

# HISTORICAL SOURCES THROUGH THE LENSES OF DIGITAL HUMANITIES PROJECTS:

## WHAT DO WE SEE?



Dr ARIANNA CIULA

DEPARTMENT of HUMANITIES

UNIVERSITY of ROEHAMPTON (LONDON, UK)

[ARIANNA.CIULA@ROEHAMPTON.AC.UK](mailto:ARIANNA.CIULA@ROEHAMPTON.AC.UK)

@ARICIULA

Summer School 2016 „Digitale Edition – Grundlagen“

University of Graz, 5 September 2016

# DIGITAL HUMANITIES (DH)

“digital humanities explores how the questions posed in humanities scholarship are transformed and extended by the digital – both by means of tools and epistemologies” (Ray Murray)

- Early-modern European Context → humanistic scholarship intertwined with *FORMAL* and *EMPIRICAL* studies (Bod, Maat and Weststeijn 2010)

The Humanities deeply influenced and even shaped the exact sciences

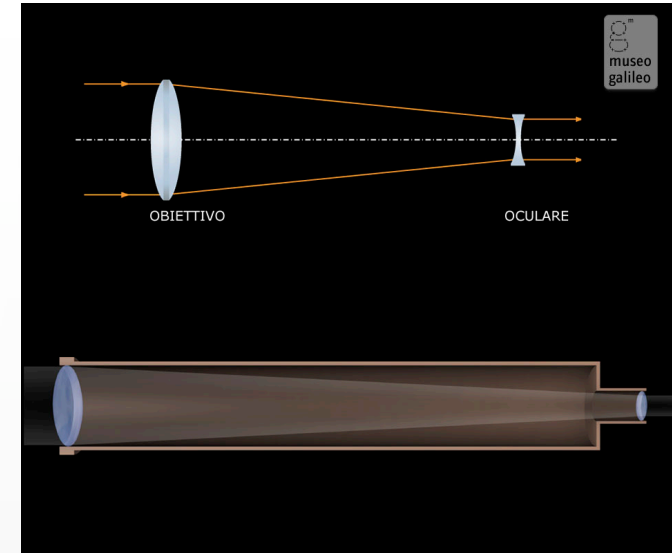
- DH as renewed connection to formal/empirical studies

Is DH different from other formal/empirical Humanities approaches?



# LENS METAPHOR

- Scientific optical instruments
  - Galileo Galilei



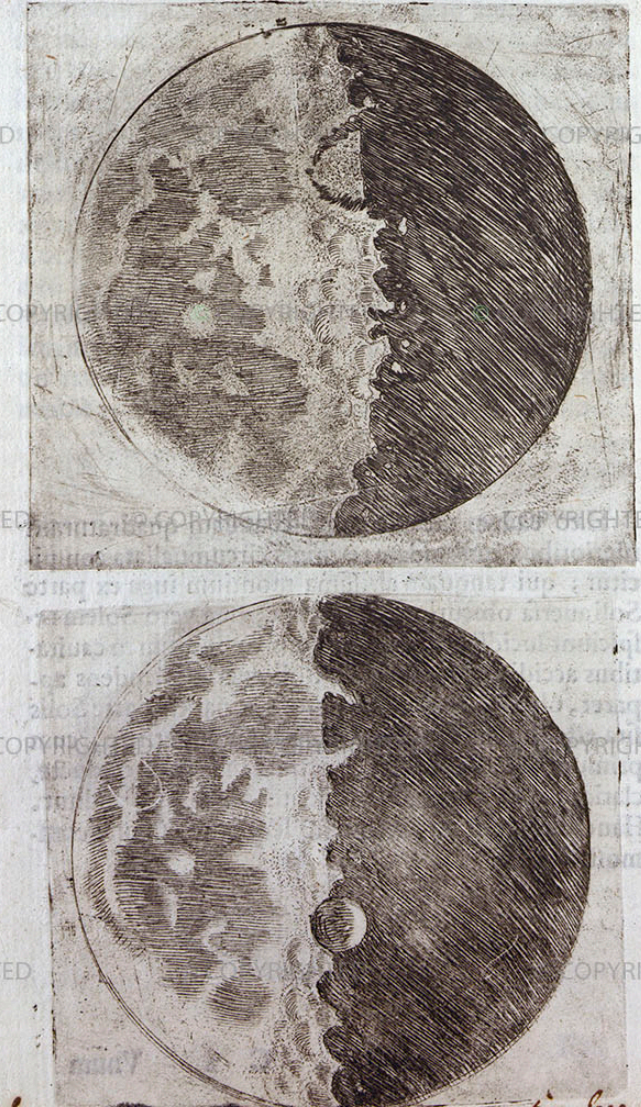
Museo Galileo 2428, 1609-10



# LENS METAPHOR

- Scientific optical instruments
  - Galileo Galilei
  - Our days: from studying the stars to micro-organisms

Galileo Galilei, *Sideurs Nuncius*, 1610  
Firenze, Biblioteca nazionale centrale, Post. 110

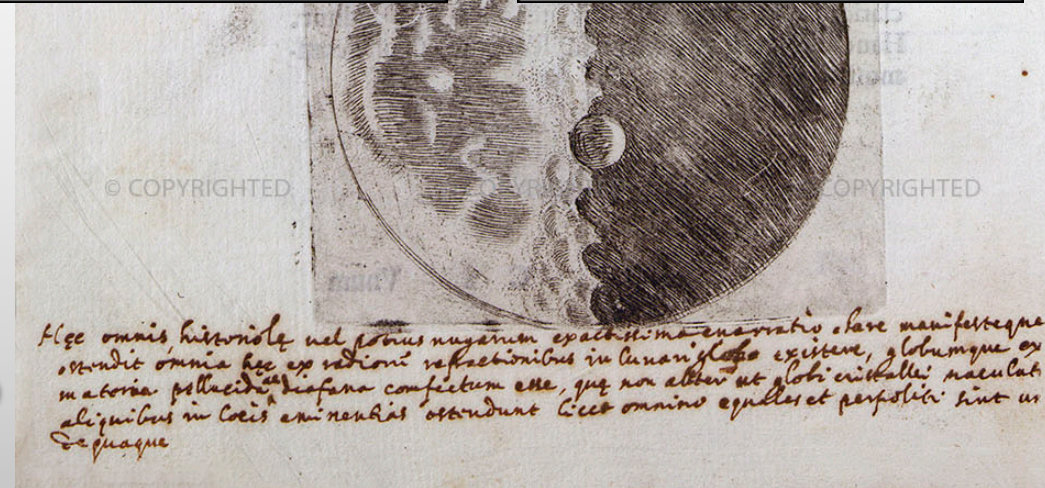
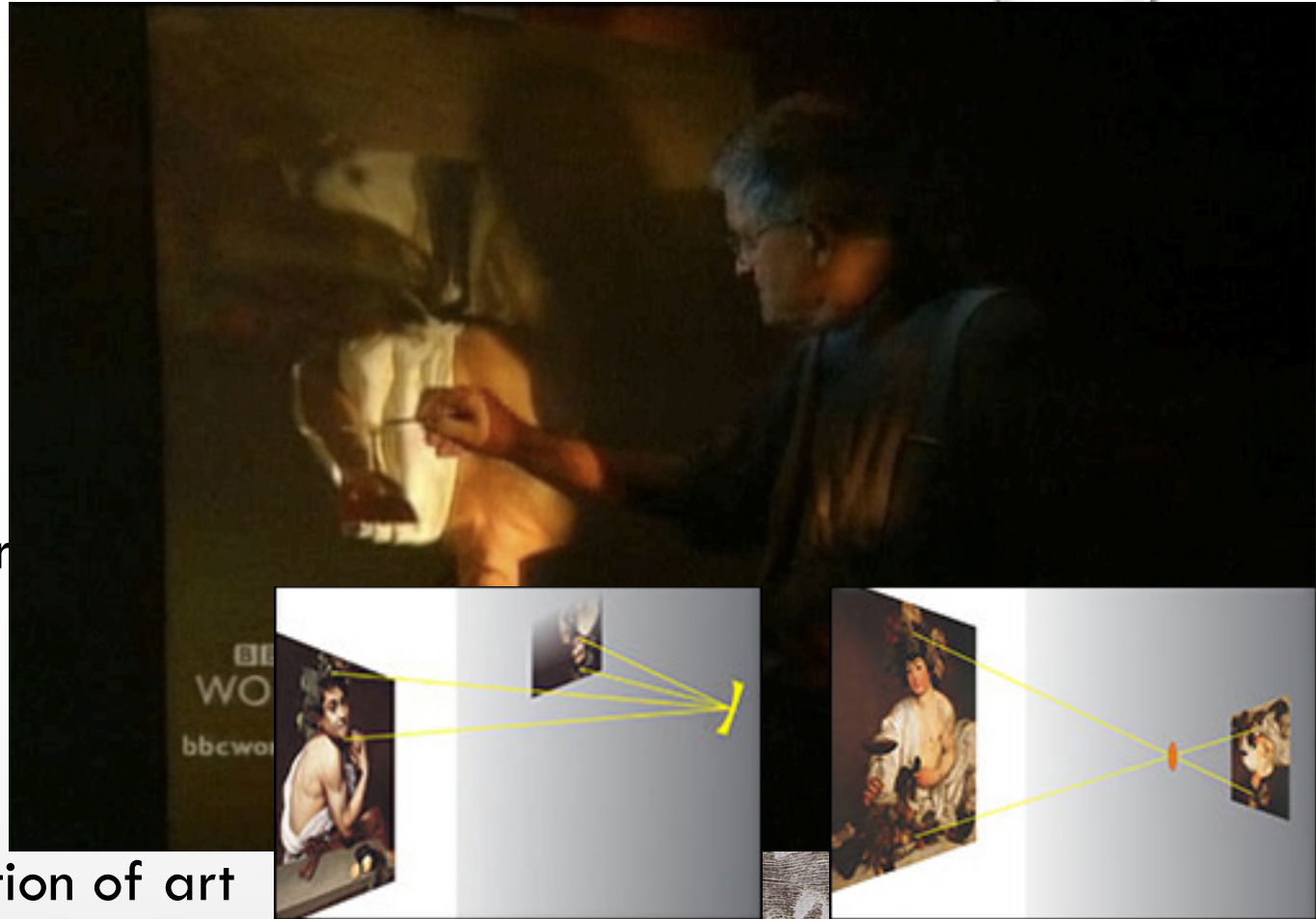


Hec omnis histiola vel potius nugarum epactissima enarratio. Hare manifesteque  
ostendit omnia hec ex radiorum refractionibus in lunari globo existerent, globumque ex  
materia pellucidissima confectum esse, quæ non aliter ut globi cristallini maculæ  
aliquibus in locis eminentias ostendunt. Licet omnino ephemeræ et perfoliæ sint ut  
de quaque



# LENS METAPHOR

- Scientific optical instruments
  - Galileo Galilei
  - Our days: from studying the stars to studying organisms
- Knowledge machine
  - Optical aids used in the production of art
  - Hockney–Falco thesis; visual argument (Hockney 2006)
  - Creating and studying our cultural production



SO... WHAT DO WE SEE?





