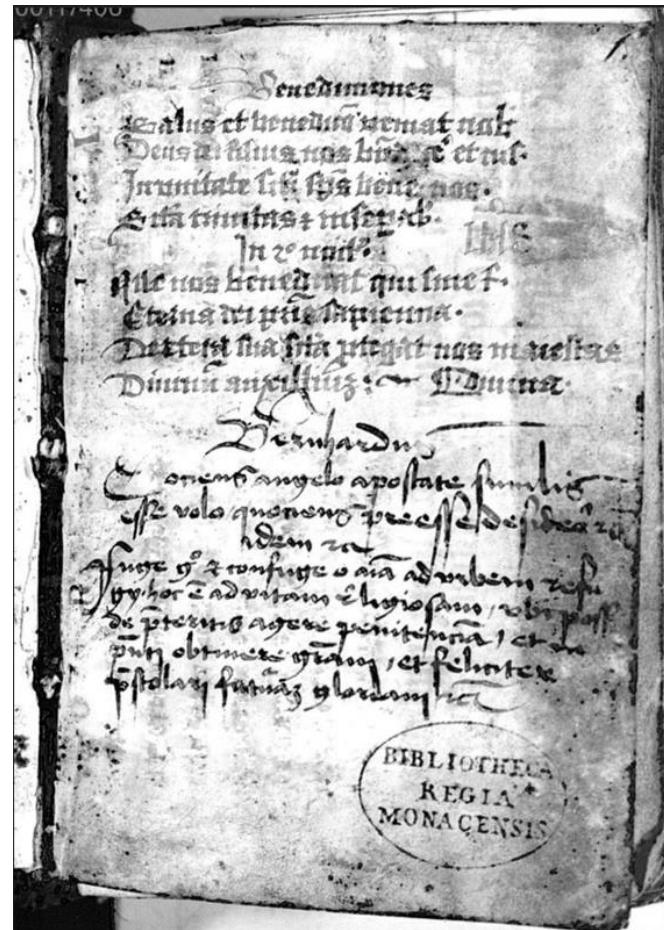
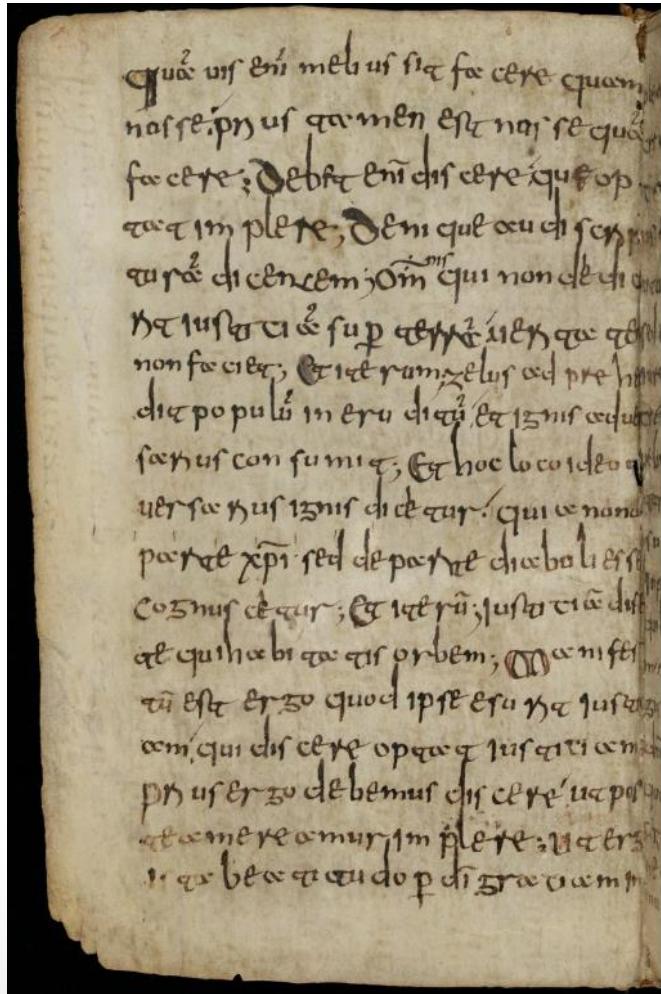


alium p
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on autem
quem dor
enim
nus opti
alam
ne decr
mitatis

