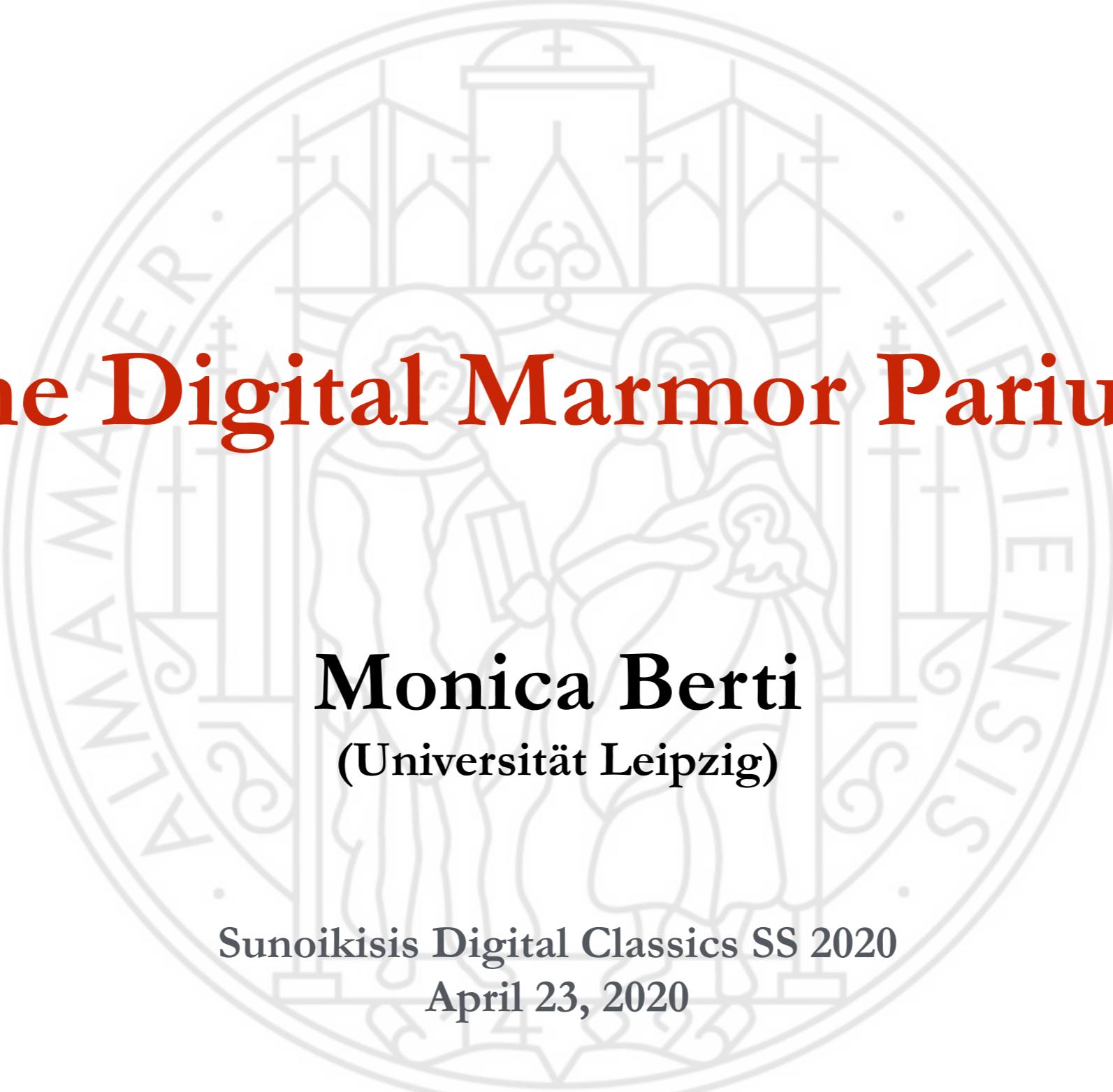


The Digital Marmor Parium



Monica Berti
(Universität Leipzig)