# OBJECTS

SPECIFICITY of objects of study → typical of the Humanities

E.g. via digitisation

“Digitization involves the creation of a binary representation of an object which already exists, rather than the creation of new and novel pictorial information” (Terras 2008)

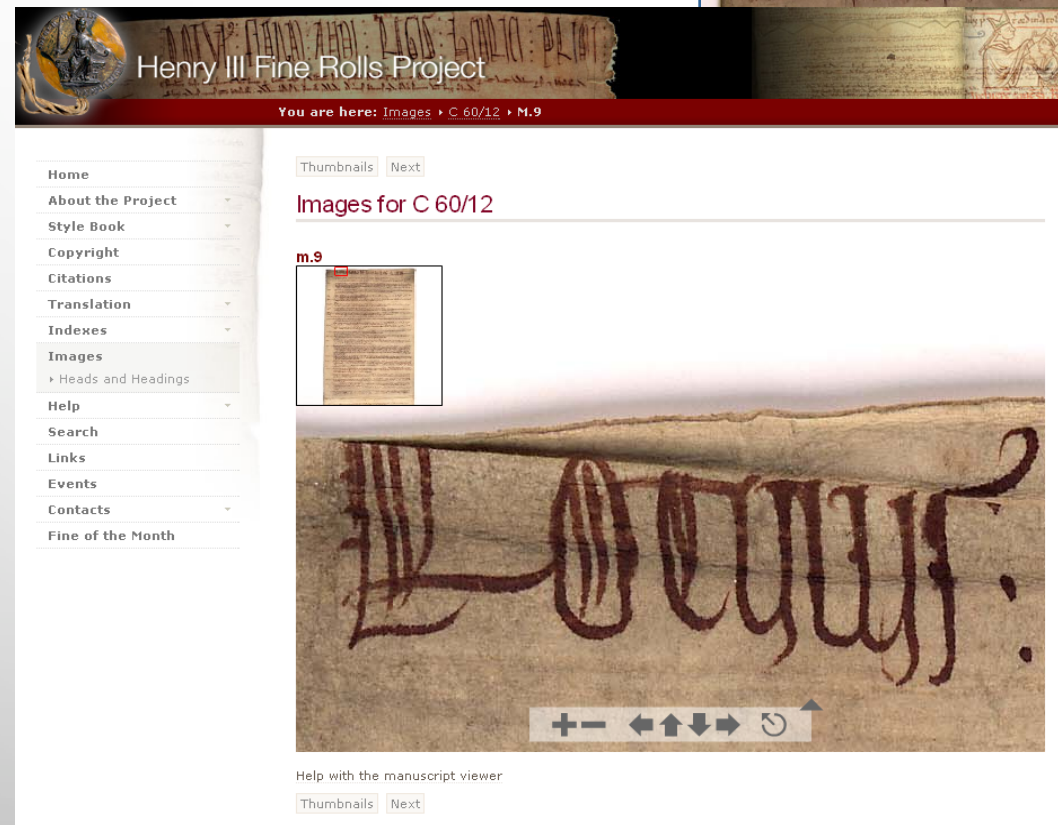
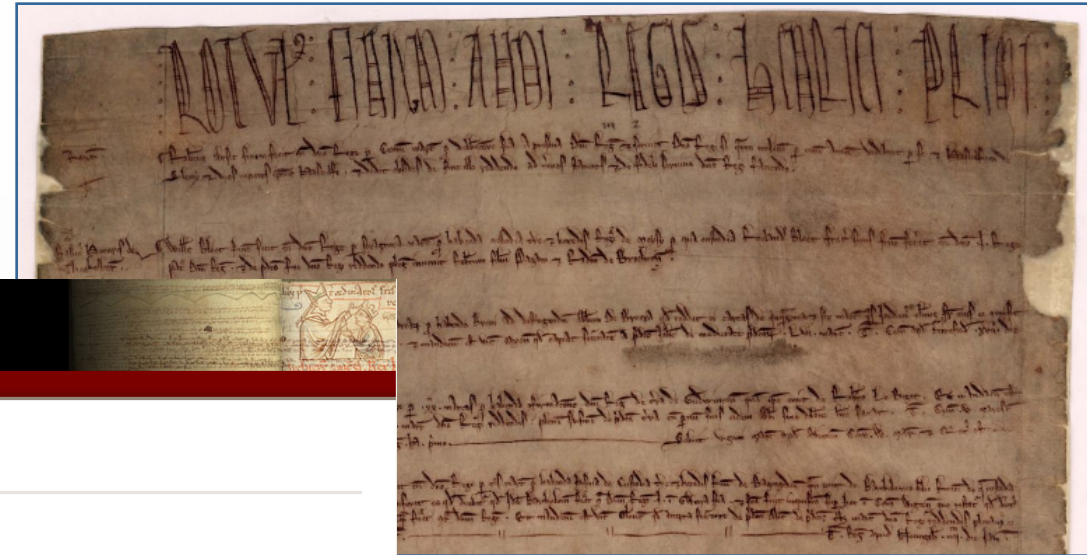
} of  
primary sources

also an interpretative act → make choices and take decisions

# OBJECTS

Archimedes palimpsest project

- Simple but powerful display



Henry III Fine Rolls project

# OBJECTS

Archimedes palimpsest project



- Minute examination & reconstruction of features



## Archimedes palimpsest project



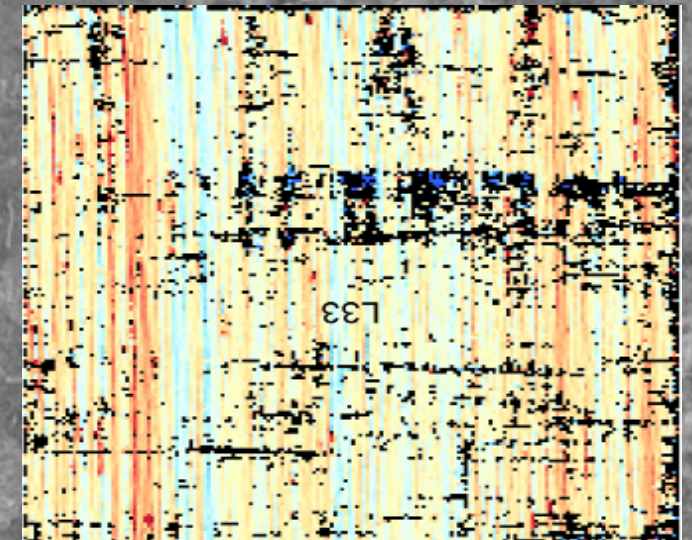
- Minute examination & reconstruction of features



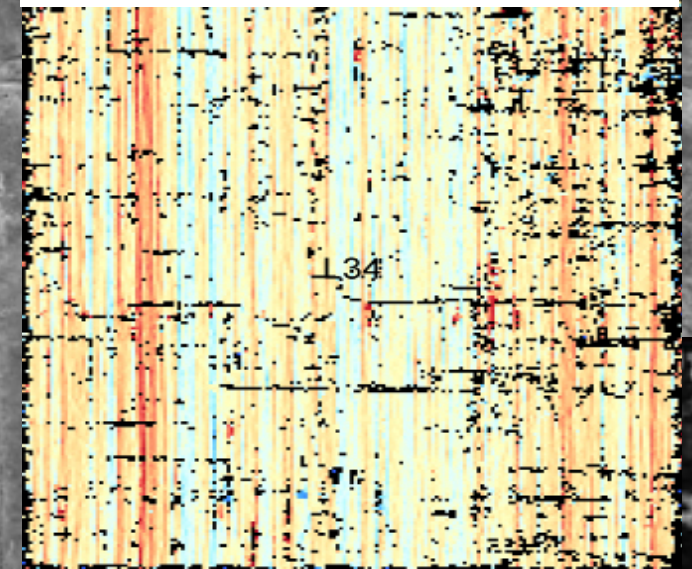




Archimedes palimpsest project



Johnson, Johnson, and Liedtke  
(2012)



- Minute examination & reconstruction of features  
→ DH connected to material culture approaches & material sciences

# OBJECTS

SPECIFICITY + formal  
MODELLING  
(Abstraction,  
classification,  
manipulation)

E.g. via creation and  
manipulation of  
digital models



of  
primary  
sources/components  
production/  
transmission/use

The UML class diagram illustrates the relationships between various entities in the Digipal project. The classes and their attributes are as follows:

