Materiality in Digital Editing - State of the Art

A Digital Medievalist Panel

IMC 2019, 1.7.2019
The Digital Medievalist Project begins in 2001/2002 to provide an internet-based community and resource centre for medievalists working with digital media.

Based on the Community of Practice learning model, DM provides a forum through which medievalists can improve their skills in research employing digital technology.
DM Project: 2002

Peter Baker, University of Virginia
Martin Foys, Hood College
Murray McGillivray, University of Calgary
Daniel Paul O'Donnell, University of Lethbridge
Roberto Rosselli Del Turco, Universita di Torino
Elizabeth Solopova, Bodleian Library

Marinus Swanepoel, University of Lethbridge (formerly Technikon, Pretoria)
Ian H. Witten, University of Waikato
Services

DM-1 mailing list
https://listserv.uleth.ca/mailman/listinfo/dm-1

(Wiki)/Website/Blog/News server
http://www.digitalmedievalist.org

The Digital Medievalist Journal
https://journal.digitalmedievalist.org/
DM on Facebook

http://facebook.com/groups/49320313760/

DM on Twitter

@digitalmedieval

https://twitter.com/digitalmedieval
Some stats

1350 subscribers to DM-1

2243 members on Facebook

6118 followers on Twitter
Some stats
Administration

Executive Board

2-year terms (up to 3 terms) – 8/9 members

Roman Bleier (2017-2019)
Els De Paermentier (2015-2019)
Lisa Fagin Davis (2017-2019)
Greta Franzini (2015-2019)
Alberto Campagnolo (2014-2020)
Franz Fischer (2014-2020)
Mike Kestemont (2016-2020)
Lynn Ransom (2016-2020)
Georg Vogeler (2014-2020)
Administration

(Post-)Graduate Student SubCommittee

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Aylin Malcolm
Daniela Schulz
Nathan Daniels
Tessa Gengnagel
Community of Practice
New Philology
“Traditional” philology (Lachmann / Maas)

- focus on author
- Urtext / archetype
- genealogical method (stemmata)
- transmission = story of decline
- normalization / standardization
- “text that never was”
- neglecting documents as such

“New” philology (~1990s)

- focus on traditions & versions
- historical context / reception
- “sociology of texts” (McKenzie)
- Text = laced network of linguistic & bibliographic codes (McGann)
- new evaluation of relationship between “text” & its manifestation(s)
each version of a text handed down to us is understood as a historical state which must be documented in an edition. It is not the editor’s goal to create the ‘best’ text from all versions handed down to us, but to document the text as the historical development of its versions

(Plachta 2002, 147 [emphasis added])

Literary works invariably exist in more than one version, either in early manuscript forms, subsequent print editions, or even adaptations in other media with or without the author’s consent. The process of authorial, editorial, and cultural revision that create these versions are inescapable elements of the literary phenomenon, and if we are to understand how writing and the transmission of literary works operate in the process of meaning making, we need first to recognize this fact of fluidity and also devise critical approaches, and a critical vocabulary, that will allow us to talk about the meaning of textual fluidity in writing and in culture.

(Bryant 2002, 1-2 [emphasis added])
Facsimiles
Proemium.

Inter manuscriptos codices antiquissimae bibliothecae Capituli Metropolitani Pragensis exstat "Scriptum super Apocalypsim cum imaginibus", olim Wenceslai Dortum nomine appellatum, quod praetiosissimis ejusdem thesauris accensum eruditum omnes. Admirantur enim numerosas in eo delineationes ad illustrandum Apocalypsius interpretationem compositas et summa soleritiam exaratas, quae sui temporis vestium tam sacrarum quam saecularium, aedium, armorum aliarumque rerum formam exactam exhibent, et antequam tum artem tum eruditionem mirifice commendant. Quod autem ex periculis judicio peculiare pietate eis addit, nexus est et ut ita dicam cognatio ipsarum cum alis antiquissimis, quibus patria nostra gaudeat, pictaris linearibus, ino momentum etiam, quod in efflorescentem paternam artem nostram habuisse existimantur.

