Integrating Digital Papyrology

Final Report

(Narrative)

Advanced Papyrological Information System (APIS)
Duke Databank of Documentary Papyri (DDbDP)
Heidelberger Gesamtverzeichnis der griechischen
Papyrusurkunden Ägyptens (HGV)

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Objectives

The primary thrust of the Integrating Digital Papyrology project were twofold:
standards and access. They may be summarized as follows: (a) to convert the
DDbDP from its outdated Perseus-based SGML / beta-code encoding to Unicode
EpiDoc TEI XML, (b) to devise a robust and repeatable process for converting HGV
[description] metadata and translations to the same encoding standards, (c) to
merge this content, metadata and texts, (d) to map the merged DDBDP-HGV data to
corresponding APIS records, both metadata and images, and (e) to build on the
prototype Papyrological Navigator (PN) a first-generation user interface supporting
searching of Greek texts, translations, and metadata, and browsing and display of
different aggregations of the mapped material.

We achieved those goals with impressive results. To illustrate the project's
accomplishments from the user-community's perspective, we begin here, with a few
annotated screen-shots of the new system, and proceed from there to a technical
description of the work conducted, and of what makes the following images possible.

Papyrological Navigator: A User's Perspective

Browsing for Known Published Texts

The user who wants to locate a known text, navigates to the simple and intuitive
browser and selects the desired item
[http://apptest.cul.columbia.edu:8082/navigator/portal/default-page.psml]:
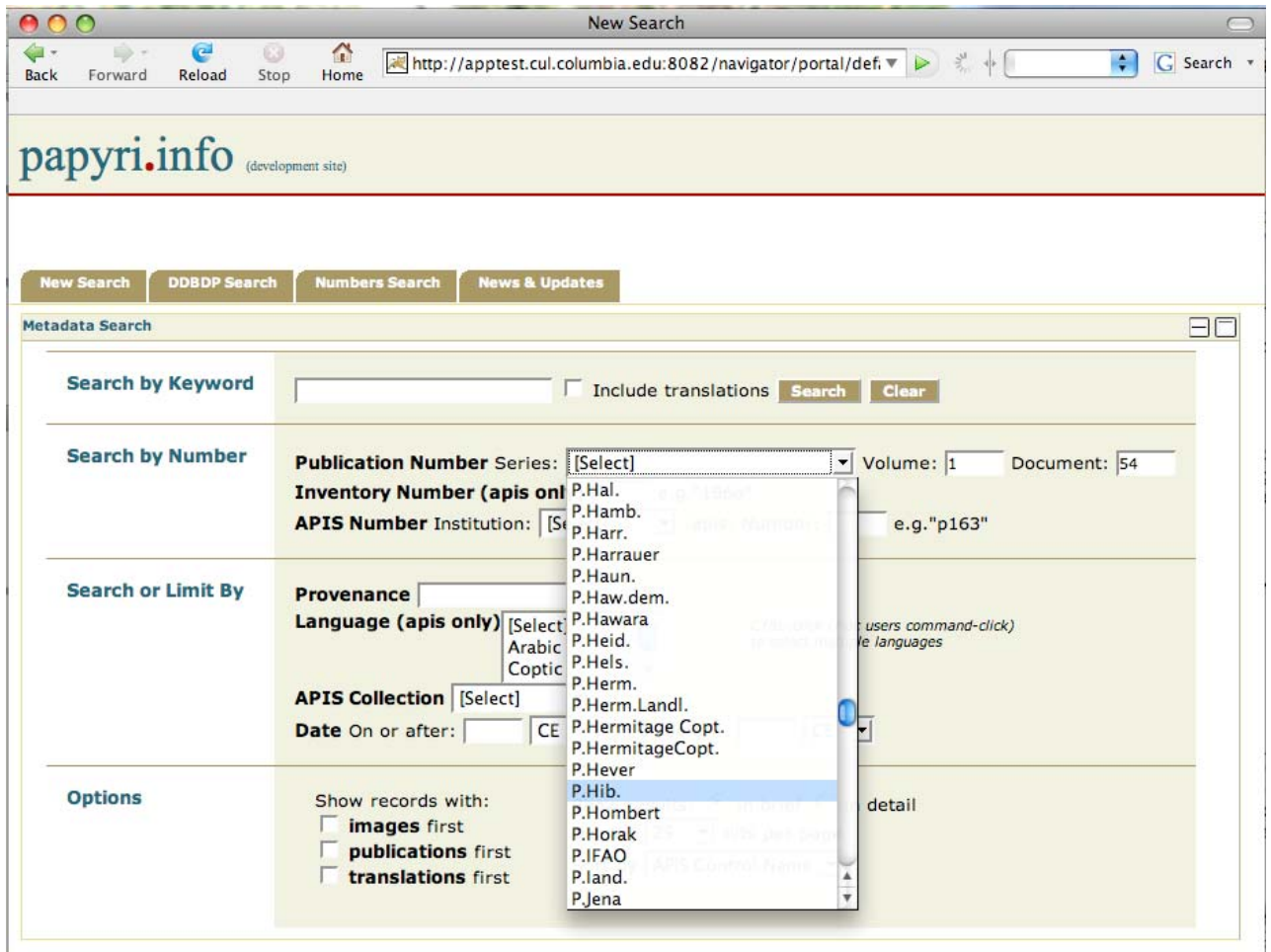
Possible matches are returned, from which the user may navigate to the default view of the object:

