





Digitizing the Act of Papyrological Interpretation: Negotiating Spurious Exactitude and Genuine Uncertainty

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Introduction

What do papyrologists do?

- Papyrology is about producing a **transcription** and an **interpretation** of a textual document
- Requires expertise in:
 - Ancient language
 - Latin, Greek, Coptic,...
 - Palaeography
 - Letter shapes and their evolution through time
 - Linguistics
 - Occurrences of words, letters, typical formulae,...
 - Lexical fields, grammar
 - Ancient history & archaeology
 - Context of the artefact




[Youtie:1963,1966] [Terras:2006]
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Introduction

Close up - Vindolanda Tablet 1563



- Complex incisions
- Woodgrain
- Surface discoloration
- Warping
- Cracking
- Noisy image
- Palimpsest
- Long process

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Introduction

Private papyrology: producing an interpretation

- Consensus on the fact that the process:
 - Progressively and continuously builds meaning
 - Accesses and builds knowledge (implicitly and explicitly)
 - Is both iterative and recursive (progression and circularity / self-consistency)

"And so he [the papyrologist] constantly oscillates between the written text and his mental picture of its meaning, altering his view of one or both as his expanding knowledge of them seems to make necessary. Only when they at least cover each other is he able to feel that he has solved his problem." (Youtie, 1973)

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Interpretation Support System (ISS) as a rationale recording tool

- Aim: Record the trajectory of the **continuous thought process** that builds the meaning
- Challenge: identify and capture a series of **discrete steps** that allow to reconstruct the continuous process
- Strategy: **understand** and **model** the **experts' strategies** of papyrological interpretation

In the hard sciences, to describe a continuous signal:

- Establish a model
- Identify control points
- Reconstruct the signal

A cubic Bézier curve
(source: Wikipedia)

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Modelling what papyrologists do into levels of reading

[Terras 2006]

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Tools to assist at the various levels of reading

Artefact Digitization

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Tools to assist at the various levels of reading

Image processing

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Tools to assist at the various levels of reading

Meaning or sense of document

Archaeological or historical context

Physical attributes of the document

Meaning or sense of a phase or group of words

Meaning or sense of a word

Features of a character

Grammar

Possible character

Possible word or morphemic unit

Possible sequence of characters

Knowledge bases, contextual encoding

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Argumentation Theory and Theory of Justification

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Avoiding spurious exactitude?

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Avoiding spurious exactitude?

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Capturing volumetric information with digital photographs

- Experts hold the tablet at eye level in raking light and apply pitch-and-yaw motion to it
- Shadow-stereo principle:
 - The highlight and shadow areas move according to the position of the light
 - Stains stay in place

➤ Yields volumetric information

➤ Imitates expert strategy

Camera

Cross-section of an incision

Corresponding image

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Avoiding spurious exactitude?

Frison tablet.
Original
transcription by
C.W. Vollgraf,
1917 -- "De
tabella
emptonis
aetatis Traiani
nuper in Frisia
reperta"

New
transcription by
A.K. Bowman,
R.S.O. Tomlin,
and K.A. Worp,
2009
JRS -- "Emptio
bovis Frisica:
the 'Frison ox
sale'
reconsidered"

→ Digital
pictures
by Dr. C.
Crowther

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Avoiding spurious exactitude?

Polynomial
Texture
Mapping of the
same tablet

[Siggraph
2001;
Malzbender
et al.]

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Allowing genuine uncertainty?

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Allowing genuine uncertainty?

Expert interpretation strategies

- Kinaesthetic /
palaeographical
 - Drawing
 - Embodiment of the script
 - Visual feedback loop
between mental image of
the text and the actual
text
- Cruciverbalistic /
philological
 - Crossword puzzle solving
 - Script as collection of
symbols
 - Intuitive knowledge of
language and statistical
occurrences of characters

RIT.UT.D QUEM

➤ Predominant strategy closely related to personal skills

➤ Strategies not mutually exclusive!