[...]
The prolog of the Wyfe of Bath

[...]xpyment though none Auctoryte
Were in this world ys rygte ynown for me
To speke of wo that ys in maryage
For lordynges Sith y twelve yere was of age

Thanked be god that ys eterne alwaye
Husbandes tyve
But me wey
That sythe
To wedy
That y ney
Herkef end nonys

The lemma for the following word variant or variants is: Experience

Agreeing with the lemma:

- 42 witnesses: Ad1 Ad2 Bo1 Bo2 Ch Cx1 Cx2 Dd Dl Ds1 El En1 En2 Ha2 Ha4 He Hg Hk Ht Lc Ld1 Ln Ma Mc Mg Ne Nl Ph1 Ph3 Ph4 Pn Ps Py Ra1 Ra3 Ry2 Se Si Tc1 Tc3 To1 Wy

Reading: Experiment

- 9 witnesses: Bw Cp Gl La1 Ld1 Mm Ry1 Sl1 Sl2

Reading: [x]xpyment

- 1 witness: F1

Reading: O Experience
a GUIDE to

Electronic
BEOWULF

edited by Kevin Kiernan
with Andrew Prescott, Elizabeth Solopova, David French, Linda Cantara, Michael Ellis, and Cheng Jiun Yuan
The Piers Plowman Electronic Archive

A hypertextual textual archive supported by the National Endowment for the Humanities, the Institute for Advanced Technology in the Humanities at the University of Virginia, and an anonymous donor at the University of Virginia, with additional support from Huntington Adolphus College, Sam Houston State University, and the Dean of Arts and Sciences, the University of Virginia.

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- Site Map
- PPEA FAQ
- Protocols and Procedures
- Contributed
- The Archivist and Their Projects
- Computer Applications and Hardware Used

Related Sites:

- The SEEKET Home Page
- The National Endowment for the Humanities
- NEH Division of Research and Education
- 1998 Report
- NEH Collaborative Research Awards, April 2000
- University of Michigan Press
- SEEKET Series
- MLF
- MFL

University of Virginia Institute for Advanced Technology in the Humanities

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Webmaster: piersehonorat@virginia.edu
Auswahl nach ...

- Nach Bibliotheken (11 Bibliotheken, 442 Codices)
- Handschriftenart (Inhalt) (418 Codices)
- Autor (130 Codices)
- Werkteil (448 Codices)
- Alter (447 Codices)
- Entstehungsort (229 Codices)

<table>
<thead>
<tr>
<th>Signatur</th>
<th>Inhalt</th>
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<tr>
<td>Cod. 1:</td>
<td>Biblia Sacra</td>
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<tr>
<td></td>
<td>(2. Hälfte 9. Jh.)</td>
</tr>
<tr>
<td>Cod. 2:</td>
<td>Biblia Sacra</td>
</tr>
<tr>
<td></td>
<td>(2. Hälfte 13. Jh.)</td>
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<tr>
<td>Cod. 3:</td>
<td>Origenes: Opera selecta</td>
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<td>(9. Jh.)</td>
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<tr>
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<td>Smaragdus de S. Mihiel: Commentarius in Psalms</td>
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<tr>
<td></td>
<td>(10. Jh.)</td>
</tr>
<tr>
<td>Cod. 6:</td>
<td>Testamentum Vetus cum glossa ordinaria</td>
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</table>
Librum IV, Distinctio 1 [Aaruam Transcription]

Diplomatic Transcription

By William de Rothwell

Edited by: Jeffrey C. Wilt
Original Publisher: Lombard Press, Baltimore, MD, September 08, 2015
License Availability: Free. Published under a Creative Commons Attribution-NonCommercial-NoDerivs 3.0 License

Quoniam qui ad sacramentum Respondo Augustinus de civitate dei et in litera Sacramentum est sacrare ne signum hoc est larga item Augustinus doctrina christianae sacramentum est inviolabile grandae validis formae / magister addit ita ut eos simulamenti generat et causa existat item Augustinus sa

rument est in quo sub regimento rei publice simulacrum in aliena virtus secretus operatur saltem / Quaeque huius in libro sacra sacramento est materiale elementum extrinsecus occultum suppositum ex institutione

significans ex simulatiune reipresentans ex sanctificatione aliqua materia

taliam graminum conferens / tota tamen quod sacramentum dictum vel que sanct/ tamen tament significat vel tantum facit vel utrumque / primum cense sacra

mentis veterni legis / tertium / novi legis / secundum / autem dicitur sacramentum

significatum vel secretum / ut passes et hancamod...
Genetic and documentary editing
Material Dynamics

Critique Génétique (ITEM, 1968)

TEI Genetic Editions SIG (2009/2011)

Dynamic editions (e.g. Perstling 2007/2013, Rehbein 2010)

Textual dynamics and materiality: writing process represented in and encoding and interaction
Representing the Document