The known default view of the desired item (here stitched together from two screen shots), in this case *P.Hib.* I 54, then appears. The default PN view of the object tiles on the same page APIS metadata at top left, HGV metadata beside it to the right, with DDBDP text and APIS translation side-by-side below, and APIS translation separately below. Tabs take the user to different views of the same data.

Back | Forward | Reload | Stop | Home | http://apptest.cul.columbia.edu:8082/navigator/portal ▼ | ▷ | | G Search ▼

papyri.info (development site)

P.Hib. 1 54

New Search | DDBDP Search | Numbers Search | **Metadata Overview** | Metadata Details | Text & Translation | News & Updates

Primary Metadata Document [source] [navigate]

Metadata for toronto.apis.12(xml)

Title	Letter, ca. 245 B.C.
Publication	Chrest.Wilck. 477
Summary	Demophon writes to Ptolemaios requesting musicians, instruments, and food for a festival; he also requests return of a fugitive slave.
Inv. Id	CaOTU:P.Hib. I 54
Physical Desc.	1 papyrus; 24.5 x 7 cm.
Provenance	Hibeh ; Mummy A (probably A 9)
Language	grc-Grek
Notes (General)	32 lines, on recto along the fibers. ; Hibeh ; Margins: left, 1 cm.; top, 2 cm.; bottom, 2.2 cm.; right, .2 cm. ; P. Hib. I 51-62, 167-168. ; Recto and verso published. ; Regular cursive. ; Verso painted; address written against the fibers.
Subject(s)	Oxyrhynchites ; Festivals; Slaves ; Zenobios ; Demophon ; Ptolemaios (cf. P.Hib. I 51-62 and 167-168) ; Aristion ; Petous ; Semphtheus
Associated Name(s)	Semphtheus
	Aristion
	Ptolemaios (cf. P.Hib. I 51-62 and 167-168)
	Demophon
	Zenobios
	Petous
Date	245 BCE

Supplemental Metadata [source] [navigate]

Metadata for P.Hib. 1 54(xml)

Title	Letter of Demophon to Ptolemaeus
Publication Number	Chrest.Wilck. 477
	P.Hib. I 54
	C.Ptol.Sklav. I 84
	C.Pap.Hengstl 93
	Sel.Pap. I 95
	Witkowski, Epistulae privatae 21
Post-Concordance BL Entries	BL IX, pages 108
Provenance	oxyrhynchites ; egypt
Material	Papyri
Date	ca. 245 v.Chr.
Print Illustrations	Deissmann, Licht vom Osten, Abb. 23, S. 130
Images on the Web	Abbildung im Internet

Duke Databank of Documentary Papyri Text [source] [navigate]

DDbDP Full Text: p.hib.1.54

c245BC Hibeh
[Reprinted from: chr.wilck.477] WChr477

r

Δημοφῶν Πτολε-
μαίωι χαίρειν. ἀπό[σ]-
τειλον ἡμῖν ἐκ παν-
τὸς τρόπου τὸν αὐ-
5 λητὴν Πετοῦν ἔχοντ[α]
τούς τε Φρυγίους αὐ-
λ[ο]ὺς καὶ τοὺς λοιπούς, κ[αὶ]
ἐάν τι δέηι ἀναλῶσαι choice01
δός, παρὰ δὲ ἡμ[ῶ]ν κομι-

Images on the Web

Viewer — 6.9%

Translation [source] [navigate]

toronto.apis.12 HGV Translation (English)