Sunoikisis Digital Classics SS 2020
April 23, 2020

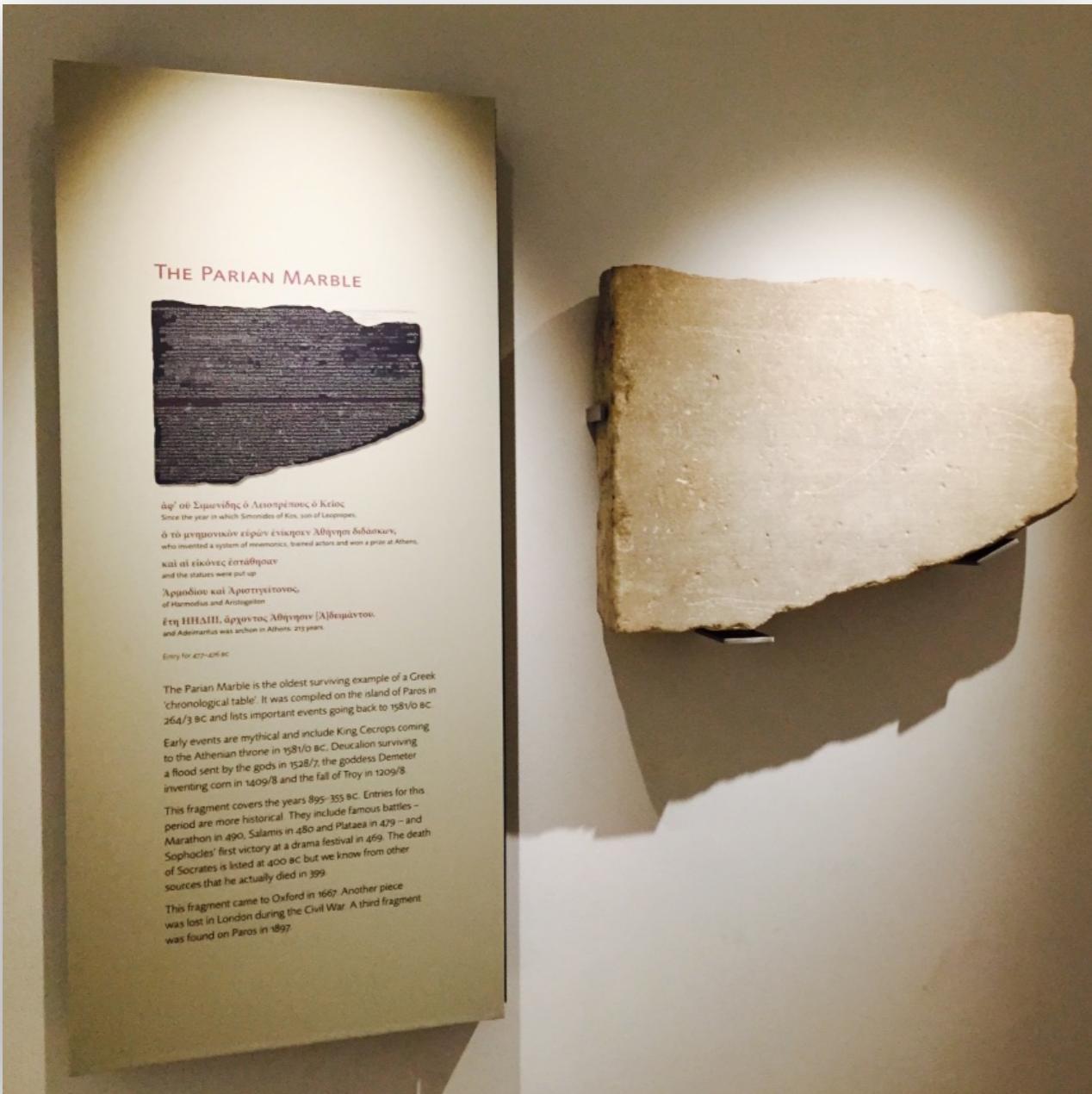
Marmor Parium

- Hellenistic chronicle on marble
- list of events: 1581/80 - 299/98 BC
- Panhellenic history with a focus on Athens
- double chronology:
 - number of years elapsing from 264/63 BC (acrophonic numerals)
 - name of Athenian king or archon
- the author of the text is unknown

Marmor Parium

- the date of composition/publication is unknown
(264/63 *terminus post quem*)
- the ultimate purpose of the document is unknown
- the original location is unknown
- chronological issues:
 - use of different sources based on different lists of archons
 - shift from an exclusive to an inclusive counting

the stone



Fragment A
Oxford, Ashmolean Museum
(2015)