- Manuscript**: settlement : String, repository : String, shelfmark : String
- MSPart**: extent : String
- Page**: number : Integer, image : File
- Alphabet**: name : String
- Grapheme**: name : String
- Character**: char : Char
- Script**: name : String
- Allograph**: script : String
- Scribe**: name : String
- Idiograph**: scribe : String
- Scribal Hand**: description : String
- Graph**: coordinates : Integers
- Component**: name : String
- GeneralFeature**: description : String
- ComponentFeature**: description : String

The relationships between these classes are defined by the following associations:

- Manuscript** (0..\*) is associated with **MSPart** (1) via a composition relationship (indicated by a filled diamond on the Manuscript side).
- MSPart** (1) is associated with **Page** (1..\*) via a composition relationship (indicated by a filled diamond on the MSPart side).
- Page** (1) is associated with **Alphabet** (0..\*) via a composition relationship (indicated by a filled diamond on the Page side).
- Alphabet** (1) is associated with **Grapheme** (1..\*) via a composition relationship (indicated by a filled diamond on the Alphabet side).
- Grapheme** (1) is associated with **Character** (1..\*) via a composition relationship (indicated by a filled diamond on the Grapheme side).
- Character** (0..\*) is associated with **Component** (0..\*) via a composition relationship (indicated by a filled diamond on the Character side).
- Script** (0..\*) is associated with **Allograph** (0..\*) via a composition relationship (indicated by a filled diamond on the Script side).
- Script** (1) is associated with **Allograph** (1..\*) via a composition relationship (indicated by a filled diamond on the Script side).
- Scribe** (0..\*) is associated with **Idiograph** (0..\*) via a composition relationship (indicated by a filled diamond on the Scribe side).
- Scribe** (1) is associated with **Idiograph** (1..\*) via a composition relationship (indicated by a filled diamond on the Scribe side).
- Scribal Hand** (0..\*) is associated with **Idiograph** (0..\*) via a composition relationship (indicated by a filled diamond on the Scribal Hand side).
- Scribal Hand** (1) is associated with **Idiograph** (1..\*) via a composition relationship (indicated by a filled diamond on the Scribal Hand side).
- Idiograph** (1) is associated with **Graph** (0..\*) via a composition relationship (indicated by a filled diamond on the Idiograph side).
- Idiograph** (0..\*) is associated with **Graph** (0..\*) via a composition relationship (indicated by a filled diamond on the Idiograph side).
- Graph** (0..\*) is associated with **Component** (0..\*) via a composition relationship (indicated by a filled diamond on the Graph side).
- Graph** (0..\*) is associated with **GeneralFeature** (0..\*) via a composition relationship (indicated by a filled diamond on the Graph side).
- Graph** (0..\*) is associated with **ComponentFeature** (0..\*) via a composition relationship (indicated by a filled diamond on the Graph side).
- Component** (0..\*) is associated with **GeneralFeature** (0..\*) via a composition relationship (indicated by a filled diamond on the Component side).
- Component** (0..\*) is associated with **ComponentFeature** (0..\*) via a composition relationship (indicated by a filled diamond on the Component side).

# SPECIFICITY + formal MODELLING (Abstraction, classification, manipulation)

E.g. via creation and manipulation of digital models

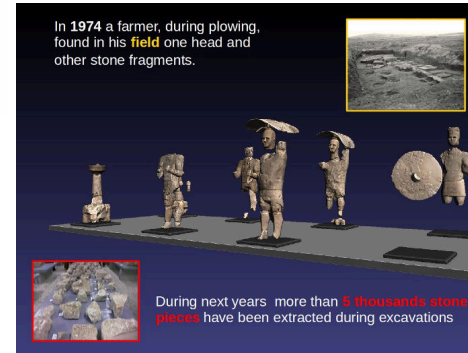


# OBJECTS

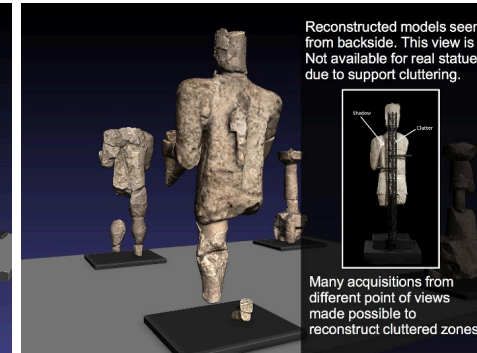
Balsa Rodriguez et al. 2015

SPECIFICITY + formal  
MODELLING  
(Abstraction,  
classification,  
manipulation)

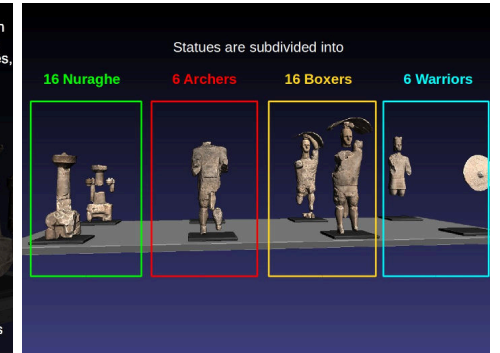
E.g. via creation and  
manipulation of  
digital models



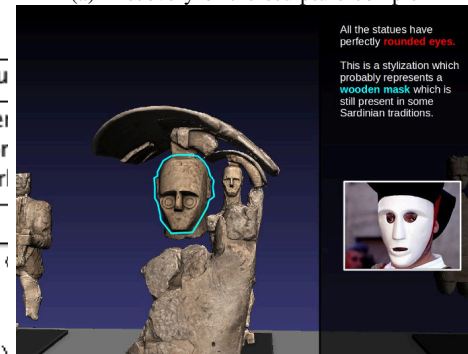
(a) Discovery of the sculpture complex



(b) Digital acquisition



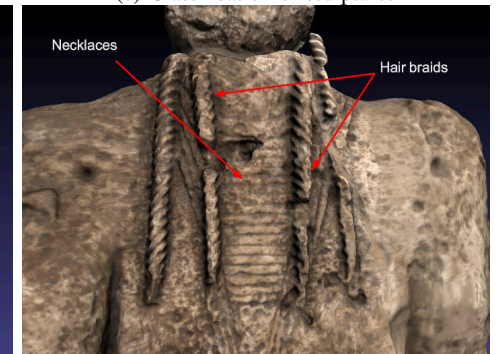
(c) Classification of sculptures



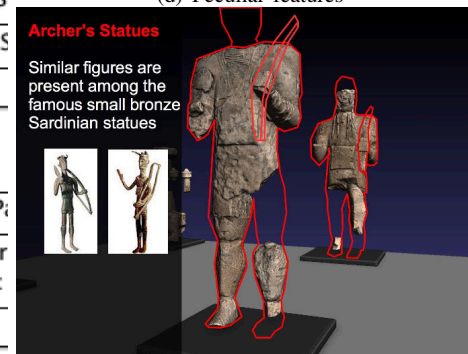
(d) Peculiar features



(e) Measure information



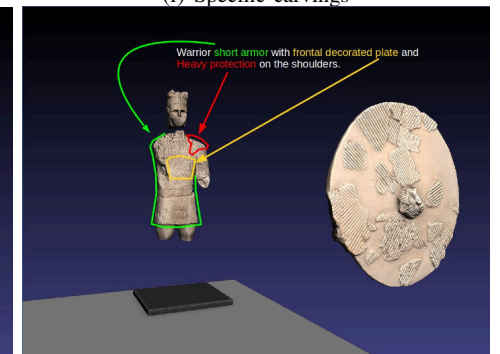
(f) Specific carvings



(g) Connections to other artworks



(h) Comparisons to other buildings



(i) Highlights of sculpture parts



# OBJECTS

SPECIFICITY + formal  
MODELLING  
(Abstraction,  
classification,  
manipulation)

E.g. via creation and  
manipulation of  
digital models



of texts  
and historical entities

# OBJECTS

SPECIFICITY + formal  
MODELLING  
(Abstraction,  
classification,  
manipulation)

→ DH connected to textual (critical) scholarship and publishing

E.g. via creation and  
manipulation of  
digital models

```
<supplied reason="lost" cert="low">ὅμο</supplied>λογῶ
```

Transformation using the example EpiDoc P5 stylesheets:

- **Duke Databank style:** [ὅμο(?)]λογῶ

([Source](#))