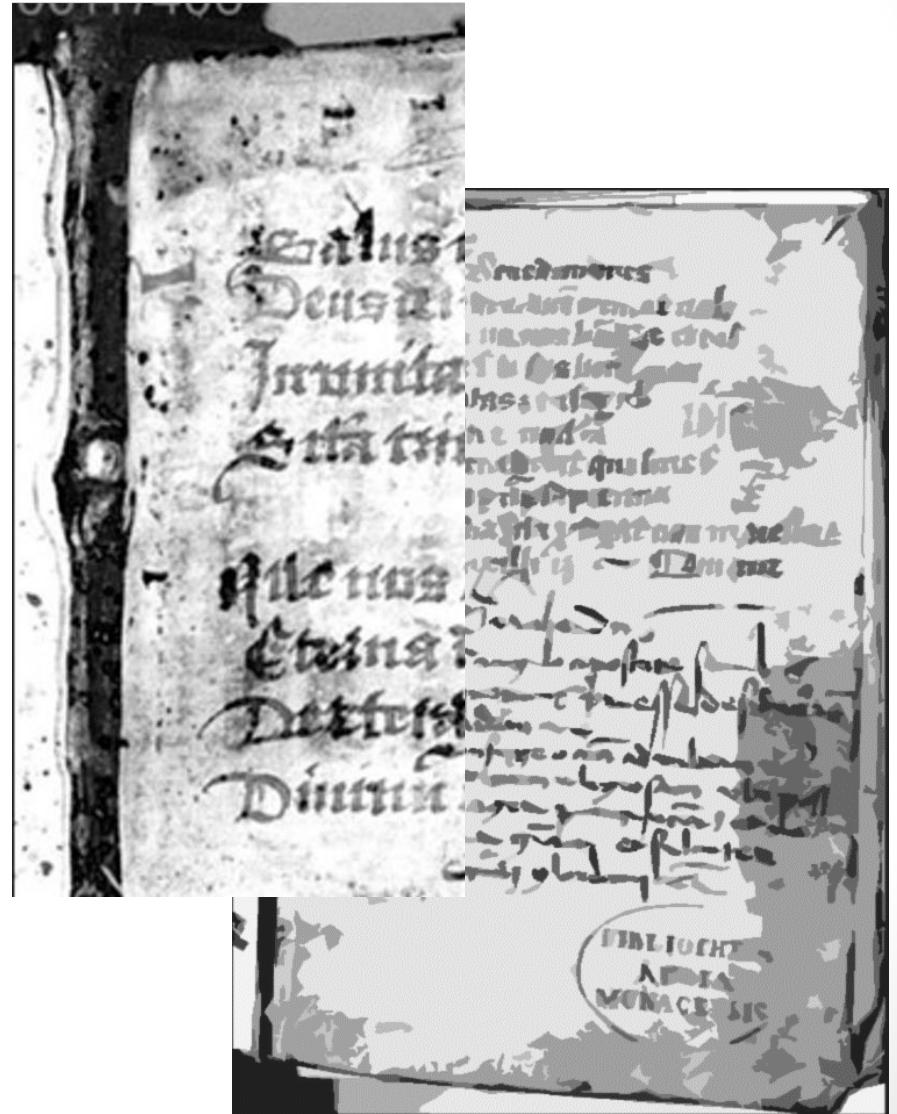