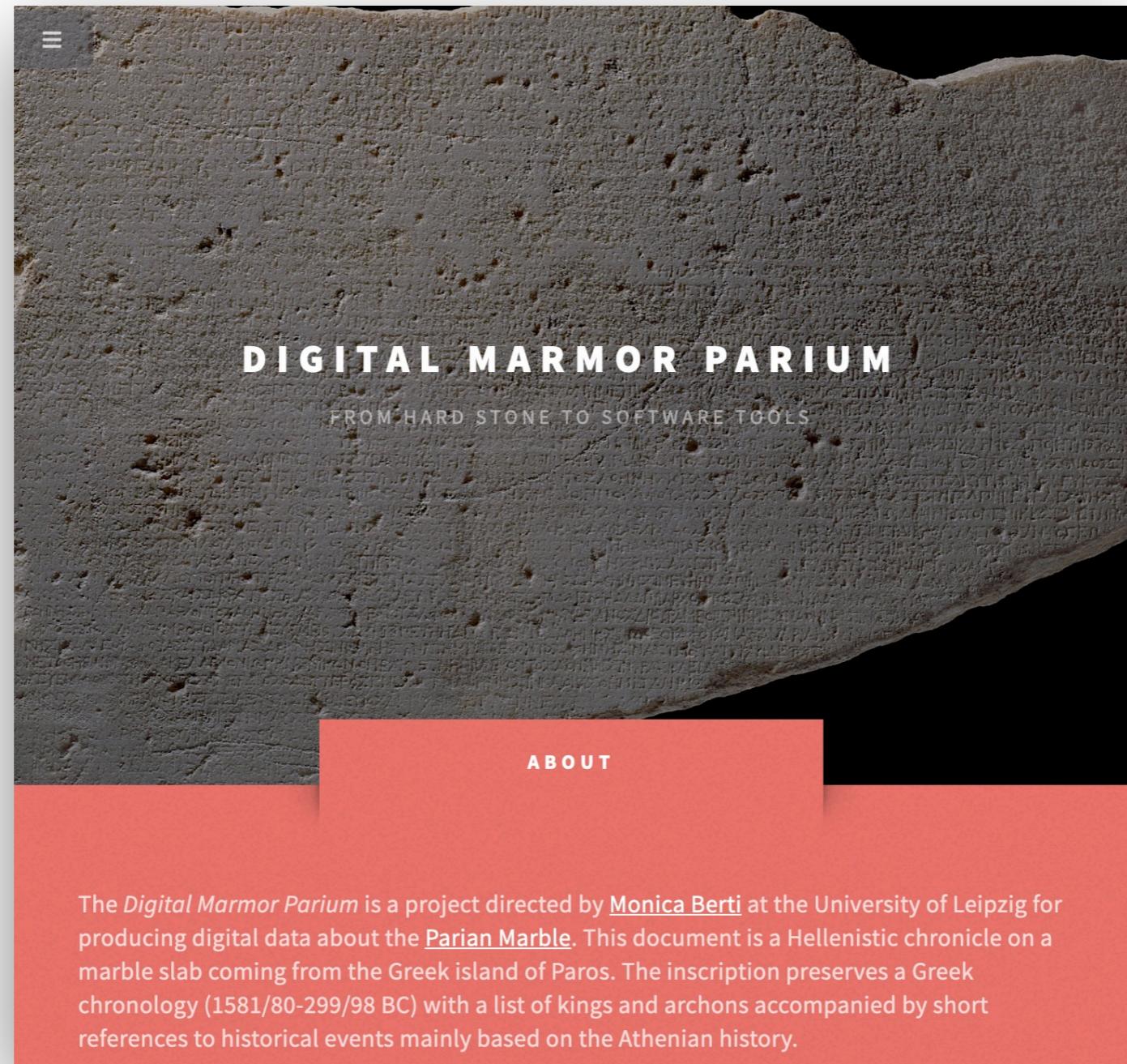


Fragment B
Paros, Archaeological Museum
(2015)