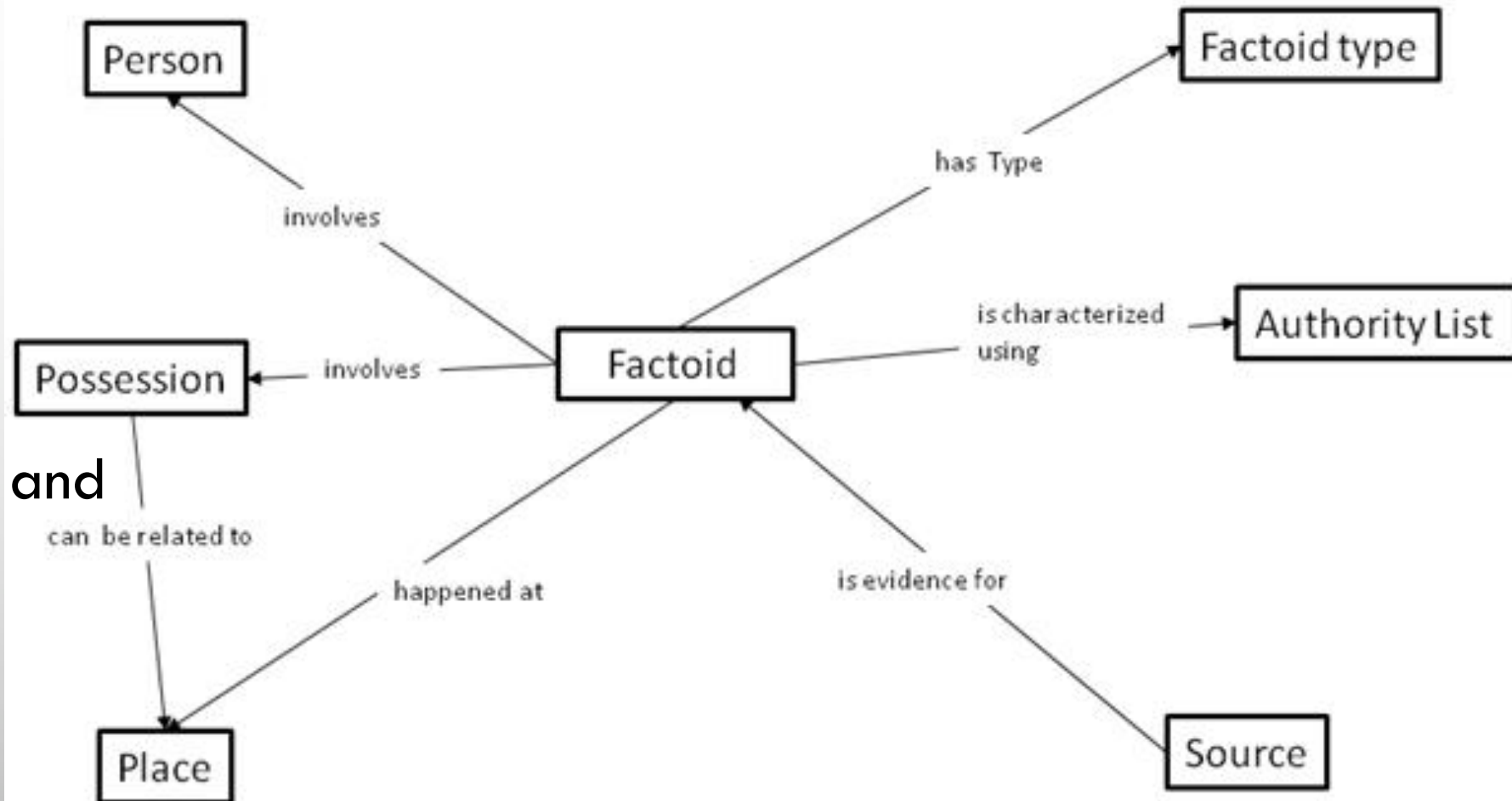
# OBJECTS

SPECIFICITY + formal  
MODELLING  
(Abstraction,  
classification,  
manipulation)

E.g. via creation and  
manipulation of  
digital models

Simplified data structure diagram for factoids

Bradley and Pasin 2013



## A circular seal or coin, likely a papal bull, featuring a central figure (possibly a pope or saint) surrounded by Latin text. The text is arranged in a circular border around the central figure.

Choose graph: ---

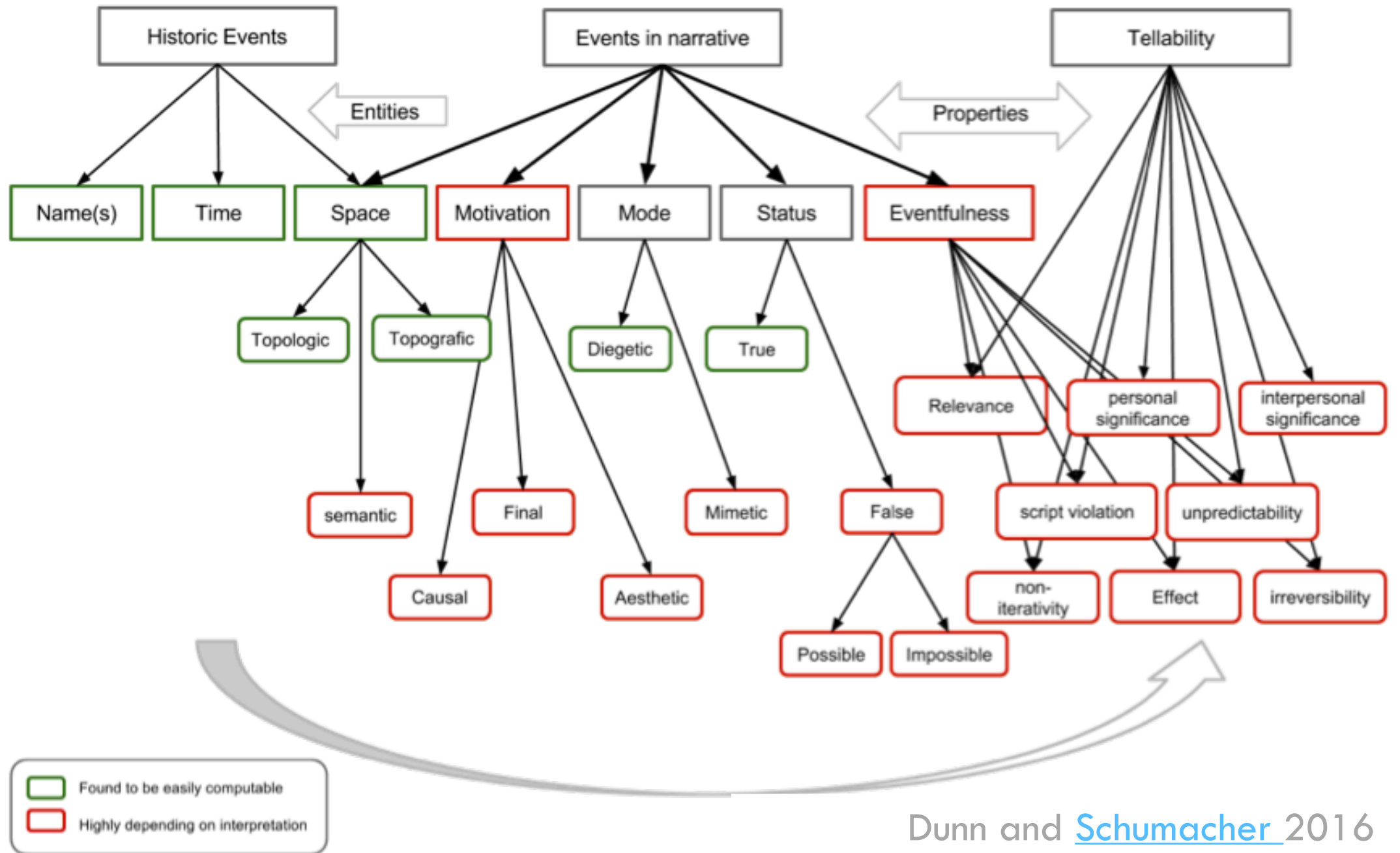
Locate an individual:





[illegible]

Ada, daughter of Earl David, wife of Malise of Strathearn



# OBJECTS

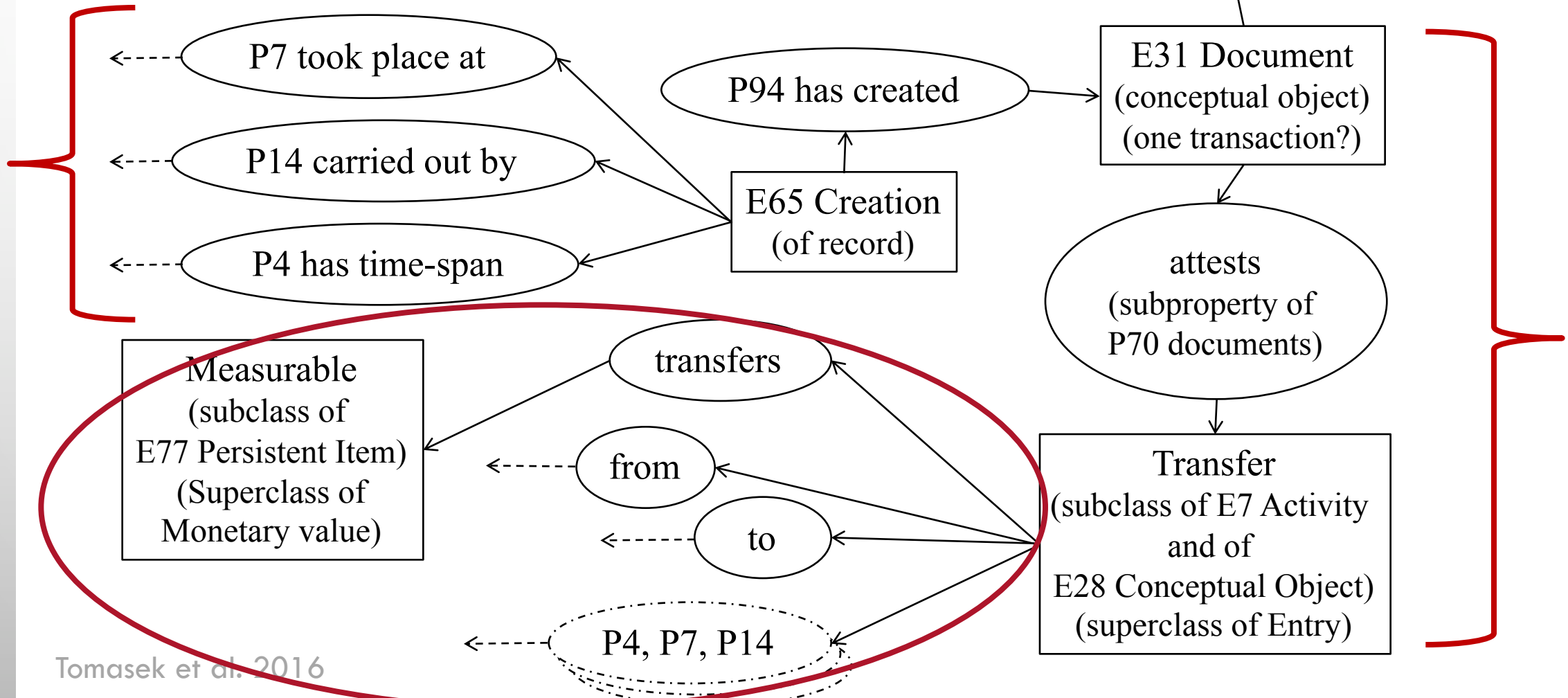
## Blending of perspectives

E.g.