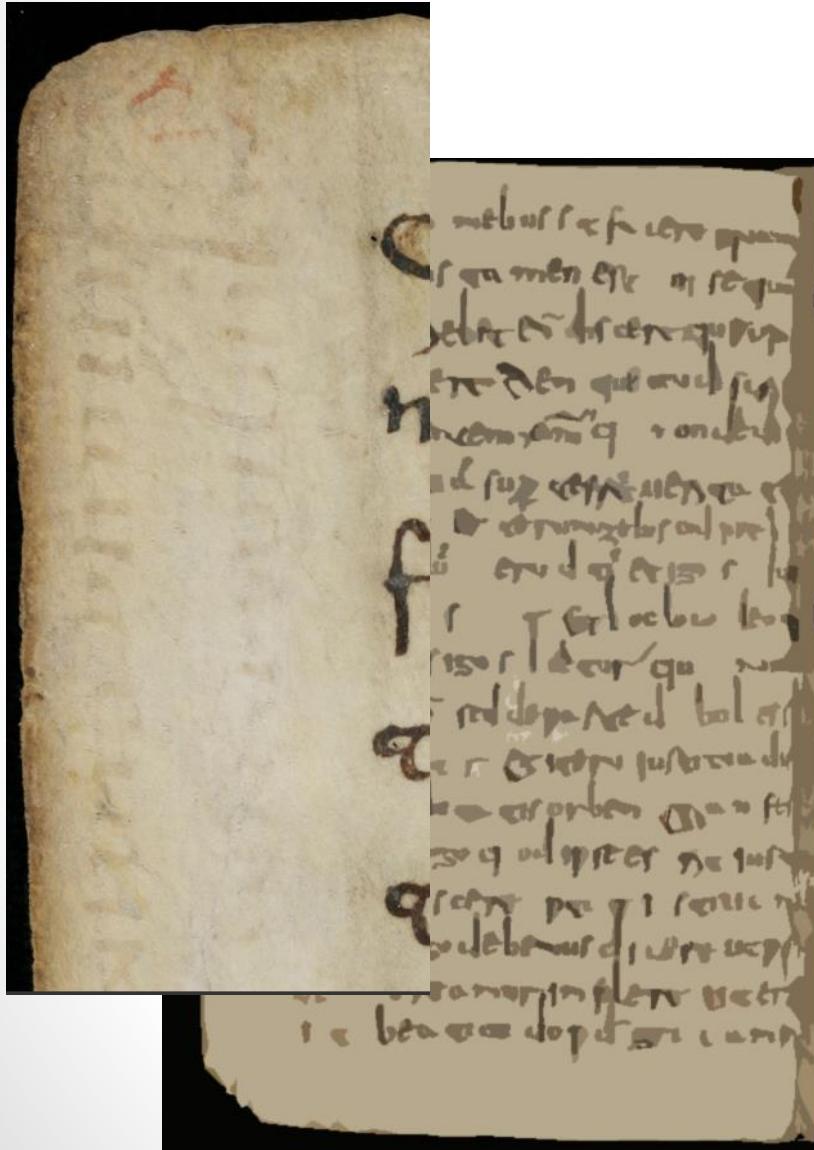
Use Case 4 – Palimpsests