text structure

Fragment	Entries	Athenian kings/archons	Chronology	Events
A(a) lines 1-45	1-29	Cecrops, Cranaos, Amphictyon, Erichthonios, Pandion, Erechtheus, Pandion, Aegeus, Theseus, Menestheus, Demophon, Menestheus, Diognetos	ca. 1581/80 – 907-05	mythological events related to Greek kings, poetry, religion, temple foundations, ...
A(b) lines 46-93	30-80	Pherecles, Aischylos, (681/80) Lysiades, Dropides, Aristocles, Critias the first, Simon, Damasios the second, Comeus, Euthydemos, Harpactides, Lysagoras, Pythocritos, Phainippides the second, Aristeides, Philocrates, Kalliades, Xanthippos, Timosthenes, Adeimantos, Chares Apsephion, Theagenides, Euthippos, Callias the first, Diphilos, Astyphilos, Euctemon, Antigenes, Callias the first, Mikon, Laches, Aristocrates, Pytheus, Callias, Asteios, Phrasicleides, Nausigenes, Cephisodoros, Agathocles, Callistrates	ca. 895-93 – 354	annual archonship, innovations in music and theatre, life of tragedians, comedians and other poets, historical events, ...
B lines 1-34	1-27	Pythodelos, Euainetos, Ctesicles, Nicocrates, Niketos, Aristophon, Euthycrites, Hegesios, Cephisodoros, Philocles, Archippos, Apollodorus, Demogenes, Democleides, Theophrastos, Polemon, Simonides, Hieromnemon, Demetrios, Cairimos, Anaxicrates, Coroibos, Euxenippus, Pherecles, Leostratos, Nicocles, Euctemon	ca. 336/35 – 299/98	historical events of the Hellenistic age, life of poets, city foundations, natural events (eclipses, earthquakes), ...

Digital Marmor Parium



<http://www.digitalmarmorparium.org>



DIGITAL MARMOR PARIUM

character encoding



character encoding

Attic acrophonic numerals

I	1	¶	50
Π	$5 = \pi(\epsilon\nu\tau\varepsilon)$	¤	500
Δ	$10 = \delta(\epsilon\xi\alpha)$	¤¤	5000
H	$100 = h(\epsilon\xi\alpha\tau\omega\eta\upsilon)$	¤¤¤	50,000
X	$1000 = \chi(i\lambda\iota\omega\iota)$		
M	$10,000 = \mu(\u03b9\rho\iota\omega\iota)$		

Marmor Parium

I Π Δ ¶ H ¤ X

MP A1, 3: Ἄφ' οῦ δίκη Ἀθήνησι [ἐγέ]νετο Ἀρει καὶ Ποσειδῶνι
ύπὲρ Ἀλιρρόθιου τοῦ Ποσειδῶνος, καὶ ὁ τόπος ἐκλήθη Ἀρειος
πάγος, ἔτη ΧΗΗΠΔΓIII, βασιλεύοντος Ἀθηνῶν Κρ[ανα]οῦ.

```
<seg type="entry" n="3">ἀφ' οῦ δίκη  
Ἀθήνησι <supplied reason="lost">ἐγέ</supplied>νετο Ἀρει καὶ Ποσειδῶνι  
ύπὲρ Ἀλιρρόθιου τοῦ Ποσειδῶνος, καὶ ὁ τόπος ἐκλήθη <lb n="6"/> Ἀρειος  
Πάγος, ἔτη <date from="-1531" to="-1530" when-custom="1268"  
datingMethod="#magmog_parium"><num type="acrophonic">  
ΧΗΗ&#x10144;Δ&#x10143;III</num></date>, βασιλεύοντος Ἀθηνῶν  
Κρ<supplied reason="lost">ανα</supplied>οῦ.</seg>
```

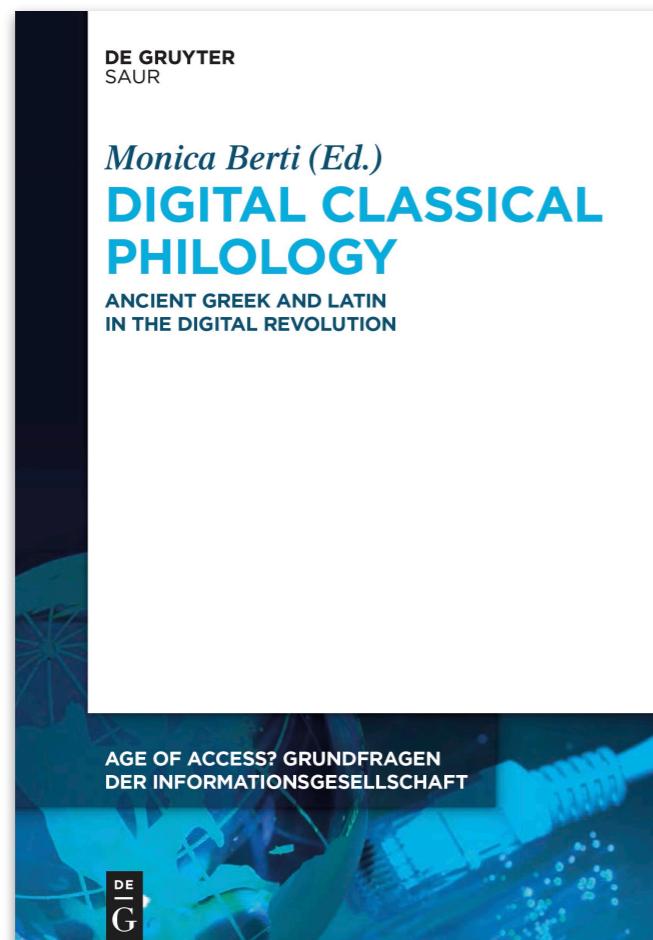
Rotstein 2016, p. 38: “From the time a trial occurred in Athens between Ares and Poseidon over Halirrhothius, Poseidon’s son – hence the place was called Areopagos – 1268 years (= 1531/30 BC), when Cranaus was king of Athens.”