“Diplomatic transcription” (e.g. “Record Type” 1774-1900), from fonts to Unicode (1991)/MUFI (2001)

Documentary Editing (Tanselle 1978)

[Charters Encoding Initiative](http://example.com) (Vogeler 2004, Winslow/Vogeler 2018/19)

TEI P5 (2007)


Encoding of visual details
Text Encoding Initiative
Manuscript and Object Description
• Core module (Chapter 3) contains some material features (such as `<hi>` to mark ‘highlighting’)

• Manuscript Description (Chapter 10) enables detailed metadata for a manuscript including its physical description

• Representation of Primary Sources (Chapter 11) mostly contains elements for marking physical reality of the object including:
  ○ mod, add, del (and subst), retrace,
  ○ facsimiles, surfaces, zones, sourceDoc, line
  ○ metamark, surplus, space, transpose, damage
<msDesc xml:id="MySampleManuscript" xml:lang="en">
    <msIdentifier>
        <msName>My Manuscript</msName>
    </msIdentifier>
    <msContents>
        <p>One or more paragraphs concerning the manuscript's contents</p>
    </msContents>
    <physDesc>
        <p>One or more paragraphs concerning the manuscript's physical description</p>
    </physDesc>
    <history>
        <p>One or more paragraphs concerning the manuscript's history</p>
    </history>
</msDesc>
objectDesc form="codex">
  <supportDesc material="parch">
    <support>Material</support>: parchment, of mediocre quality, with numerous flaws, irregular edges, and pronounced hair/flesh-side differences.</support>
    <extent>i/ii (modern card/paper) + ii (medieval parchment) + 168 + ii (medieval parchment).
    <dimensions type="leaves" unit="mm">
      <height max="305" min="300">300.5</height>
      <width>220</width>
    </dimensions>
    <dimensions type="ruled" unit="mm">
      <height min="234" max="239">234.9</height>
      <width min="163" max="146">163.4</width>
    </dimensions>
  </supportDesc>
  <extreme>
    <extent>Foliated in modern pencil, i-v, 1-170
      (a former foliation left fols. i-iii blank, and numbered fols. iv, and v as 'i' and 'ii'; this was altered, 5 Aug. 1997); a 15th-/16th-century hand foliated fols. 1-4 in ink in the centre of the top margin, in arabic numerals.</extent>
  </extreme>
  <collation>
    <formula>I-XIV hi rend="sup">12</formula> (fols. 1-168)</collation>
  <catchwords>Catchwords in all quires except the last, in the script of the main text, a little below the right-hand side of the right-hand column of text.</catchwords>
  <signatures>No leaf signatures visible.</signatures>
</supportDesc>
  <layout ruledLines="45 46" columns="2">Ruled with 45 (Quires I-II, fols. 1-24) or 46 (Quires III-XIV, fols. 25-168) lines of text in 2 columns, in brown ink (Quires I-II), and in grey/brown 'pencil'/'crayon' (Quires III-XIV), each column with single vertical bounding lines extending the full height of the page, the top and bottom horizontal lines extending the full width; fols. 162v-168r ruled with a considerably narrower inter-columnar space; each column 74-5 mm. wide.</layout>
</objectDesc>
New: `<objectName>, <listObject>, <object>, <objectIdentifier>`

These elements for the full description of objects (which are not manuscripts but is strongly based on manuscript description) were added in January 2019.

<p>
The <objectName ref="#MinsterLovellJewel">Minster Lovell Jewel</objectName> is probably the most similar to the <objectName ref="#AlfredJewel">Alfred Jewel</objectName> and was found in <placeName ref="#MinsterLovell">Minster Lovell</placeName> in <placeName ref="#Oxfordshire">Oxfordshire</placeName> and is kept at the <orgName ref="#AshmoleanMuseum">Ashmolean Museum</orgName>.
</p>
The Alfred Jewel is about 6.4 cm in length and is made of combination of filigreed gold surrounding a polished teardrop shaped piece of transparent quartz. Underneath the rock crystal is a cloisonné enamel image of a man with ecclesiastical symbols. The sides of the jewel holding the crystal in place contain an openwork inscription saying "AELFRED MEC HEHT GEWYRCAN", meaning 'Alfred ordered me made'.