Recto: Demophon to Ptolemaios, greetings. By all means send me the flute-player Petous with both the Phrygian and other flutes; and if any expenditure is necessary, pay it and you will be reimbursed by me. Send me also Zenobius the effeminate dancer with the drum and cymbals and castanets, for the women want him for the sacrifice; and let him be dressed as well as possible. Get the kid from Aristion and send it to me. And you have arrested the slave, hand him over to Semphtheus to bring to me. Send me also as many cheeses as you can, empty jars, vegetables of every sort, and whatever delicacies you have. Farewell. Put them on board with the policemen who will help to bring the boat along. Verso: To Ptolemaios

zotero

Below we see a snippet of the default PN view of BGU I 100, for which PN knows a different, and slightly thinner, array of metadata (the "Supplemental Metadata" portlet is in this case incorrectly labeled; this is a known bug).

papyri.info (development site)

BGU 1 100

| New Search | DDBDP Search | Numbers Search | Metadata Overview | Metadata Details | Text & Translation | News & Updates |

Primary Metadata Document [source] [navigate]

Metadata for BGU 1 100(xml)

HGV

Title keiner
Publication BGU I 100
Provenance arsinoites ; egypt
Language grc-Grek
Material Papyri
Subject(s) Vertrag ; Kauf ; Kamel
Date 3. Jan. 159

Images on the Web

Images for BGU 1 100

Abbildung im Internet

Translation [source] [navigate]

BGU 1 100 HGV Translation (English)

Komon, son of Mousaios, the son of Herakleitos to Pekysis, son of Horos, greetings. I acknowledge that I have sold to you a female camel with its second change of teeth, reddish, branded on its right jaw, , and I have received the price agreed upon of seven hundred and eighty and . Year twenty two of Antoninus Caesar, the lord, Tybi 8.

Supplemental Metadata [source] [navigate]

No related metadata available for oai:papyri.info:identifiers:hgv:BGU:1:100 in other data sources.

HGV

Duke Databank of Documentary Papyri Text [source] [navigate]

DDbDP Full Text: bgu.1.100

AD159 Arsinoite

DDb

Κόμων Μουσαίου τοῦ Ἡρακλείτου
Πεκύσι Ὥρου χαίρειν. ὁμολογῶ πε-
πρακέναι^{subst01} σοι κάμηλον θήλειαν δ-
ευτερόβολον πυρρὰν^{app01} κεχαραγμένο[ν]
5 δεξιῷ, σιαγόνι^{choice03} ταύτην τοιαύτην^{choice04}
ἀναπόριφον, καὶ ἀπέχω τὴν συ[ν]-
πεφωνημένην τιμὴν^{choice05} ἀργυρ[ί]-
ου δραχμὰς ἑπτακοσίας^{choice06} ὀγδοήκο[ν]-
τα καὶ βεβαιώσω πάσῃ βεβαιώσει^{choice07} .

The primary metadata is furnished by HGV, as is the translation. But the papyrus comes from the Berlin collection, which is not an APIS-member, so that the PN cannot (yet) display an image directly in the image portlet; but HGV metadata include a link to an image hosted by the owning institution, so that the PN is able to present a link out to a digital image of the papyrus, to the left of the text, where the user expects to find locally hosted APIS images. If the user selects the "Text & Translation" tab, the PN presents text and bilingual HGV translations side-by-side, including the HGV mouseover commentaries (the redundant presentation of translations in two different portlets is a known bug):

BGU 1 100

Translation [source] [navigate]

APIS Translation (English) not available for BGU 1 100.

HGV Translation [source] [navigate]

bgu.1.100
AD159 Arsinoite

German translation

[1] Komôn, Sohn des Mûsaios, des Sohnes des Hêrakleitos, grüßt Pekysis, Sohn des Hôros. [2] Ich bestätige, daß ich Dir verkauft habe ein Kamel – weiblich, nach dem zweiten Zahnwechsel, rötlich, markiert an der rechten Kinnlade –, als so, wie es (jetzt) beschaffen ist, nicht zurückzugeben, [6] und ich habe erhalten den vereinbarten Kaufpreis in Höhe von siebenhundertneunzig Silberdrachmen, [9] und ich werde die Garantie in je[...]
[10] Im zweiundzwanzigsten Jahr des Antoninus Caesar, [...]

(DK)

English translation

[1] Komon, son of Mousaios, the son of Herakleitos to Pe[...] greetings. [2] I acknowledge that I have sold to you a fe[...] second change of teeth, reddish, branded on its right jaw, on the spot, just as it is, unreturnable, [6] and I have received the price agreed upon of seven hundred and eighty silver drachmas [9] and I shall guarantee with every guarantee.
[10] Year twenty two of Antoninus Caesar, the lord, Tybi 8.