MP A1, 3: Ἄφ' οῦ δίκη Ἀθήνησι [ἐγέ]νετο Ἀρει καὶ Ποσειδῶνι
ύπὲρ Ἀλιρρόθιου τοῦ Ποσειδῶνος, καὶ ὁ τόπος ἐκλήθη Ἀρειος
πάγος, ἔτη ΧΗΗΠΔΓIII, βασιλεύοντος Ἀθηνῶν Κρ[ανα]οῦ.

```
<seg type="entry" n="3">ἀφ' οῦ δίκη  
Ἀθήνησι <supplied reason="lost">ἐγέ</supplied>νετο Ἀρει καὶ Ποσειδῶνι  
ύπὲρ Ἀλιρρόθιου τοῦ Ποσειδῶνος, καὶ ὁ τόπος ἐκλήθη <lb n="6"/> Ἀρειος  
Πάγος, ἔτη <date from="-1531" to="-1530" when-custom="1268"  
datingMethod="#magmog_parium"><num type="acrophonic">  
ΧΗΗ&#x10144;Δ&#x10143;III</num></date>, βασιλεύοντος Ἀθηνῶν  
Κρ<supplied reason="lost">ανα</supplied>οῦ.</seg>
```



Rotstein 2016, p. 38: “From the time a trial occurred in Athens between Ares and Poseidon over Halirrhothius, Poseidon’s son – hence the place was called Areopagos – 1268 years (= 1531/30 BC), when Cranaus was king of Athens.”



<https://doi.org/10.1515/9783110599572>

James K. Tauber

Character Encoding of Classical Languages

Abstract: Underlying any processing and analysis of texts is the need to represent the individual characters that make up those texts. For the first few decades, scholars pioneering digital classical philology had to adopt various workaround for dealing with the various scripts of historical languages on systems that were never intended for anything but English. The Unicode Standard addresses many of the issues with character encoding across the world's writing systems, including those used by historical languages, but its practical use in digital classical philology is not without challenges. This chapter will start with a conceptual overview of character coding systems and the Unicode Standard in particular but will discuss practical issues relating to the input, interchange, processing and display of classical texts. As well as providing guidelines for interoperability in text representation, various aspects of text processing at the character level will be covered including normalisation, search, regular expressions, collation, and alignment.

Introduction

The representation of texts electronically must be grounded in the representation of individual characters in those texts and it is for this reason that character encoding is a foundational part of digital philology.

In this chapter we will look at the character encoding of classical texts with an emphasis on Unicode. I will provide a conceptual introduction and brief history to illustrate the development of those concepts. To avoid being too abstract, however, I will give examples relevant to Ancient Greek as well as demonstrate certain processing characteristics of Unicode via snippets of Python. I include discussion of things to watch out for and common pitfalls.

Preliminaries and history

The idea of encoding the letters of the alphabet using combinations of a much smaller set of symbols goes back centuries. Francis Bacon developed a secret

James K. Tauber, Eldarion



EpiDoc/XML encoding



EpiDoc/XML encoding

MP A2, 48: ἀφ' οὗ ἡ ἐμ Μαραθῶνι μάχη ἐγένετο Ἀθηναίοις πρὸς τοὺς Πέρσας Ἀρ[ταφ]έ[ρνην τε τὸ]ν Δαρείου ἀδελφι[δοῦν κα]ὶ [Δᾶ]τιν στρατηγόν, ἦν ἐνίκων Ἀθηναῖοι, ἔτη ΗΗΔΔΓΙΙ, ἀρχοντος Ἀθήνησιν τ[ο]ῦ δευτέρου [Φ]α[ι]ν[ι]π[πίδ]ον· ἦι ἐν μάχῃ συνηγωνίσατο Αἰσχύλος ὁ ποιητής, | [ἐ[τ]ῶ[ν] ὅν ΔΔΔΓ

Rotstein 2016, p. 44: “From the time the battle in Marathon occurred, the Athenians (fighting) against the Persians and Ar[taph]e[rnes], Darius’ neph[ew, an]d [Da]tis the commander, which the Athenians won, 227 years (= 490/90 BC), when [Ph]a[i]n[i]p[pid]es t[h]e second was archon in Athens. In this battle fought Aeschylus the poet, being 35 years of age.”