- From the MOOCs I've taken, it seems these have been “studied out”.
- Also, there's likely not much genealogical data.
- Still, the fact that no one has searched through large genealogical databases makes the search an intriguing one.
- Our ~50k image dataset has examples of palimpsests.

Use Case 4 – Palimpsests



Use Case 4 – Palimpsests



Use Case 5 – You Tell Me

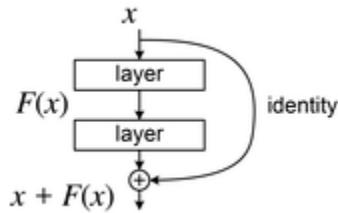
- Please, share your ideas with us. We're sure you have creative and important things for which we can search, especially that relating to genealogy.

ResNets and Residual Functions

- A way to allow really deep networks
 - ~~Avoid exploding and vanishing gradient issues~~
 - Well, actually it's to ameliorate degradation, but we're fixing a problem that comes from having many layers
- Allows the model to learn from its mistakes
- Residual functions replace layers
- The deviations of the dependent variable observations from the fitted function are the *residuals*
 - $\text{fitted_value} - \text{actual_value}$
- A residual function is somewhat different, but has the same idea of something akin to an error.

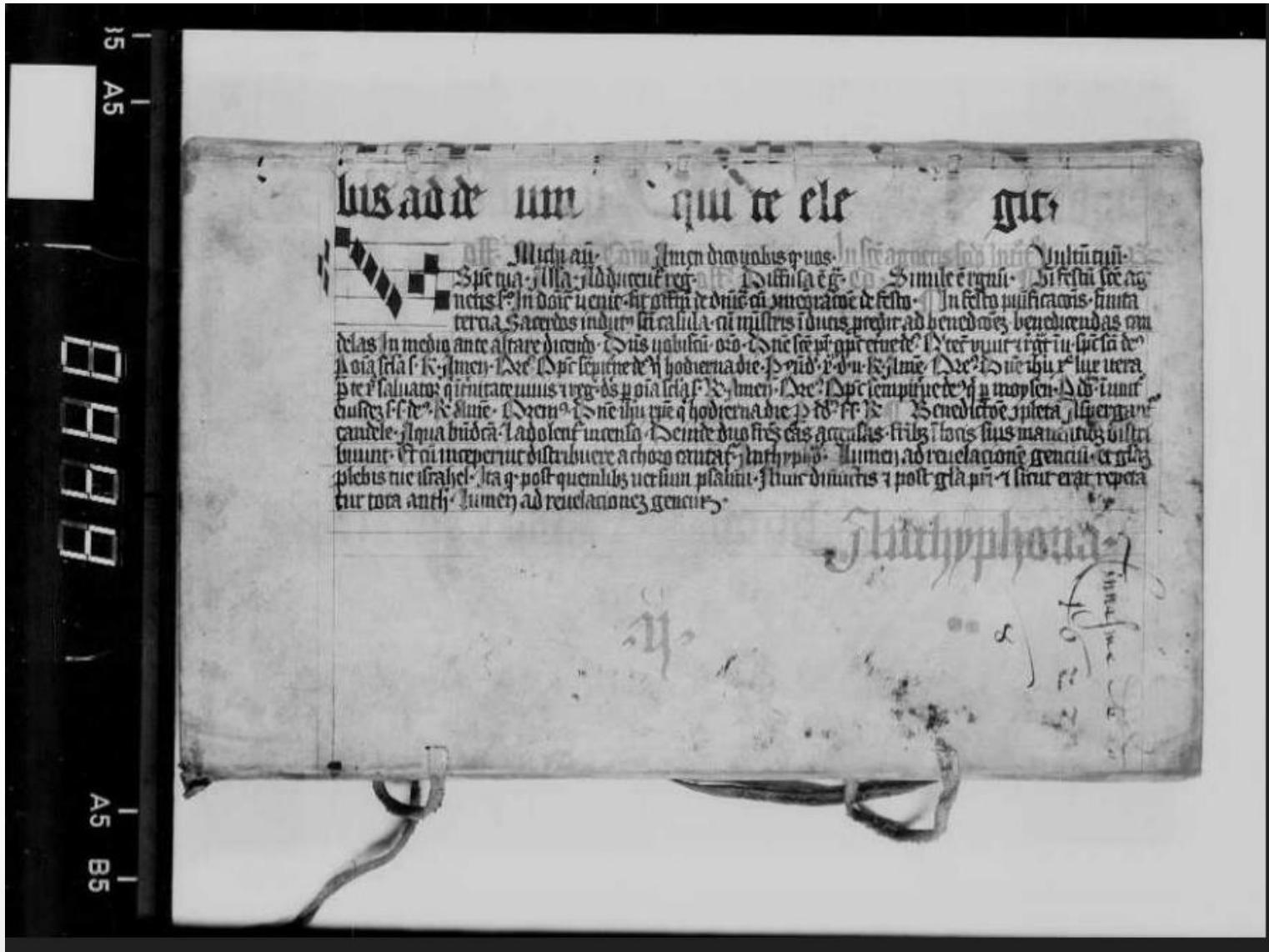
ResNets and Residual Functions

- Residual functions replace layers
 - They're sometimes called skip connections

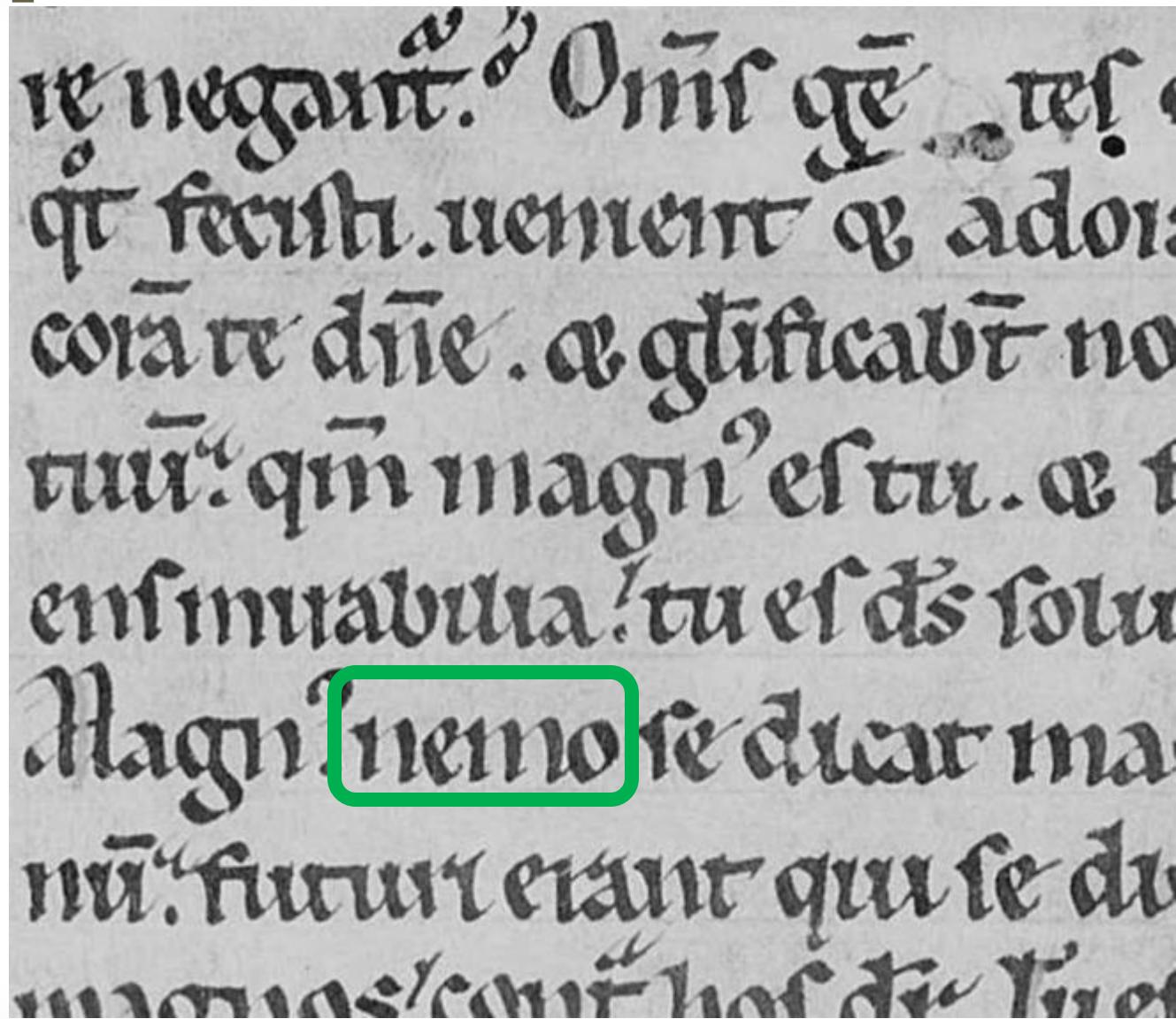


- x is input
- $H(x)$ is the expected output
- $F(x)$ is the mapping learned by the skipped layers
- $H(x) = F(x) + x = F(x) + I(x)$ where $I(x)$ is the identity function/mapping
- So we define the (experimental) $H(x) - x$ as the residual
- The network (the two layers) try to learn the residual, just the residual, rather than acting as a simple part of the complete network
- This makes optimization easier (possible).