It is generally accepted that the Alfred Jewel dates from the late 9th Century and was most likely made in England. The jewel was discovered in 1693 at Petherton Park, North Petherton in the English county of Somerset, on land owned by Sir Thomas Wroth. North Petherton is about 8 miles away from Athelney, where King Alfred founded a monastery. A description of the Alfred Jewel was first published in 1698, in the Philosophical Transactions of the Royal Society. It was bequeathed to Oxford University by Colonel Nathaniel Palmer (c. 1661-1718) and today is in the Ashmolean Museum in Oxford.
Gathering assembly: VisColl
Book in Codex Format

‘a collection of sheets of any material, folded double and fastened together at the back or spine, and usually protected by covers’. ¹

A group of folded or single leaves which can be used either singly or with other gatherings to create a textblock.

The gathering is the ultimate working unit of the codex.

(Andrist, Patrick, Paul Canart, and Marilena Maniaci. 2013. *La syntaxe du codex*. Bibliologia 34. p. 50)
Lausanne, Bibliothèque cantonale et universitaire de Lausanne / Ms 350 /
ff. 1r-3r(www.e-codices.unifr.ch).
gathering assembly description
collation formulas

i, 1-9 (8), 10 (6), 11-20 (8), 21 (7), i

I-III<sup>8</sup>, IV<sup>10</sup>, V-IX<sup>8</sup>

IV(32), IV-1(40), 9 IV(120), IV-4

1-4<sup>8</sup>, 5<sup>2</sup>, 6<sup>4-1</sup>, 7-10<sup>10</sup>

1-7.<sup>7</sup>IV<sup>f.1-23,23bis,24-55</sup> + <sup>8</sup>(IV<sup>+[1 f.58]</sup>)<sup>f.64+</sup>

9-11.<sup>3</sup>IV<sup>f.88</sup> + <sup>12</sup>(IV-pos.4<sup>=f.92</sup>+[1 f.92])<sup>f.96</sup>

+ <sup>13-22</sup>10.IV<sup>f.176</sup> + <sup>23</sup>(4/3)<sup>f.183</sup>
collation formulas

i, 1-9 (8), 10 (6), 11-20 (8), 21 (7), i

I-III$^8$, IV$^{10}$, V-IX$^8$

IV(32), IV-1(40), 9 IV(120), IV-4

1-4$^8$, 5$^2$, 6$^{4-1}$, 7-10$^{10}$

1-7. IV$^{f.1-23,23bis,24-55} + 8(IV [+1f.58]) f.64 +$

9-11. 3. IV$^{f.88} + 12(IV-\text{po} s.4 = f.92 [+1f.92]) f.96 +$

13-22. 10. IV$^{f.176} + 23(4/3) f.183$

NOT STANDARDIZED
Gathering assembly description

Visualization Modules

Gathering diagrams

Digital facsimile (bifolium view)

modeller

XML

XSLT

collation formula

... etc.
AUTOMATED DIAGRAMS
digital Galen Syriac palimpsest

http://dorpdev.library.upenn.edu/collation
http://digitalgalen.net/
EVT 2.0
Edition Visualization Technology

http://evt.labcd.unipi.it/
future developments
Page-level semantic tagging

Annotation Modules
- Taxonomy selection
- Annotation mapping (down to page level)

Gathering assembly description

modeller

XML
- Image list
- TEI

XSLT
- collation formula

Visualization Modules
- Gathering diagrams
  - One-page-per-quire view
  - Single page view
New visualizations

Synoptical representation of chart A 558 (quire diagram)

Synoptic charts
New visualizations

Folio folding  Quarto folding  Octavo folding

Folio (section)  Quarto section  Octavo section

Folio "opening"  Quarto "opening"  Octavo "opening"

Format

(c) Folger Shakespeare Library  shelfmark M2334.5
Gathering assembly description

modèle

XML

XSLT

collation formula

... etc.

Visualization

Modules

Gathering diagrams

Digital facsimile
(bifolium view)
https://github.com/leoba/VisColl
Advanced Imaging Technologies and the Sciences
Infrared, Multi- and Hyperspectral Imaging

• non-destructive optical technologies
• in-depth analysis of manuscripts
• capture non-visible ranges of the spectrum
• measure reflectance characteristics of a manuscript page surface under non-visible light conditions
• identify ink, recover faded or hidden text
• draw conclusions about the place and date of production
Fig. 1: Visual appearance (on left) compared to pseudocolor rendering (on right) of a section of an Archimedes Palimpsest leaf (f. 9r–91v of the Euchologion overtext) including gutter. The visibility of the undertext relative to the parchment is enhanced because of the rendering in a contrasting color.
Revealing the lost codex of Archimedes

How do you read a two-thousand-year-old manuscript that has been erased, cut up, written on and painted over? With a powerful particle accelerator, of course! Ancient books curator William Noel tells the fascinating story behind the Archimedes palimpsest, a Byzantine prayer book containing previously-unknown original writings from ancient Greek mathematician Archimedes and others.