EpiDoc/XML encoding

MP A2, 48: **ἀφ' οὗ** ἡ ἐμ Μαραθῶνι μάχη ἐγένετο Ἀθηναίοις πρὸς τοὺς Πέρσας Ἀρ[ταφ]έ[ρνην τε τὸ]ν Δαρείου ἀδελφι[δοῦν κα]ὶ [Δᾶ]τιν στρατηγόν, ἦν ἐνίκων Ἀθηναῖοι, ἔτη ΗΗΔΔΓII, ἀρχοντος Ἀθήνησιν τ[ο]ῦ δευτέρου [Φ]α[ι]ν[ι]π[πίδ]ον· ἦι ἐν μάχῃ συνηγωνίσατο Αἰσχύλος ὁ ποιητής, | [ἐ[τ]ῶ[ν] ὅν ΔΔΔΓ

- **starting point**
- number of years elapsing from 264/63 (227 = 490/89)
- name of the Athenian archon
- age of Aeschylus when he fought at Marathon (35)



EpiDoc/XML encoding

MP A2, 48: ἀφ' οὗ ἡ ἐμ Μαραθῶνι μάχη ἐγένετο Ἀθηναίοις πρὸς τοὺς Πέρσας Ἀρ[ταφ]έ[ρνην τε τὸ]ν Δαρείου ἀδελφι[δοῦν κα]ὶ [Δᾶ]τιν στρατηγόν, ἦν ἐνίκων Ἀθηναῖοι, **ἐτη ΗΗΔΔΓII**, ἀρχοντος Ἀθήνησιν τοῦ δευτέρου [Φ]α[ι]ν[ι]π[πίδ]ον· ἦι ἐν μάχῃ συνηγωνίσατο Αἰσχύλος ὁ ποιητής, | [ἐ[τ]ῶ[ν] ὅν ΔΔΔΓ

- starting point
- **number of years elapsing from 264/63 (227 = 490/89)**
- name of the Athenian archon
- age of Aeschylus when he fought at Marathon (35)



EpiDoc/XML encoding

MP A2, 48: ἀφ' οὗ ἡ ἐμ Μαραθῶνι μάχη ἐγένετο Ἀθηναίοις πρὸς τοὺς Πέρσας Ἀρ[ταφ]έ[ρνην τε τὸ]ν Δαρείου ἀδελφι[δοῦν κα]ὶ [Δᾶ]τιν στρατηγόν, ἦν ἐνίκων Ἀθηναῖοι, ἔτη ΗΗΔΔΓΙΙ, ἄρχοντος Ἀθήνησιν τοῦ δευτέρου [Φ]α[ι]ν[ι]π[πίδ]ον· ἦι ἐν μάχῃ συνηγωνίσατο Αἰσχύλος ὁ ποιητής, | [ἐ[τ]ῶ[ν] ὅν ΔΔΔΓ

- starting point
- number of years elapsing from 264/63 ($227 = 490/89$)
- **name of the Athenian archon**
- age of Aeschylus when he fought at Marathon (35)



EpiDoc/XML encoding

MP A2, 48: ἀφ' οὗ ἡ ἐμ Μαραθῶνι μάχη ἐγένετο Ἀθηναίοις πρὸς τοὺς Πέρσας Ἀρ[ταφ]έ[ρνην τε τὸ]ν Δαρείου ἀδελφι[δοῦν κα]ὶ [Δᾶ]τιν στρατηγόν, ἦν ἐνίκων Ἀθηναῖοι, ἔτη ΗΗΔΔΓΙΙ, ἀρχοντος Ἀθήνησιν τ[ο]ῦ δευτέρου [Φ]α[ι]ν[ι]π[πίδ]ον· ἦι ἐν μάχῃ συνηγωνίσατο **Αἰσχύλος** ὁ ποιητής, | [ξ[τ]ῶ[ν] ὅν ΔΔΔΓ