(JMSC)

Duke Databank of Documentary Papyri Text [source] [navigate]

DDbDP Full Text: bgu.1.100
AD159 Arsinoite

Κόμων Μουσαίου τοῦ Ἡρακλείτου Πεκύσι Ὥρου χαίρειν. ὁμολογῶ πε-
πρακέναι^{subst01} σοι κάμηλον θήλειαν δ-
ευτερόβολον πυρρὰν^{app01} κεχαραγμένο[ν]
5 δεξιῷ, σιαγόνι^{choice03} ταύτην τοιαύτην^{choice04} ἀναπόριφον, καὶ ἀπέχω τὴν συ[ν]-
πεφωνημένην τιμὴν^{choice05} ἀργυρ[ί]-
[ο]υ δραχμὰς ἑπτακοσίας^{choice06} ὀγδοήκο[ν]-
[τ]α καὶ βεβαιώσω πάσῃ βεβαιώσει^{choice07}.
[(ἔτους)] δευτέρου καὶ εἰκοστοῦ
[Ἀ]ντωνίνου Καίσαρος τοῦ κυρίου
[Τ]ῦβι η.

Apparatus

subst01: 2. corr. from πεπρακεν 【αι】 : πεπρακεν\ε/ pap.
app01: 4. BL 7.10: φυρᾷ Original ed. : φυρα pap.
choice03: 5. συαγονι pap.
choice04: 5. τυαυτην pap.
choice05: 7. τειμην pap.
choice06: 8. εψλα/ακοσιας pap.
choice07: 9. βαιβεωσι pap.

German translation

[1] Komôn, Sohn des Mûsaios, des Sohnes des Hêrakleitos, grüßt Pekysis, Sohn des Hôros. [2] Ich bestätige, daß ich Dir verkauft habe ein Kamel – weiblich, nach dem zweiten Zahnwechsel, rötlich, markiert an der rechten Kinnlade –, als so, wie es (jetzt) beschaffen ist, nicht zurückzugeben, [6] und ich habe erhalten den vereinbarten Kaufpreis in Höhe von siebenhundertneunzig Silberdrachmen, [9] und ich werde die Garantie in jeder Form übernehmen.
[10] Im zweiundzwanzigsten Jahr des Antoninus Caesar, des Herren, am 8. Tybi.

(DK)

English translation

[1] Komon, son of Mousaios, the son of Herakleitos to Pekysis, son of Horos, greetings. [2] I acknowledge that I have sold to you a female camel with its second change of teeth, reddish, branded on its right jaw, on the spot, just as it is, unreturnable, [6] and I have received the price agreed upon of seven hundred and eighty silver drachmas [9] and I shall guarantee with every guarantee.
[10] Year twenty two of Antoninus Caesar, the lord, Tybi 8.

(JMSC)

The PN offers a simple process for users to browse to a given object and display an aggregation of all related information from DDbDP, HGV, and APIS, in effect allowing the user to control data or metadata from any one source against the rest. Moreover, the FSI image viewer, embedded in the default view of all texts for which a local APIS image is known, allows the user to control text against image with extraordinary ease and precision. So, for example, the user who has doubts about the reading of the name Οὐενᾶφρις at *P.Col*. VII 133.16 will simply navigate to the default view:

P.Col. 7 133

Primary Metadata Document [source] [navigate]

Metadata for columbia.apis.p171(xml)

Title	No title assigned [between 325 and 350 AD]
Publication	P.Col. VII 133
Summary	Account of grain; the statement of the purpose is not preserved
Inv. Id	NNC:Col.inv. 181 (34)
Physical Desc.	1papyrus ; 9.6 x 27.5 cm
Provenance	Belonging to the Karanis Archives of the early Byzantine period ; Purchased by Columbia University from Mr. Blanchard through H.I. Bell in 1924; no. 34 in Bell's inventory
Language	grc-Grek
Notes (General)	Proficient, medium-sized hand ; Written along the fibers with 20 lines; the back is blank; the surface is badly rubbed
Subject(s)	Account
Date	325 CE - 350 CE

Supplemental Metadata [source] [navigate]