TEDxSummit | April 2012

1,005,644 views
Beta Radiography / X-Ray Photography

- paper thickness tested in mid 1940s in the USA
- in the late 1950s Russian scientists published the first high quality and high contrast images of watermarks and paper mould
- since then more refined, safe and efficient methods (electron, soft-x-ray radiography)
- alternative technology for watermark studies: thermography
Comparision Soft X-Ray Radiography / Tracing (Picard online)
1. **X-ray source**
2. **Book / incunabulum**
3. **Electron transmitter / Metal foil**
4. **Folio with watermarks**
5. **Film**
6. **Object slide / table**

### Beta radiography

### Electron radiography

### Soft-X-ray radiography

1. **X-ray source**
2. **Items with watermarks**
3. **Film**
4. **Object slide**
X-Ray Spectrometry / Fluorescence

- chemical composition of ink
- remains on a manuscript or papyrus surface
- salt crystals
- erased writings
Revealing letters in rolled Herculaneum papyri by X-ray phase-contrast imaging

Vito Mocella, Emmanuel Brun, Claudio Ferrero & Daniel Delattre

Nature Communications 6, Article number: 5895 (2015)
doi:10.1038/ncomms6895
Accepted: 19 November 2014
Published online: 20 January 2015

Abstract
Figure 1: Two words read on a hidden layer of the fragment PHerc.Paris. 1 fr. 101.

From: Revealing letters in rolled Herculaneum papyri by X-ray phase-contrast imaging

(a) The sequence of Greek capital letters ΠΠΙΣΩΕ (pi-iota-pi-tau-omicron-iota-epsilon); (b) The letter sequence of the next line, ΕΙΠΟΙ (epsilon-iota-pi-omicron-iota).
(a) carbonized papyrus scroll \( PHerc.Paris. 4 \) (~16 cm length), extremely fragile

(b) three orthogonal slices, and (c) a volume rendition of the reconstructed papyrus
DNA

• in the mid 1990s first time successfully extracted from parchment
• extracting and analysing genetic information
• research on parchment production and the potential influence of diet, urbanisation, animal husbandry and trade
• Two major problems
  – destructive (samples of 0.5 x 0.5 cm or 5 mg needed)
  – storage of extracted DNA (needs to be frozen to preserve integrity)
Animal origin of 13th-century uterine vellum revealed using noninvasive peptide fingerprinting


Author Affiliations

Edited by Michael G. Cantorna, Smithsonian National Zoological Park, Washington, DC, and accepted by the Editorial Board October 22, 2015 (received for review June 23, 2015)

Abstract

Tissue-thin parchment made it possible to produce the first pocket Bibles: Thousands were made in the 13th century. The vellum was prepared from dehydrated skin, which was then soaked in water. To understand the origin of the leather, we investigated the biological markers, including fingerprinting. Our research shows that the parchment was made from secondary products of animals. Our results reveal how parchment was made during this time, how it was used, and how it was preserved. This new information provides a better understanding of the history of parchment.
On the left, the distorted parchments ... On the right, the documents are virtually restored, flattening the folios and removing the distortion.
Reflectance Transformation Imaging (RTI)

• origins from HP Labs (2001)
• based on *Polynomial Texture Mapping* (PTM)
• non-invasive and non-contact recording method
• cost & time effective
• easy to learn
• transportable
• currently developed by
  – Cultural Heritage Imaging (CHI)
  – Visual Computing Lab of CNR-ISTI
Materiality in Future Digital Editions
Editing is all about abstraction.
Editing is all about representation.
Editing is all about perspective.
Editing is all about technology.
Editing is all about standards.
Editing is all about presentation.
Physicality and Materiality

Physicality

the infinite set of physical attributes
that make up the reality of the object.

Physicality and Materiality

Materiality
an emergent property
that depends on the attention of some observer
who isolates as meaningful some particular attributes, setting them aside from the
continuum of physicality.

Material Sciences allow us to gather additional data

Datasets

Reference libraries

Scholar engagement
(Multi)Spectral Imaging

XRF

FTIR

FORS

etc.
MODEL

Metadata/
controlled vocabularies

(Multi)Spectral Imaging
FORS
Micro CT
XRF
FTIR
etc.