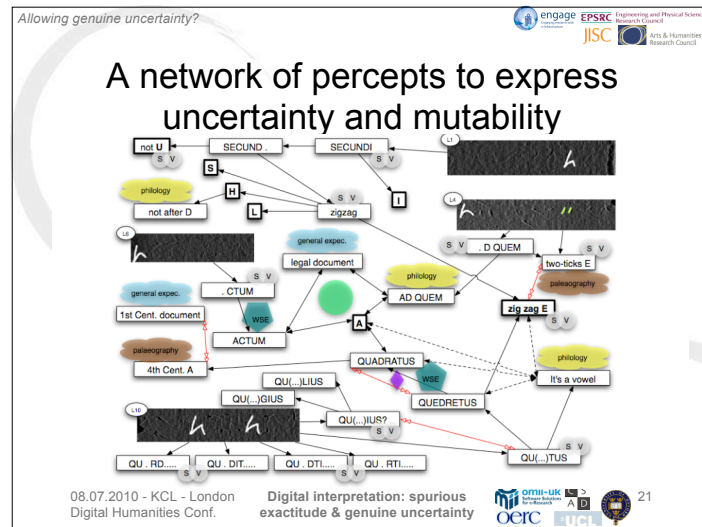
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Allowing genuine uncertainty?

A papyrological crossword

What is this character  ? (although somewhat atypical, the palaeography is that of a 1st century script)

"Clues" (images) and "filled in boxes"

Hypothesis	Supporting evidence
Vowel	After QU
E	• Vowel
	• Read so in 1917
A	• Vowel
	• Makes a known name
L	Read so in 1917
A	Occurs in legal documents
L	Read so in 1917
A	Occurs in legal documents

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Allowing genuine uncertainty?

Where papyrological and epistemological crosswords meet

How good is a person's piece of evidence e wrt a claim p ?

$p1$ = "it's an A"; $e1$ = "QUADRATUS is a name"; $e11$ = "ACTUM in legal doc."

$e2$ = "after QU comes a vowel"; $p2$ = "it's an E"; $e3$ = "it was read as E in 1917"

Its degree of favourableness wrt p	Its degree of security independently from the belief that p	Its degree of comprehensiveness wrt p [Haack 1993]
$e1$ not conclusive but more favourable than $e2$ or $e3$	$e1$ well secure independently from the belief that $p1$ (which is still supported by $e.g., e11$)	$e1$ lacks in comprehensiveness: "1st century palaeography and date but 3rd/4th century A?"

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Allowing genuine uncertainty?

Clash of expectations

ORC 'A'	Frisian tablet 'A'	NRC 'A'
1st cent. AD	29 AD	3rd/4th cent. AD

"It's only a late looking A because we think it's late looking A"

Intentionality vs. serendipity
Expectations & habitus vs. perception & cognition

Mutation of the comprehensiveness criterion: reinforces the justification for reading an A

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Digitization is also interpretation.

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Mimesis as a digitization strategy

- Artefact digitization
 - Pitch-and-yaw in raking light: shadow-stereo principle
 - Takes materiality into account
- Interpretation process digitization
 - Kinaesthetic approach: allow digital drawing
 - Cruciverbalistic approach: allow crossword puzzle solving

Advantages of mimesis:

- Makes obvious that digitization is already interpretation
- Minimizes the overhead for the users embracing the digital tool

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<http://esad.classics.ox.ac.uk>

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Characters *Contradiction* *Mutual support*

Palaeography *Mutability* *Words* *Document*

Interpretation *Philology*

Perception

Features *Phrases*

Explicit *Implicit*



Etsuko Ichikawa: Kokoro InBetween, 2008.
Glass pyrograph on paper, 22 x 43-1/2 inches.
Source (last checked 9th May 2010):
<http://www.davidsongalleries.com/artists/ichikawa/ichikawa.php>

<http://esad.classics.ox.ac.uk>

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