Surprises, Wows, Favorites



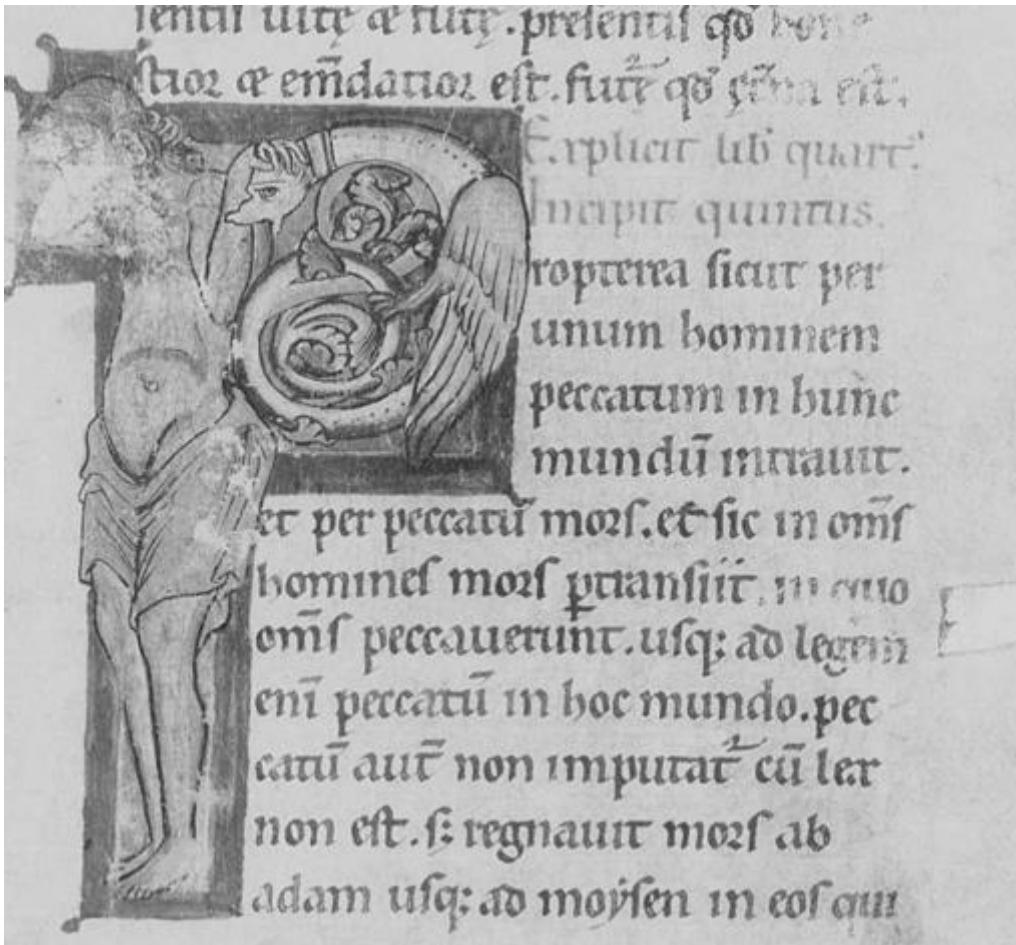
Surprises, Wows, Favorites



ie negant. Om̄is ḡe... teſ...
q̄t fecisti. uenient q̄ adorat
corā te dūne. & glificab̄t no
tuū. qm̄ magi' eſ tu. & t
enſimutabilia. tu eſ d̄s ſolu
Magni. nemo ſe dicat ma
nu. futuri etant qui ſe du
mores/conī hof d̄s. Tio

I didn't find anyone. Well, I found nobody. Well, I found *nemo*. In Latin, *nemo* means nobody.