- Textual vs. contextual and material



TEXT and CONTEXTS



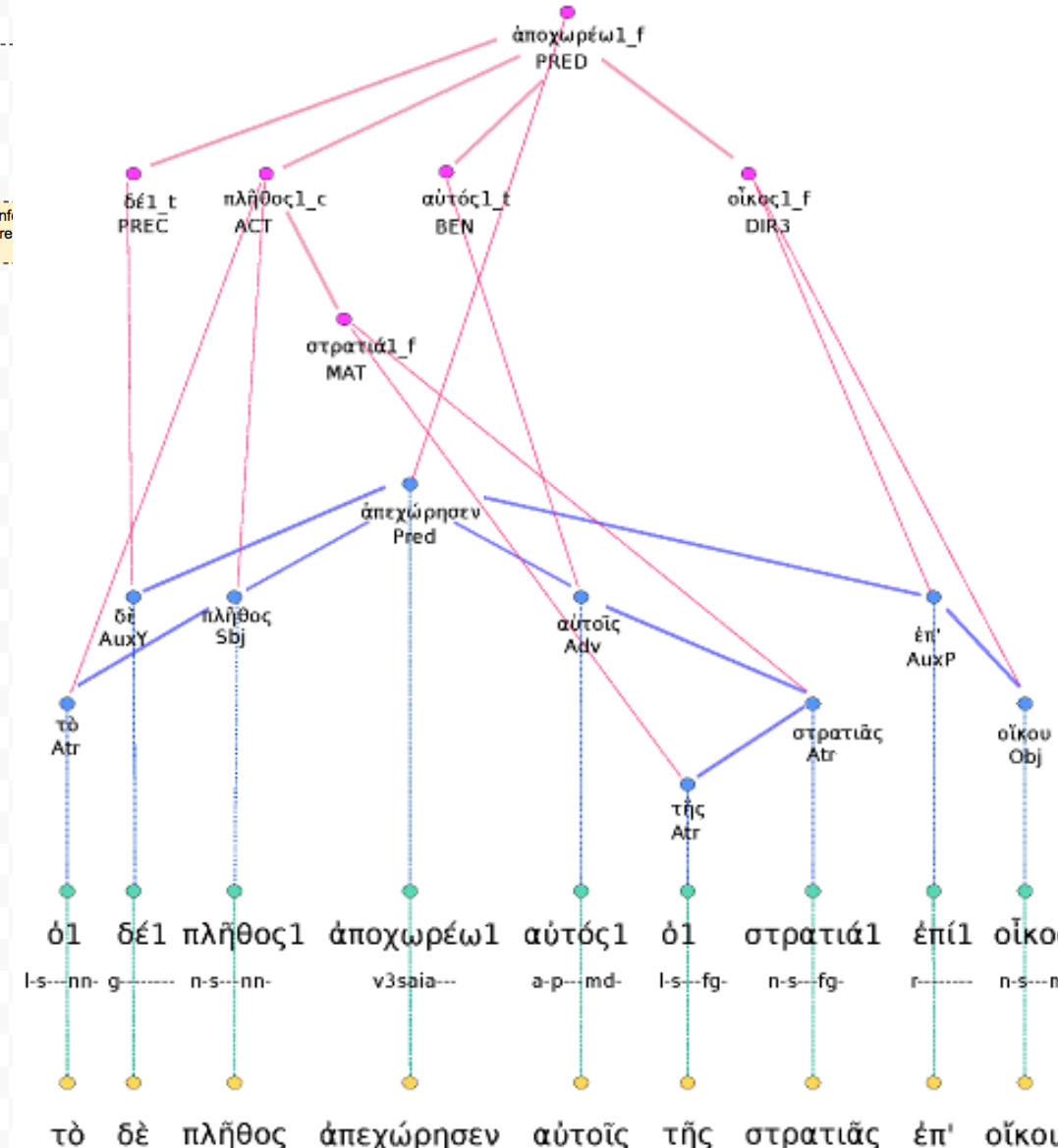
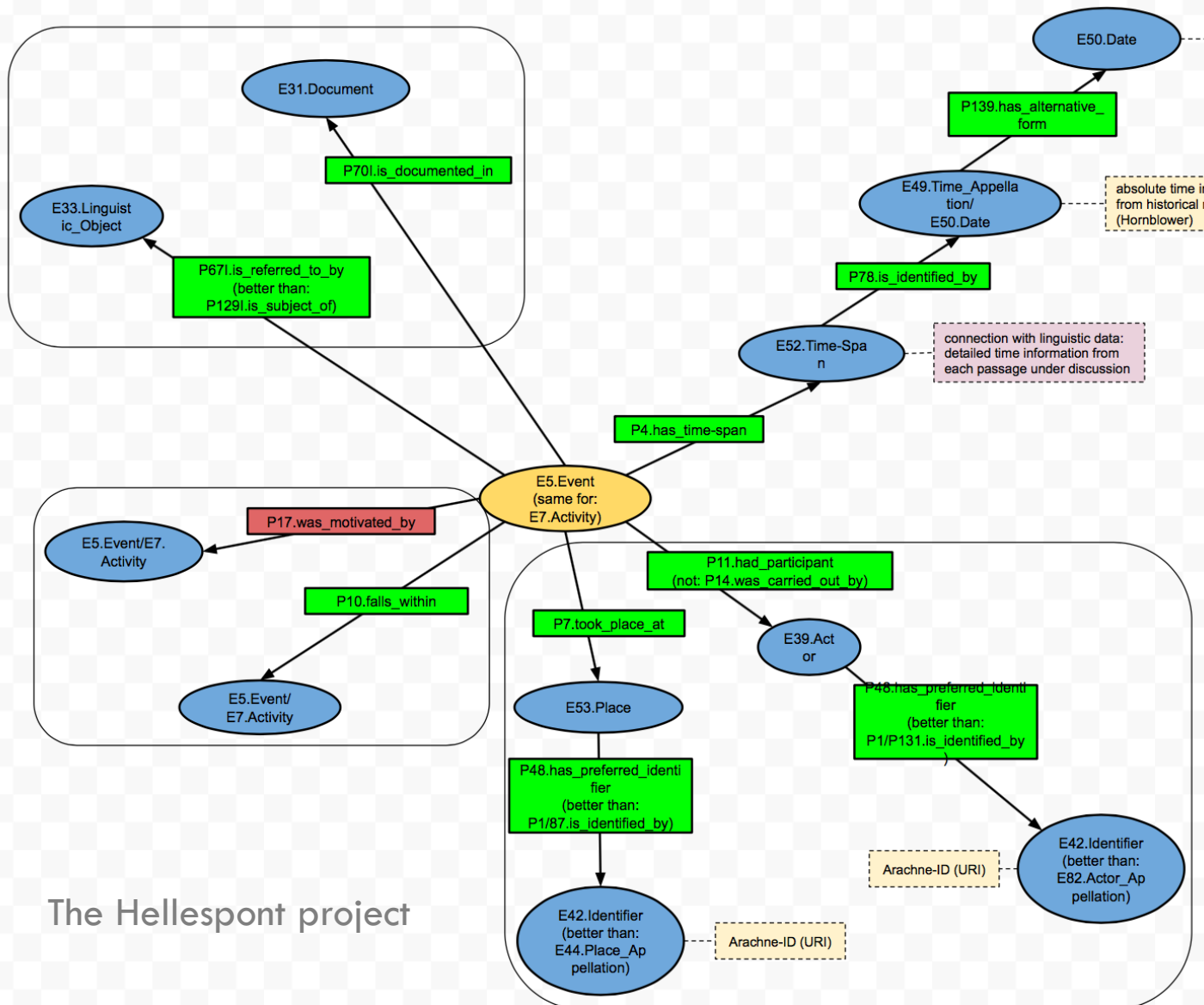
# OBJECTS

## Blending of perspectives

E.g.

- Textual vs. contextual and material
- Historical vs. other disciplines (e.g. linguistics)