- starting point
- number of years elapsing from 264/63 (227 = 490/89)
- name of the Athenian archon
- **age of Aeschylus when fighting at Marathon (35)**

<seg type="entry" n="48">ἀφ' οὐ δὲ ἐμ Μαραθῶνι μάχη ἐγένετο Ἀθηναίοις πρὸς τοὺς Πέρσας Ἄρ<supplied reason="lost">ταφ</supplied>έ<supplied reason="lost">ρνην τε τὸ</supplied>ν Δαρείου ἀδελφι<lb n="63"/><supplied reason="lost">δοῦν κα</supplied>ὶ <supplied reason="lost">Δᾶ</supplied>><add place="overstrike">τ<supplied reason="lost">ι</supplied>ν στρατηγόν, ἦν ἐνίκων</add> Ἀθηναῖοι, ἔτη <date from="-0490" to="-0489" when-custom="227" datingMethod="#magmog_pargium"><num type="acrophonic">ΗΗΔΔ𐅃II;</num></date>, ἄρχοντος Ἀθήνησιν τ<supplied reason="lost">ο</supplied>ῦ δευτέρου <supplied reason="lost">Φ</supplied>α<supplied reason="lost">ι</supplied>ν<supplied reason="lost">ι</supplied>π<supplied reason="lost">πίδ</supplied>ου· ἦν ἐν μάχῃ συνηγωνίσατο Αἰσχύλος ὁ ποιητής, <lb n="64"/> ἔτῶν ὧν <date type="age" dur="P35Y"><num type="acrophonic">ΔΔΔ𐅃</num></date>. </seg>



- entry for each event

```
<seg type="entry" n="48">. . .</seg>
```



• personal names

Ἄρ[ταφ]έ[ρνην τε τὸ]ν Δαρείου ἀδελ[φ]ι|[δοῦν

```
<persName><name>Ἄρ<supplied reason="lost">ταφ</supplied><supplied reason="lost">έ<supplied reason="lost">ρνην</supplied></name><supplied reason="lost">τε τὸ</supplied>ν<persName><name>Δαρείου</name></persName> ἀδελ<supplied reason="lost">φ</supplied>ι<lb n="63" break="no"><supplied reason="lost">δοῦν</supplied></persName>
```



• personal names

Ἄρ[ταφ]έ[ρνην τε τὸ]ν Δαρείου ἀδελ[φ]ι|[δοῦν

```
<persName><name>Ἄρ<supplied reason="lost">ταφ</supplied><supplied reason="lost">έ<supplied reason="lost">ρνην</supplied></name><supplied reason="lost">τε τὸ</supplied>ν<persName><name>Δαρείου</name></persName> ἀδελ<supplied reason="lost">φ</supplied>ι<lb n="63" break="no"><supplied reason="lost">δοῦν</supplied></persName>
```

family relationship: SNAP ontology
<http://snap.dighum.kcl.ac.uk/ontology/>

<http://www.stoa.org/epidoc/gl/latest/idx-persnames.html>

Standards for Networking Ancient Prosopographies

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- [OWLDocs](#)

Visualisations of the Ontology:

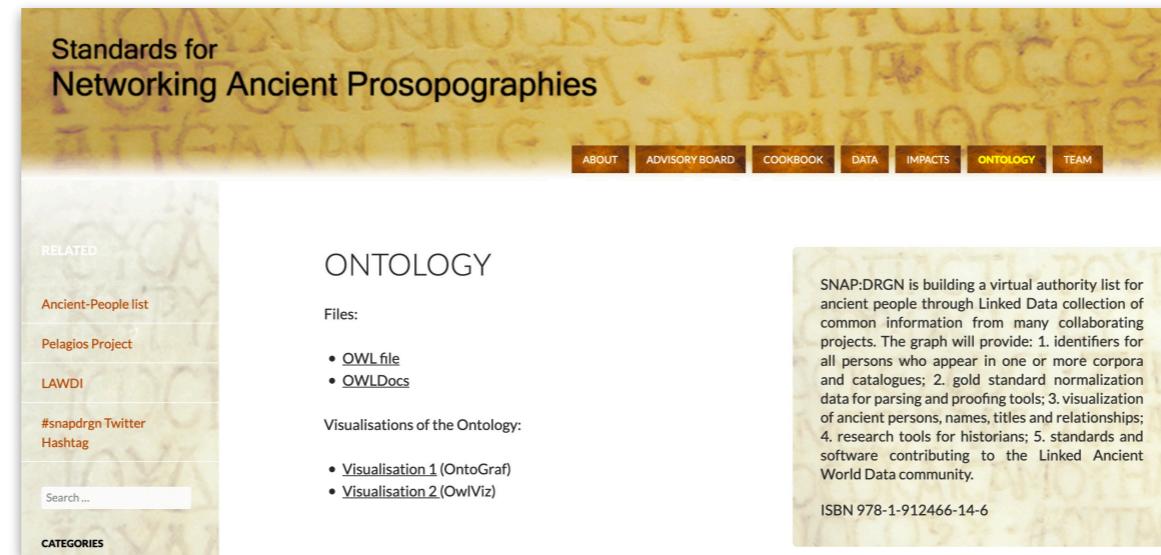
- [Visualisation 1 \(OntoGraf\)](#)
- [Visualisation 2 \(OwlViz\)](#)