Surprises, Wows, Favorites

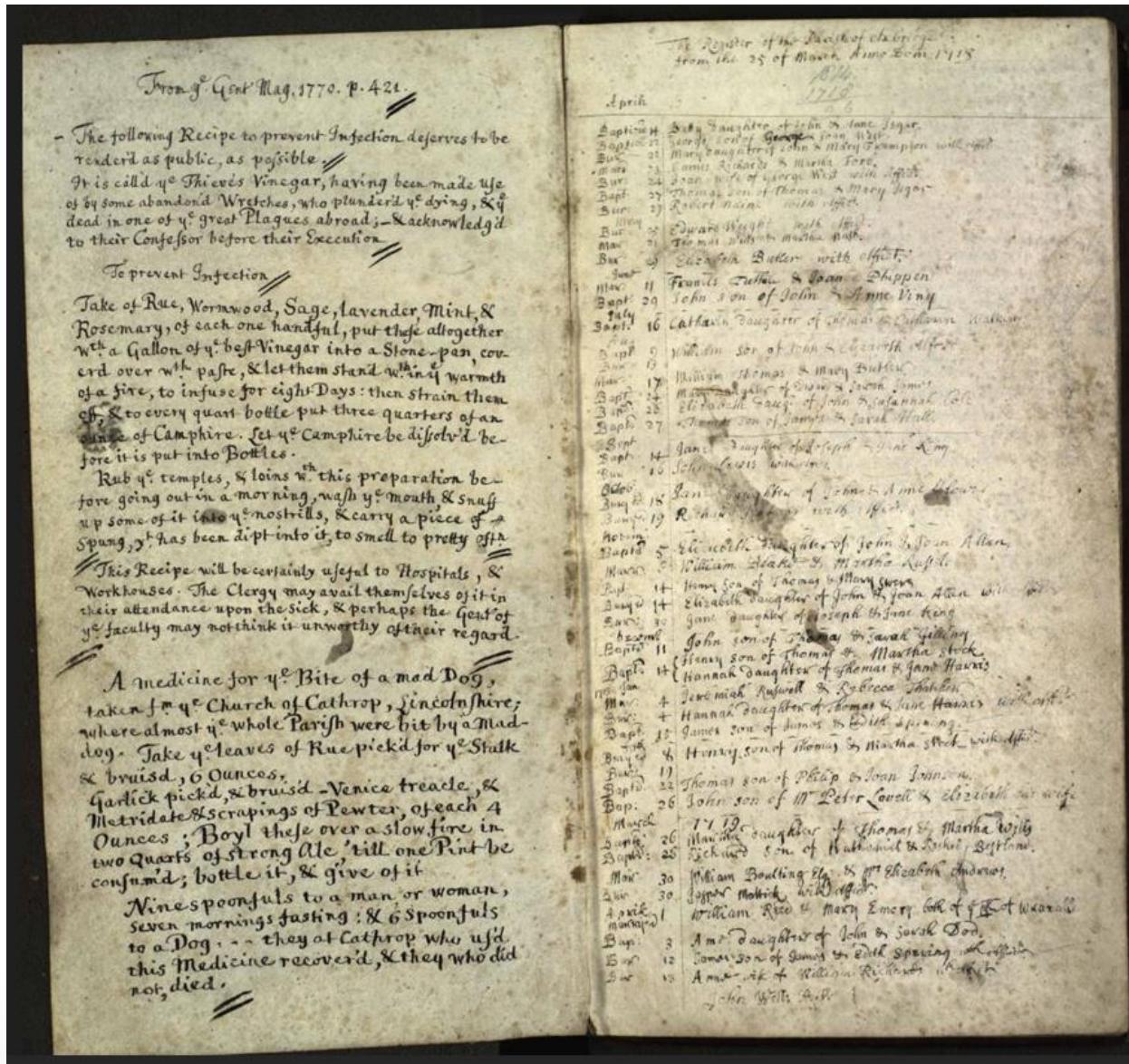


Mark 5:12 on a front cover

Surprises, Wows, Favorites



Surprises, Wows, Favorites



Surprises, Wows, Favorites

Thomas Water the sonne of John Water was buried the third day of March
Edward Water son of Wilson Water mylles was buried the 6th day of April 1635.
Mr Thomas Wmrold Allerda was buried the fourth day of April 1635.
Hannah Goldsmith daughter of George Goldsmith was buried the 20th day of May 1635.
Elizabeth Blythe the daughter of John Blythe was buried the 28th of May 1635.
Mr Katherine Allm the wife of John Allm was buried in the County of
Wales now buried the 29th day of May 1635.
Edward Water the sonne of John Water was buried the tenth day of June 1635.
Jane Watlington the wife of Willia Watlington was buried the 12th of June 1635.
Margaret Pwall daughter of Jasper Pwall was buried the 18th day of June 1635.
Margery Player the wife of Edward Player was buried the 18th day of June 1635.
Robert Butcher sonne of Robert Butcher was buried the 24th day of June 1635.
John Moore was buried the 24th day of June 1635.
John the tennour by some of Henry Clemons was buried the 25th of July 1635.
William Sime was buried the 3rd day of July 1635.
Edward Watlington was buried before the time of July 1635.
Edward Long sonne of Edward Long was buried the 27th day of July 1635.
John Grifffen the sonne of Wm. Grifffen was buried the 15th day of July 1635.
Elizabeth Grifffen daughter of Wm. Grifffen was buried the 15th day of July 1635.
Miles Purgrave preboste of Hugh Purgrave was buried the 15th of July 1635.
Watson Waller the sonne of Watton Waller was buried the 19th of July 1635.
Margaret Hartt the wife of D. Hartt was buried the 22nd day of July 1635.
Sister Lucy the sonne of S. Water mylles was buried the 27th of July 1635.
Edward Water sonne of John Water was buried the 27th day of August 1635.
Mrs. Belwith daughter of Queen Belwith was buried the 24th of August 1635.
George Egerton sonne of Geo. Egerton was buried the 28th of August 1635.
Edward Bryan sonne of Cartwright Bryan was buried the 26th day of November 1635.
Jane Harling daughter of Willia Parling was buried the 29th of December 1635.
Chapman Hobbis sonne of John Hobbis was buried the 2nd day of January 1636.
Mrs. Amy Hull was buried the 24th day of January 1636.
Anne Hobbe daughter of Walter Hobbe from wachesters 1636. day of February 1636.
Robert Hobbe sonne of Robert Hobbe was buried the 25th of March 1636.