# MIXED METHODS / INTER-MULTI DISCIPLINARY





## Section 1

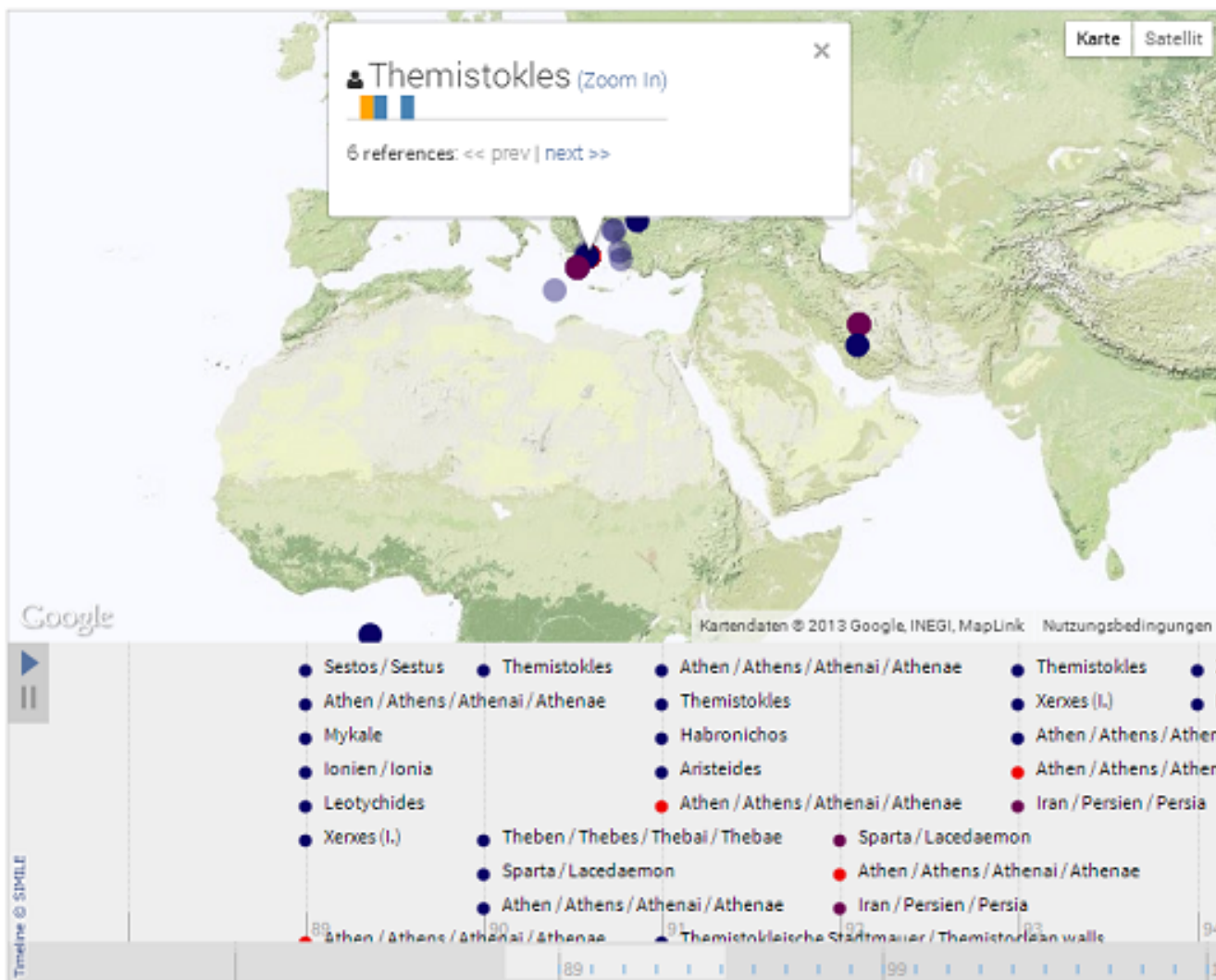
**Λακεδαιμόνιοι** δὲ αἰσθόμενοι τὸ μέλλον ἦλθον πρεσβεία, τὰ μὲν καὶ αὐτοὶ ἦδιον ἂν ὀρώντες μὴτ' ἐκείνους μὴτ' ἄλλον μηδένα **τείχος** ἔχοντα, τὸ δὲ πλεόν τῶν συμμάχων ἐξοστρυνόντων καὶ φοβουμένων τοῦ τε ναυτικοῦ αὐτῶν τὸ πλῆθος, ὃ πρὶν οὐχ ὑπῆρχε, καὶ τὴν ἐς τὸν Μηδικὸν πόλεμον τόλμαν γενομένην.

## Section 2

ἡξιοῦν τε αὐτοὺς μὴ **τειχίζειν**, ἀλλὰ καὶ τῶν ἔξω **Πελοποννήσου** μᾶλλον ὅσοις εἰστήκει ξυγκαθελεῖν μετὰ σφῶν τοὺς **περιβόλους**, τὸ μὲν βουλούμενον καὶ ὑποπτον τῆς γνώμης οὐ δηλοῦντες ἐς τοὺς **Ἀθηναίους**, ὥς δὲ τοῦ **βαρβάρου**, εἰ αὐθις ἐπέλθοι, οὐκ ἂν ἔχοντος ἀπὸ ἐχυροῦ ποθέν, ὥσπερ νῦν ἐκ τῶν **Θηβῶν**, ὁρμᾶσθαι: τήν τε **Πελοπόννησον** πᾶσιν ἔφασαν ἀναχώρησίν τε καὶ ἀφορμὴν ἰκανὴν εἶναι.

### Section 3

οἱ δ' **Ἀθηναῖοι** **Θεμιστοκλέους** γνώμη τοὺς μὲν **Λακεδαιμονίους** ταῦτ' εἰπόντας ἀποκρινάμενοι ὅτι πέμψουσιν ὥς αὐτοὺς πρέσβεις περὶ ὧν λέγουσιν εὐθύς ἀπήλλαξαν· ἑαυτὸν δ' ἐκέλευεν ἀποστέλλειν ὥς τάχιστα ὁ **Θεμιστοκλῆς** εἰς τὴν **Λακεδαίμονα**, ἄλλους δὲ πρὸς ἑαυτῷ ἐλομένους πρέσβεις μὴ εὐθύς ἐκπέμπειν, ἀλλ' ἐπισχεῖν μέχρι τοσούτου ἕως ἂν τὸ **τείχος** ἱκανὸν ἄρῃσιν ὥστε ἀπομάχεσθαι ἐκ τοῦ ἀναγκαιοτάτου ὕψους· **τειχιζεῖν** δὲ πάντας πανδημεὶ τοὺς ἐν τῇ **πόλει** [καὶ αὐτοὺς καὶ νυναικῆς καὶ παῖδας]. φειδομένους μὴτε ἰδίου μὴτε δημοσίου



## The Hellespont project

E42.Identifier  
(better than:  
E44.Place\_Ap  
pellation)

Arachne-ID (URI)

pellation)

τὸ δὲ πλῆθος ἀπεχώρησεν αὐτοῖς τῆς στρατιᾶς ἐπ' οἴκου.

# MEDIUM

## Machines (software and hardware)

- Digital medium as publication medium with own constraints and opportunities



[Previous](#) [Next](#)

## C 60/8

## Document Contents

- ▾ Membrane 2
- ▾ Membrane 1
- ▾ Membrane 1d

## 1 HENRY III (28 October 1216–27 October 1217)

 Images of roll C 60/8
View calendar by date 1216 

Membrane 2

 Image of membrane 2

Roll of fines of the first year of King Henry.

- 1 [No date]. Kent. Robert Arsic has made fine with the king by 100 m. for his delivery from the king's prison, and he is to serve the king with three knights (*se quarto militum*) for a year, namely by Robert himself, Hasculph de Soligny, and two of Hasculph's nephews, and he gave hostages for rendering that fine at the set terms and for performing faithful service to the king.
- 2 17 Dec. *Bailiff of the honour of Tewkesbury*. William Bloet has made fine with the king by 60 m. for having the custody of the land and heir of Roger de Meysey, for which custody Roeland Bloet, his brother, had made fine with King John, the king's father. He found Robert son of Payn and Ralph of Broughton as pledges for rendering the aforesaid fine to the king.
- 3 17 Dec. *Fairford. Oxfordshire*. John of Bristol gives the king the moiety of 56 m. for having a writ to distrain the abbot of Bruern to render to him the charters for 56 m., which Jordan Clerk, his brother, committed to him to keep. <sup>1</sup> He has letters to distrain the abbot, and the sheriff of Oxfordshire is ordered to take security from John for the moiety of the aforesaid 56 m. <sup>2</sup> Witness the earl.
  1. It is possible that the following clause was added later, as the ink is very slightly darker. It is not, however, clearly demarcated from the remainder of the entry as in the other examples on this membrane.
  2. An erasure has been made shortly below the body of the entry.
- 4 30 Dec. *Lichfield. Gloucestershire*. The abbot of Tewkesbury has made fine with the king by 20 m. for having his confirmation of the land of Gotherington, which he purchased from Robert Bigod. Order to the sheriff of Gloucestershire that, having accepted security from him for rendering the aforesaid 20 m. to the king, he is to cause the same abbot to have full seisin of the aforesaid land with its appurtenances without delay. He paid 20 m. at Winchester to W. earl Marshal and is quit. <sup>1</sup> Witness the earl.
  1. The payment to the Marshal is clearly separated from the entry by a horizontal line.

## FINE ROLL

## 1 HENRY III (28 October 1216–27 October 1217)

C 60/8

Membrane 2

ROLL OF FINES OF THE FIRST YEAR OF KING HENRY.

- 1 [No date]. Kent. Robert Arsic has made fine with the king by 100 m. for his delivery from the king's prison, and he is to serve the king with three knights (*se quarto militum*) for a year, namely by Robert himself, Hasculph de Soligny, and two of Hasculph's nephews, and he gave hostages for rendering that fine at the set terms and for performing faithful service to the king.
- 2 17 Dec. *Bailiff of the honour of Tewkesbury*. William Bloet has made fine with the king by 60 m. for having the custody of the land and heir of Roger de Meysey, for which custody Roeland Bloet, his brother, had made fine with King John, the king's father. He found Robert son of Payn and Ralph of Broughton as pledges for rendering the aforesaid fine to the king.
- 3 17 Dec. *Fairford. Oxfordshire*. John of Bristol gives the king the moiety of 56 m. for having a writ to distrain the abbot of Bruern to render to him the charters for 56 m., which Jordan Clerk, his brother, committed to him to keep. <sup>1</sup> He has letters to distrain the abbot, and the sheriff of Oxfordshire is ordered to take security from John for the moiety of the aforesaid 56 m. <sup>2</sup> Witness the earl.
  1. It is possible that the following clause was added later, as the ink is very slightly darker. It is not, however, clearly demarcated from the remainder of the entry as in the other examples on this membrane.
  2. An erasure has been made shortly below the body of the entry.
- 4 30 Dec. *Lichfield. Gloucestershire*. The abbot of Tewkesbury has made fine with the king by 20 m. for having his confirmation of the land of Gotherington, which he purchased from Robert Bigod. Order to the sheriff of Gloucestershire that, having accepted security from him for rendering the aforesaid 20 m. to the king, he is to cause the same abbot to have full seisin of the aforesaid land with its appurtenances without delay. He paid 20 m. at Winchester to W. earl Marshal and is quit. <sup>1</sup> Witness the earl.
  1. The payment to the Marshal is clearly separated from the entry by a horizontal line.