Metadata for P.Col. 7 133(xml)
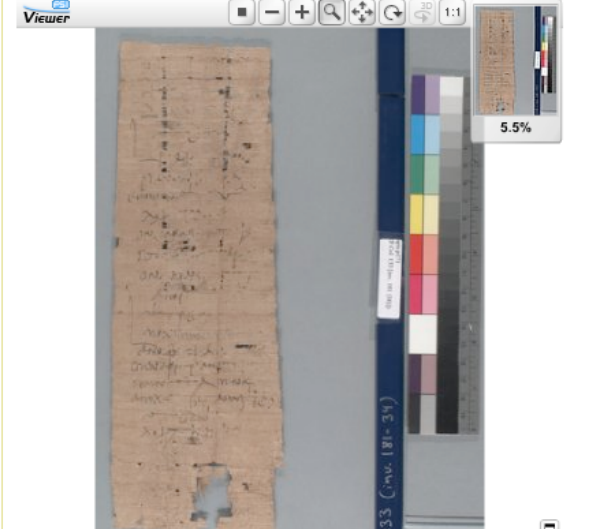
Title	Account of Grain
Publication Number	P.Col. VII 133
Provenance	karanis ; arsinoites ; egypt
Material	Papyri
Date	ca. 325 - 350
Print Illustrations	Microfiche im Band
Images on the Web	Abbildung im Internet

Duke Databank of Documentary Papyri Text [source] [navigate]

λοι(παὶ) (ἀρτάβαι) ο .
ὀν(όματος) Ἀραβικοῦ (ἀρτάβαι) ις
10 Πτολεμαῖος (ἀρτάβη) α ∠
ὀν(όματος) Ἡρακλέου (ἀρτάβαι) γ
ἀπορ( ) (ἀρτάβ) ..
(γίνονται) (ἀρτάβαι) ρβ ω^choice01
(ὧν) ἀποχὴ Παχούτ(ου) ...
15 Ἀνοῦφις δι(ὰ) Ἀπι. [. . .]ς
Οὐεναῦφρις πρ( ) Ἄμμωνι . . . . .
Παῦλος (ἀρτάβη) α Πανκρά[τις]
ἀποχὴ (ἀρταβῶν) β ∠ ιβ´ Ἀμάεις (ἀρτάβαι) ιβ ω
(γίνονται) (ἀρτάβαι) οδ δ´
20 λοι(παὶ) (ἀρτάβαι) κη γ´ ιβ´

Apparatus

Images on the Web

Viewer

5.5%

Translation [source] [navigate]

columbia.apis.p171 HGV Translation (English)

(from line 3) through Mari... Total, 79 1/3 artabas. From which ... ... Anouphis ... brother with Herakles, 4 1/3 artabas. Balance, 70 (+) artabas. On account of Arabikos, 16 artabas. Ptolemaios, 1 1/2 artabas. On account of Herakles, 3 artabas. For insolvent persons (?), .. artabas. Total, 102 2/3 artabas. From which, a receipt of Pachoutes ... Anouphis through Api... Venaphris ... Ammoni... Paulos, 1 artaba, Pankratis. Receipt for 2 1/2, 1/12 artabas. Amaeis, 12 2/3 artabas. Total, 74 1/4 artabas. Balance, 28 1/3 1/12 artabas.

...and then adjust the location and magnification in the image portlet (snippet view):
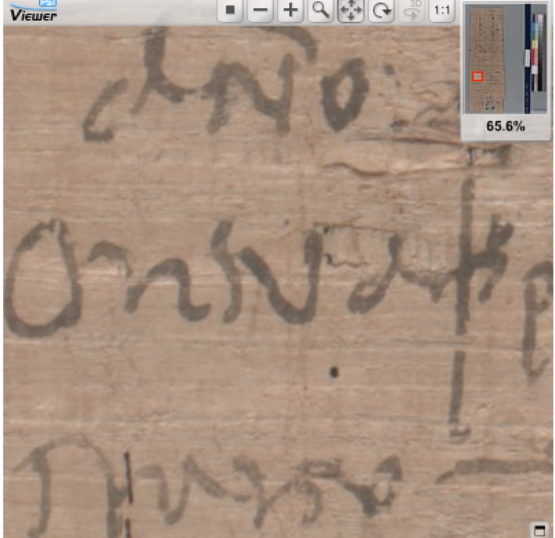
Bell in 1924; no. 34 in Bell's inventory

Language grc-Grek

Notes (General) Proficient, medium-sized hand ; Written along the fibers with 20 lines; the back is blank; the surface is badly rubbed

Subject(s) Account

Date 325 CE - 350 CE

Images on the Web

Viewer

65.6%

Duke Databank of Documentary Papyri Text [source] [navigate]