Nicasian Graynes the wife of Thomas Graynes was buried the 12th day of April 1636.
Robert Ward sonne of Robert Ward was buried the 1st day of May 1636.
Margaret Shurie daughter of Anthony Player was buried the 16th day of May 1636.
John Alcock a stranger was buried the 20th day of May 1636.
John Stubbis sonne was buried the 26th day of May 1636.
James Wallis was buried the 5th day of June 1636.
Edward Grace a taymer was buried the 12th day of June 1636.

John Blakett was buried his last day of August 1636
Mary Collier daughter of Robert Collier was buried Oct. 12. of November
Hester Long sonne of Hester Long was buried the 24th day of December 1636
Peter Chamber's sonne buried his ellementary day of December 1636
Anne Collier widow was buried the 13th day of December 1636
Agnes Gold some of Margaret Gold was buried the 28th day of November 1636
Dorcas Greene daughter of Thomas Greene was buried Dec. 14th day of December 1636
Robert Gooe sonne of Robert Gooe was buried the 20th day of December 1636
Abraham Robertson buried the 26th day of January 1636
John Lyle was buried the first day of February 1636
Joseph Collier widow was buried the 15th day of March 1636
George Collier sonne of George Collier was buried Oct. 24th of March 1636
James Parker daughter of Thomas Parker was buried Apr. 27th day of May 1637
Elizabeth Morley daughter of Robert Morley was buried the 29th day of May 1637
Dorothy Pytter widow was buried Apr. 5th day of April 1637
John Stiles was buried the 20th day of April 1637
Elizabeth Davis or the wife of John in Southwark as Sonnes was
buried the 20th day of May 1637
Miles Toller widower was buried the 30th day of May 1637
John Lee or Leeke sonne of Leeke was buried the 25th day of June 1637
William Mather sonne of Anthony Mather was buried the 25th day of August 1637
William Ward sonne of Thomas Ward was buried the 12th day of August 1637
Wm Martin sonne of Wm Martin was buried the 25th day of September 1637
John Jeffries of the 25th of Paulton was buried the 15th day of August 1637
Anne Goldsmith daughter of John Goldsmith was buried April 16th day of April 1637

Buried by
2 buried Sept 18
in this ward buried
Henry Clowden m
of Ambreye Lang
of the first of October in
the year of our Lord Christ
one thousand six hundred and
fifty four Margaret
daughter of Robert
Ward son of Ward
of Chippingham



How I feel when I don't find **The Rest of the Story**

(67)

FH
TW