Previous Next

C 60/8

Document Contents

- ▼ Membrane 2
- ▼ Membrane 1
- ▼ Membrane 1d

1 HENRY III (28 October 121

Images of roll C 60/8

Membrane 2

Images of membrane 2

Roll of fines of the first year of

[No date]. Kent. Robert  
prison, and he is to serve  
himself, Hasculph de Soli  
fine at the set terms and for performing faithful service to the king.

3 17 Dec. Fairford. *Oxfordshire*. John of Bristol gives the king the moiety of 56 m. for having a writ to distraint the abbot of Bruern to render to him the charters for 56 m., which Jordan Clerk, his brother, committed to him to keep.<sup>1</sup> He has letters to distraint the abbot, and the sheriff of Oxfordshire is ordered to take security from John for the moiety of the aforesaid 56 m.<sup>2</sup> Witness the earl.

1. It is possible that the following clause was added later, as the ink is very slightly darker. It is not, however, clearly demarcated from the remainder of the entry as in the other examples on this membrane.
2. An erasure has been made shortly below the body of the entry.

for which custody Roeland Bloet, his brother, had made fine with King John, the  
Broughton as pledges for

3 17 Dec. Fairford. *Oxfordshire*. John of Bristol gives the king the moiety of 56 m. for having a writ to distraint the abbot of Bruern to render to him the charters for 56 m., which Jordan Clerk, his brother, committed to him to keep.<sup>1</sup> He has letters to distraint the abbot, and the sheriff of Oxfordshire is ordered to take security from John for the moiety of the aforesaid 56 m.<sup>2</sup> Witness the earl.

the king the moiety of 56  
der to him the charters for  
m to keep.<sup>1</sup> He has letters  
lered to take security from  
arl.  
ghtly darker. It is not, however, clearly  
membrane.

kesbury has made fine with  
of Gotherington, which he  
oucestershire that, having  
20 m. to the king, he is to  
and with its appurtenances  
rshal and is quit.<sup>1</sup> Witness

line.

the king, he is to serve the same charters to the king, and he is to serve the king without delay. He paid 20 m. at Winchester to W. earl Marshal and is quit.<sup>1</sup> Witness the earl.

1. The payment to the Marshal is clearly separated from the entry by a horizontal line.

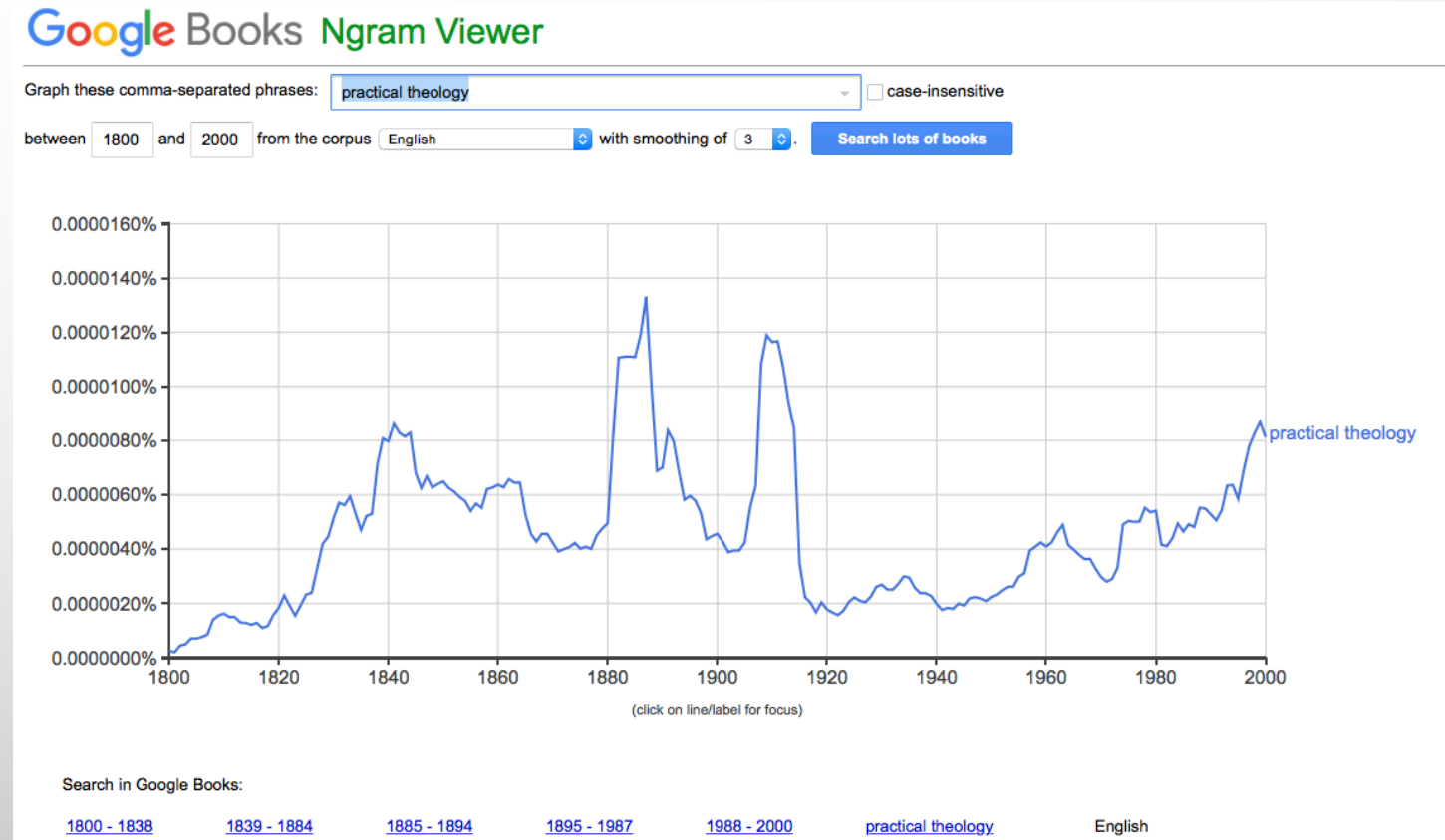
→ DH connected to information studies

→ DHers creating new intermediaries to the past

# MEDIUM

## Machines (software and hardware)

- Digital medium as publication medium with own constraints and opportunities
- Means for operationalising concepts – e.g. algorithms and datasets
  - How to correlate methods in (big) data analytics to historical (or literary) sources?



# MEDIUM

## Machines (software and hardware)

- Digital medium as publication medium with own constraints and opportunities

- Means for operationalising concepts – e.g. algorithms and datasets
  - How to correlate methods in (big) data analytics to historical (or literary) sources?



(Pechenick, Danforth and Dodds 2015)

- OCR errors
- Dominance of scientific literature
- Messy metadata (inaccurate data)
- What does popularity means?



# MEDIUM

## Machines (software and hardware)

- Digital medium as publication medium with own constraints and opportunities
- Means for operationalising concepts
- Technologies within ethical perspective

SWEEEP Kuusakoski, Kent UK

Minimal computing -

<http://www.globaloutlookdh.org/minimal-computing/>



# MEDIUM

## Machines (software and hardware)

- Digital medium as publication medium with own constraints and opportunities
- Means for operationalising concepts
- Technologies within ethical perspective

→ DH akin to techno-sciences and research management-aware (reliance on technical infrastructures and high budget research)

→ DH critical of infrastructure - outdated vertical metaphor?

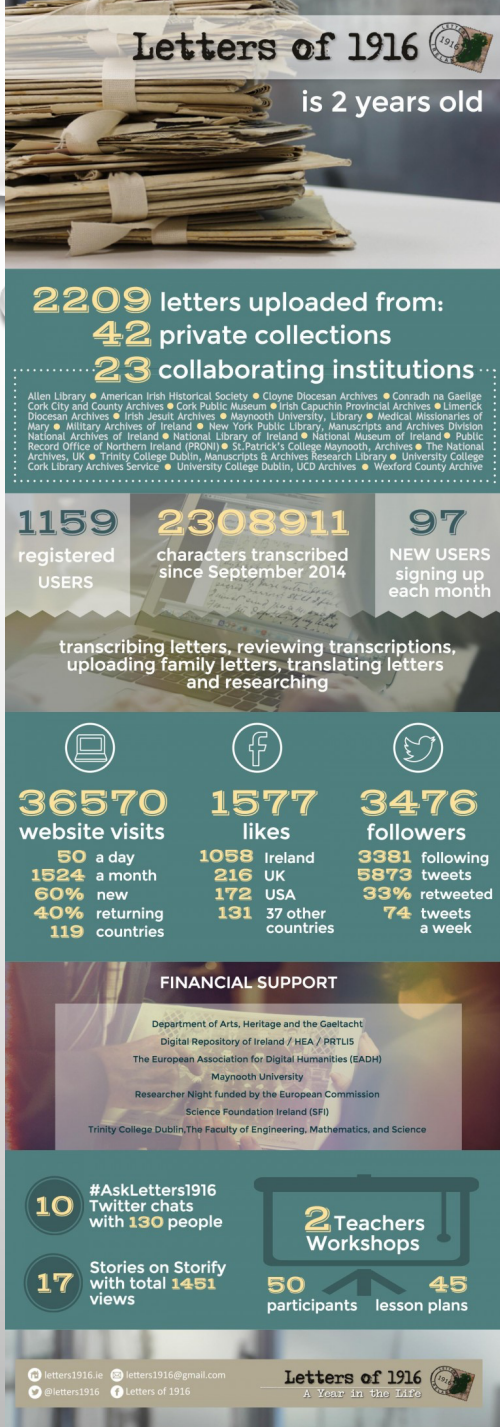
“Within digital humanities, the idea of infrastructure is particularly unhelpful because it encourages a prejudice that digital work is a supporting activity, subsidiary to research and teaching.” (Prescott 2016)

“[...] use technology self-reflexively as part of the very knowledge, and not just instrument, of researching and acting ethically on society” (Liu 2016)