λοι(παὶ) (ἀρτάβαι) ο .
ὀν(όματος) Ἀραβικοῦ (ἀρτάβαι) ις
10 Πτολεμαῖος (ἀρτάβη) α ϛ
ὀν(όματος) Ἡρακλέου (ἀρτάβαι) γ
ἀπορ( ) (ἀρτάβ) . .
(γίνονται) (ἀρτάβαι) ρβ ω choice01
(ὧν) ἀποχὴ Παχούτ(ου) . . .
15 Ἀνοῦφις δι(ὰ) Ἀπι [. . .]ς
Οὐενᾶφρις πρ( ) Ἄμμωνι . . . . .
Παῦλος (αρτάβη) α Πανκρά[τις]
ἀποχὴ (ἀρταβῶν) β ϛ ιβ´ Ἀμάεις (ἀρτάβαι) ιβ ω
(γίνονται) (ἀρτάβαι) οδ δ´
20 λοι(παὶ) (ἀρτάβαι) κη γ´ ιβ´

Apparatus

True to the nature of the PN as an aggregator, not an owner, of content, portlets in the display are labeled and/or icon-branded to indicate the institution or project originating the data, and links are provided within portlets back to the partners.

Thus, the PN provides in a single interface the known-text browsing functions that the DDbDP, HGV, and APIS have traditionally provided via independent interfaces.

Browsing for Known Unpublished Texts

Imagine that a user has read, in a commentary on a published text for example, that Columbia owns an unpublished first-century CE document concerning nomination to a liturgy (columbai.apis.p1761) and would like to learn more. Again, the simple and intuitive interface allows the user to browse to the desired object:

The user is brought to a page where s/he confirms that the PN knows no DDbDP text or HGV metadata, but only the APIS metadata and high-resolution digital image:

columbia.apisp1761

| New Search | DDBDP Search | Numbers Search | Metadata Overview | Metadata Details | Text & Translation | News & Updates |

Primary Metadata Document [source] [navigate]

Metadata for columbia.apis.p1761(xml)

Title	Documentary text, [I AD?]
Summary	Document concerning the nomination of Didymos son of Didymos and Heraklous
Inv. Id	NNC:Col. inv. 538a + 542
Physical Desc.	1 papyrus fragment; 7.3 x 18.3 cm.
Provenance	Purchased by Columbia University through H.I. Bell, in 1930; no. II.32+42 in Bell's inventory
Language	grc-Grek
Notes (General)	31 lines; broken at right ; Abraded and with some worm holes: central part difficult to read ; The hand is fairly large and with a limited number of ligatures ; Written along the fibers; back blank
Date	1 CE - 99 CE

Supplemental Metadata

No related metadata available for oai:papyri.info:identifiers:apis:columbia:p1761 in other data sources

Duke Databank of Documentary Papyri Text

Images on the Web

Translation [source] [navigate]

HGV Translation (English) not available for columbia.apis.p1761.

This feature builds on and supersedes the earlier APIS known-text browse functions [http://www.columbia.edu/cu/lweb/projects/digital/apis/search].

Searching for Published Texts

A major component of papyrologists' work behavior is searching the Greek of published texts. To do this via the PN, the user navigates to a search interface that supports substring (strings of letters) and lemmatized (any form of a given Greek word) boolean searching, restrictable by date, place, publication series, or APIS collection. Thus, a user who is interested in the 'governor', or *stratêgos*, of the Arsinoite nome between 180 and 115 BC will search as follows [http://apptest.cul.columbia.edu:8082/navigator/portal/ddbdp-search.psml]:

Search Duke Databank of Documentary Papyri

Text Search

Search for: word or phrase: [strathgo/s]   [Search] [Clear Form]

[THEN ▼] word or phrase: [   ] within: [10] words

[THEN ▼] word or phrase: [   ] within: [10] words

Use ^ [SHIFT-6] to anchor a substring to a word boundary. Example: ^kai to search words beginning with kai

◉ input is in beta code

◯ input is **not** in beta code

☑ lemmatized search

Limit by

Place name   [Arsinoite]

Publication   series: [Select Publication Series ▼] volume: [ ]

APIS collection   [Select APIS Collection ▼]

Date   On or after: [180] [BCE ▼] On or before: [115] [BCE ▼]

Options

☑ respect capitalization

☑ respect diacritics/accents

☐ hide highlighted fragments (faster)

Show records with:

☐ **images** first

☐ **translations** first

...and among the search returns will find the following:

(i) **p.erasm.1.2[html]**	P.Erasm. I 2	none	nach 30. Sept. 152 v.Chr.	oxyrhyncha ; arsinoites ; egypt

(line 3) Μελαγκόμαι ἀρχισωματοφύλακι καὶ **στρατηγῶι** … (1.0)
(line 16) παραγενόμενος ἐπὶ ὁ **στρατηγὸς** … (1.0)
(line 2) τῶι **στρατηγῶι**. … (1.0)

(i) **p.erasm.1.3[html]**	P.Erasm. I 3	none	5. - 15. Mai 166 v.Chr. (Monat und Tag unsicher)	oxyrhyncha ; arsinoites ; egypt

(line 4) Δημῶνακτι τῶν ~τωμ φίλων καὶ **στρατηγῶι** … (1.0)

(i) **p.genova.3.92[html]**	SB XVI 12821 P.Genova III 92	none	29. Aug. - 27. Sept. 165 v.Chr.	arsinoites ; egypt

(line 20) ἢ δ᾿ ἐλλίπωσιν ἐν κε· τὸν δὲ **στρατηγὸν** … (1.0)
(line 15) **στρατηγὸν** καὶ τὸν οἰκονόμον καὶ τὸν βασιλικὸν … (1.0)

(i) **p.heid.6.364[html]**	P.Heid. VI 364	none	nach (?) 14. Dez. 172 v.Chr. (Jahr unsicher)	arsinoites ; egypt

(line 11) καὶ **στρατηγῶι** ἐκχωρεῖν προσα … (1.0)

(i) **p.koeln.3.144[html]**	P.Köln III 144	none	3. Febr. 152 v.Chr.	arsinoites ; egypt

(line 25) Μελαγκόμαι τῶι ἀρχισωματοφύλακι καὶ **στρατηγῶι** ἀμπελῶνι … (1.0)
(line 7) Μελαγκόμαι τῶι ἀρχισωματοφύλακι καὶ **στρατηγῶι** ἀμπελῶνι ρότερον Λάμπρου λεγομένωι μισθοῦ … (1.0)

(i) **p.lips.2.125[html]**	P.Lips. II 125	none	8. Febr. 173 v.Chr. (Jahr unsicher)	philadelphia ; arsinoites ; egypt

(line 2) καὶ **στρατηγῶι** … (1.0)

(i) **p.mil.congr.xiv.pg34[html]**	SB XIV 11273	none	2. Hälfte II v.Chr.	arsinoites ; egypt

(line 18) δικαίων παρά σοῦ, **στρατηγὲ** σεμνότατε. … (1.0)
(line 2) καὶ **στρατηγῶι** ~στρατηιγωι … (1.0)

(i) **p.mil.congr.xviii.pg10[html]**	SB XVIII 13093	none	143 - 141 v.Chr. (?)	arsinoites ; egypt

(line 11) γενομένωι **στρατηγῶι** καὶ κατ᾿ ἐκεῖνον μὲν τὸν καιρὸν … (1.0)
(line 1) Πτολεμαίωι Πύρρου τῶν πρώτων φίλων καὶ **στρατηγῶι** … (1.0)

(i) **p.muench.3.1.51[html]**	P.Münch. III 51	none	vor 27. Jan. 134 v.Chr.	sebennytos (arsinoites)

(line 27) τὸν **στρατηγόν**, ὅπως μεταπεμψάμενος … (1.0)

(i) **p.prag.2.124[html]**	P.Prag. II 124	none	143 - 124 v.Chr.	euhemeria ; arsinoites ; egypt

(line 2) φίλων καὶ **στρατηγῶι** … (1.0)

p.ryl.4.572[html]	P.Ryl. IV 572	none	II v.Chr.	arsinoites

(line 1) **στρατηγῶι** χαίρειν. … (1.0)

p.ryl.4.577[html]	P.Ryl. IV 577	none	vor 16. Dez. 147 v.Chr. (?)	arsinoites ; egypt

(line 1) Ἀσκληπιάδηι συγγενεῖ καὶ **στρατηγῶι** … (1.0)

(i) **p.tebt.1.101[html]**	P.Tebt. I 101	Receipt for a payment to a bank, 11 Oct. 120 B.C.	11. Okt. 120 v.Chr.	tebtynis ; arsinoites ; egypt

(line 3) **στρατηγῶι** Πτολεμαίωι τῶι παρὰ Διδύμου τραπεζίτου … (1.0)