SNAP:DRGN is building a virtual authority list for ancient people through Linked Data collection of common information from many collaborating projects. The graph will provide: 1. identifiers for all persons who appear in one or more corpora and catalogues; 2. gold standard normalization data for parsing and proofing tools; 3. visualization of ancient persons, names, titles and relationships; 4. research tools for historians; 5. standards and software contributing to the Linked Ancient World Data community.

ISBN 978-1-912466-14-6

<https://snapdrgn.net/ontology>

<https://dh2016.adho.org/abstracts/262>



- other examples from the DMP
 - Τριπτολέμου τοῦ Κελεοῦ καὶ Νεαίρας (l. 24 - ep. 12) – name of the father and the mother
 - Κριτίου τοῦ προτέρου (l. 52 - ep. 36) – how do we encode τοῦ προτέρου?
 - τῶν πεντήκοντα Δαναίδων (l. 14 - ep. 9) – collective nouns

<https://snapdrgn.net/ontology>

<https://dh2016.adho.org/abstracts/262>



- personal names

ἄρχοντος Ἀθήνησιν [τοῦ] δευτέρου [Φα]ιν[ί]π[που]

ἄρχοντος <placeName>Ἀθήνησιν</placeName><supplied reason="lost">τοῦ</supplied> δευτέρου <persName><name><supplied reason="lost">Φα</supplied>ιν<supplied reason="lost">ί</supplied>π<supplied reason="lost">που</supplied></name></persName>

chronology expressed by the archonship: <date> ... </date>

<http://www.stoa.org/epidoc/gl/latest/idx-datesage.html>

<http://www.stoa.org/epidoc/gl/latest/idx-persnames.html>



- place names

<placeName>Μαραθῶνι</placeName>



Pleiades ID

<https://pleiades.stoa.org>



- dates and other chronological data

(227 = 490/89)

ἔτη ΗΗΔΔΓΙΙ

```
<date from="-0490" to="-0489" when-custom="227"
datingMethod="#marmor_parium"> <num
type="acrophonic">ΗΗΔΔΓΙΙ</num></date>
```

(35 years of age)

[ε][τ]ῶν[ν] ὅν ΔΔΔΓ

```
<date type="age" dur="P35Y">
<num type="acrophonic">ΔΔΔΓ</num></date>
```



- dates and other chronological data

(227 = 490/89)

ἔτη ΗΗΔΔΓΙΙ

```
<date from="-0490" to="-0489" when-custom="227"
datingMethod="#marmor_parium"> <num
type="acrophonic">ΗΗΔΔ&#x10143;ΙΙ</num></date>
```

(35 years of age)

[ε][τ]ῶν νῦν ΔΔΔΓ

```
<date type="age" dur="P35Y"><num
type="acrophonic">ΔΔΔ&#x10143;</num></date>
```



- dates and other chronological data

office span
(21st year of kingship)

31 ἀφ' οὗ Ἀρχίας Εὐαγήτου δέκατος ὧν ἀπὸ Τημένου ἐκ
Κορίνθου ἥγαγε τὴν ἀποικίαν [καὶ ἔκτισε] Συρακού[σσας,
ἔτη — — —,] [.. βασι]λεύ[ον]τος Ἀθηνῶν Αἰσχύλου, ἔτους
είκοστοῦ καὶ ἑνός

βασιλεύοντος Ἀθηνῶν Αἰσχύλου, `<date type="office-span" dur="P21Y">`ἔτους είκοστοῦ καὶ ἑνός`</date>`