# MEDIUM

## Machines (software and hardware)



→ DH connected to public humanities  
and 'citizen science'

from machines to humane project (McCarty 2012)



# OBSERVERS

## Subjectivity

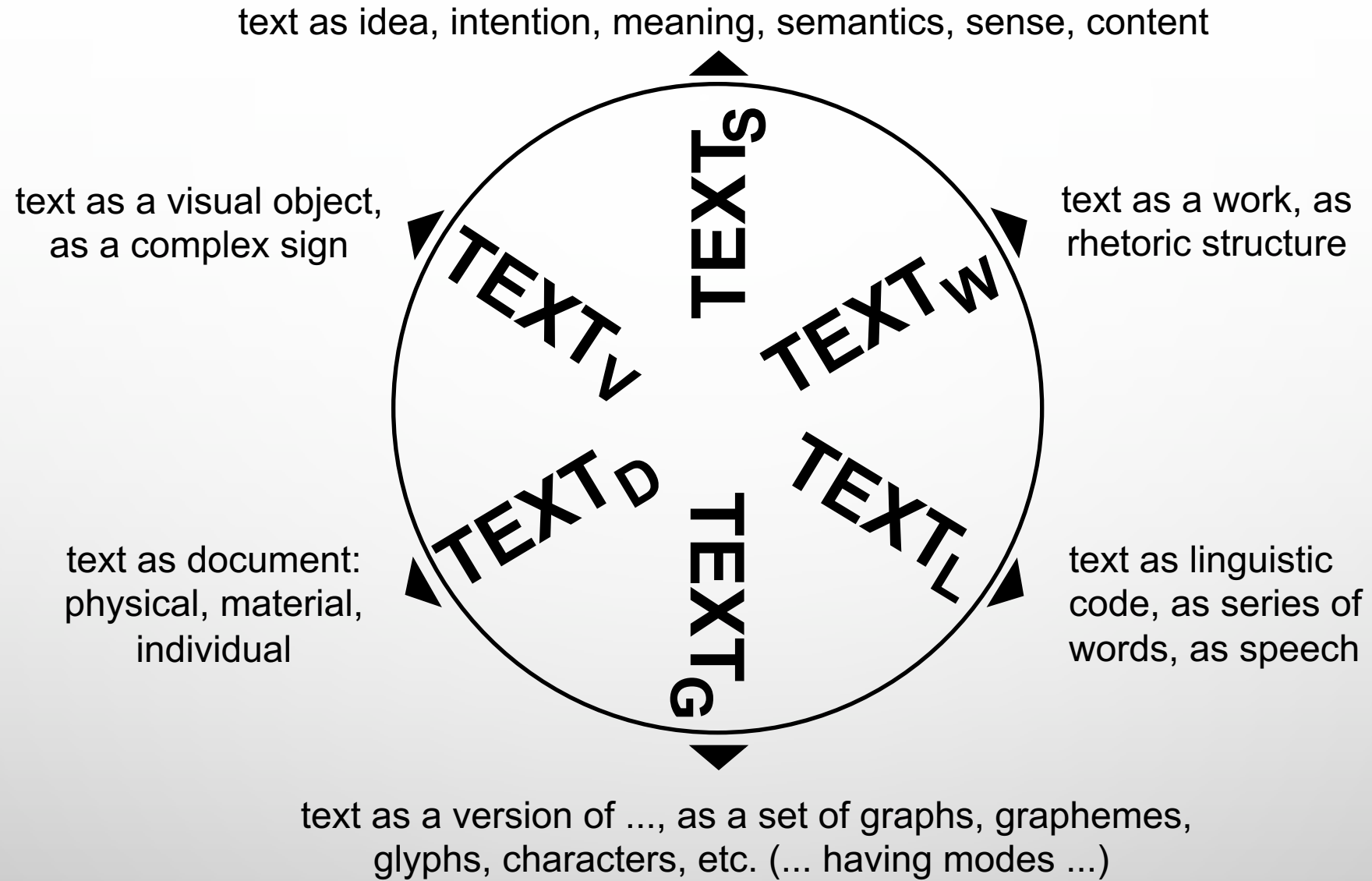
- Evident link between models and our role as observers/creators/interpreters
- Complex boundary between factual observation of the past and its context of interpretation  
→ subjectivity of the humanities  
(Small 2013)



# OBSERVERS → AGENTS

## Agency

- Ourselves and others making intellectual and technical choices/interpreting
  - e.g. in creating/selecting models, establishing units of analysis / pinpointing a theory of objects/texts





# OBSERVERS

## Agency

- Ourselves and others making intellectual and technical choices/interpreting
  - engagement with interpretative agents of the past (engage with meta-modelling)
- DH of the humanities in *long shelf* engagement with literature

(Agency → in the sources)

# OBSERVERS → AGENTS

## Agency → FUTURE

- Planning re-use, documentation, sustainable technologies, community engagement with respect to standards

→ In DH balancing out specificity of objects of study with need for flexible, sustainable and re-usable resources





# CONCLUSIONS

## What we see ...

- Primarily
  - OBJECTS → in detailed and expanded (also distorted) form
  - Lenses → own INSTRUMENTS, tools, media
  - OBSERVERS (ourselves) → interpreters
- Consequently
  - Abstraction, patterns, threads connecting epistemic traditions
  - Other creators, observers and interpreters → in the PAST, PRESENT and FUTURE
  - Power and limits of technology → SOCIAL and ENVIRONMENTAL SUSTAINABILITY and AGENCY



- Archimedes palimpsest project <http://archimedespalimpsest.org>
- Beam, A., J. Bradley, D. Broun, J. . Davies, M. Hammond, M. Pasin (with others), *The People of Medieval Scotland, 1093 – 1314* (Glasgow And London, 2012), <http://www.poms.ac.uk>.
- Bod, R., J. Maat, and T. Weststeijn, eds. *The Making of the Humanities. Vol. I: The Humanities in Early Modern Europe*. Amsterdam: Amsterdam University Press, 2010. Print and Web. <http://oapen.org/download?type=document&docid=429194>
- Balsa Rodriguez, M., M. Agus, F. Bettio, F. Marton And E. Gobbetti. Digital Mont'e Prama: 3D Cultural Heritage presentations in Museums and anywhere. In *Proc. Digital Heritage: 545-552*, September 2015
- Bradley, J., and M. Pasin. "Structuring That Which Cannot Be Structured: A Role For Formal Models In Representing Aspects Of Medieval Scotland", In Matthew Hammond (Ed.), *New Perspectives On Medieval Scotland, 1093-1286*, Woodbridge: the Boydell Press, 2013, pp. 203-214
- Ciula, A. and Lopez, T. Reflecting On A Dual Publication: Henry III Fine Rolls Print And Web. *Literary and Linguistic Computing* 24.2 (2009): 129-141.
- Dunn, S. and M. Schumacher. Explaining Events to Computers: Critical Quantification, Multiplicity and Narratives in Cultural Heritage. *Digital Humanities Quarterly* 10.3 (2016) <http://www.digitalhumanities.org/dhq/vol/10/3/000262/000262.html>
- Elliott, T., G. Bodard, E. Mylonas, S. Stoyanova, C. Tupman, S.Vanderbilt, et al. (2007-2013), *Epidoc Guidelines: Ancient Documents in TEI XML* (Version 8) <http://www.stoa.org/epidoc/gl/latest/>
- GO::DH Minimal computing working group <http://www.globaloutlookdh.org/minimal-computing/>
- The Hespont project <http://hellespont.dainst.org/>
- Henry III Fine Rolls project <http://frh3.org.uk>
- Johnson, C. R., Jr., D.H. Johnson, and W. Liedtke. Canvas Matches in Vermeer: A Case Study in the Computer Analysis of Fabric Supports. *Metropolitan Museum Journal* V. 47 (2012)
- Letters of 1916 project <http://letters1916.maynoothuniversity.ie>
- Liu, A. "Opening remarks." Interrogating Infrastructure'workshop, King's College London, July 2016 <http://liu.english.ucsb.edu/wp-includes/docs/talks/2016kingscollege/opening-remarks.pdf>
- McCarty, W. "The Residue Of Uniqueness." In *Controversies around the Digital Humanities*, Manfred Thaller (ed.), 24-45. *Historical Social Research* 37.3 (2012).
- Hockney, D. *Secret Knowledge: Rediscovering the lost techniques of the Old Masters*. Thames & Hudson, 2006
- Pechenick E.A., Danforth C.M., Dodds P.S. Characterizing the Google Books Corpus: strong limits to inferences of socio-cultural and linguistic evolution. *PLoS ONE* 10.10(2015): E0137041.
- Prescott , A. "Why Infrastructure?" Interrogating Infrastructure'workshop, King's College London, July 2016 <https://medium.com/digital-riffs/why-infrastructure-ccc8f79a3ba8#.3jy6jc16t>
- Sahle, P. "Modeling Transcription." Knowledge Organization and Data Modeling in the Humanities: an ongoing conversation. Workshop at Brown University March 2012. <http://datasymposium.wordpress.com>
- Terras, M. *Digital Images for the Information Professional*. Routledge, 2008.
- Ray Murray, P. Digital Humanities, MA Programme Prospectus, Srishti Institute of Art, Design and Technology <http://srishti.ac.in/programs/pg-program-ma-in-digital-humanities>
- Small, H. *The Value Of The Humanities*. Oxford: Oxford University Press, 2013.
- Tomasek, K., Vogeler, G., Pindl, K., Anderson, C., Orlowska, A., Eide, O. [MEDEA \(Modeling Semantically Enriched Digital Editions Of Accounts\)](#) Panel presented at DH 2016, Krakow, July 2016.

## REFERENCES

# THANK YOU!

Dr ARIANNA CIULA

[ARIANNA.CIULA@ROEHAMPTON.AC.UK](mailto:ARIANNA.CIULA@ROEHAMPTON.AC.UK)

@ARICIULA

Museo Galileo 2428, 1609-10