(i) **p.tebt.1.12[html]**	P.Tebt. I 12	Two letters of Menches : drafts, 4 Sept. 118 B.C.	4. Sept. 118 v.Chr.	arsinoites ; egypt ; kerkeosiris

(line 20) ἐσμεν ἀσχολίαι ~ασχολι καὶ διότι ἐν τῆι τοῦ **στρατηγοῦ** … (1.0)

From the list of hits the user may navigate to the default PN view of a given text, as above, or to a standalone HTML representation of thereof (the internal links at the top are an artifact of the conversion process and do not function; under ongoing IDP2 work these pages will become directory-based, browsable, archival static html representations of the DDbDP contents):

p.muench.3.1.51

135/134BC Sebennytos?

r

```
        (hand 2) Ἀπολλωνίωι.
        ἐξαποστεῖλαι. (ἔτους) λϛ Τῦβι δ.
        (hand 1) βασιλεῖ Πτολεμαίωι καὶ βασιλίσσηι
        Κλεοπάτραι τῆι ἀδελφῆι καὶ βασιλί[σσηι]
   5    Κλεοπάτραι τῆι γυναικὶ θεοῖς Εὐερ-
        γέταις χαίρειν
        Πετεσοῦχος Παλοῦτος βασιλ[ικὸς]
        γεωργὸς τῶν ἀπὸ Σεβεννύτ[ου]
        τῆς Ἡρακλείδου μερίδος τοῦ
  10    Ἀρσινοίτου νομοῦ. ἀδικοῦμαι
        ὑπὸ Ἐρχίμιος τοῦ Ἀρυώτου κ[αὶ]
        Φανείθου(*) τοῦ υἱοῦ τῶν ἐκ Τ. .[. . .]
        τοῦ Ἡρακλεοπολίτου. ὑπαρχόν[των]
        γάρ μοι ἐν τῆι α[ὑ]τ[ῆι] κ[ώ]μ[ηι Τ . . . . .]
  15    πατρικῆς οἰκίας [αἱ τῶν προσ]-
        όντων τόπων καταφ[ρ]ο[ν]ήσ[ας μου]
        τῶι κεχωρίσθαι με διαπεπ.[ - ca. ? - ]
        ταῦτα καὶ τὴν καθαίρεσιν [τῆς]
        οἰκίας ἀπενηνεγμένος .ον.[ - ca. ? - ]
  20    ὑπερῷον(*), καὶ διακωλυθεὶς ὑπ᾿ ἐμ[οῦ]
        Σοκμῆνις Πασίωνος οἰκοδομῆ[σαι]
        ἐν οἷς ἐώνητο ἀπὸ τούτων το.[ - ca. ? - ]
        οὐ προσέσχεν. διὸ τὴν ἐφ᾿ ὑμᾶς κ[ατα]-
        φυγὴν πεποιημένος(*) δέομαι ὑμ[ῶν]
  25    εἰ δοκεῖ προστάξαι χρηματίσαι μ[ου]
        τὴν ἔντευξιν ἐπὶ Πολέμαρχ[ον]
        τὸν στρατηγόν, ὅπως μεταπ[εμ]-
        ψάμενος αὐτούς, ἐὰν ᾖ οἷα γράφω,
        προνοηθῆι, ὡς τεύξομαι τῶν
  30    δικαίων. τούτου δὲ γενομένου [ἔσο]-
        μαι τετευχὼς τῆς παρ᾿ ὑμῶ[ν - ca. ? - ]

        Text breaks
```

v

```
        (hand 2) [ - ca. ? - ] Πετεσού(χου) Ἀπολλωνίωι
```

Apparatus

^ 12. corr. from φανιθου
^ 20. υπερων pap.
^ 24. πεποημενος pap.

This function massively improves on and supersedes the now-defunct Perseus installation of the DDbDP. The search operates on all DDbDP texts (Perseus could display all but searched on only a subset of the data); the metadata search constraints function reliably; the ability to sort results by presence of translations and or images is a much welcome addition; and the search engine is many times faster than all previous versions.

Searching for Unpublished Texts

Imagine that the user who had been directed to the unpublished nomination to liturgy which is in the Columbia collection and was mentioned above

(columbia.apis.p1761), would like to know whether there are other contemporary nominations that also lay unpublished. The user simply navigates to the search interface and enters the appropriate criteria [http://apptest.cul.columbia.edu:8082/navigator/portal/default-page.psml]:

The list of search returns reports that APIS knows of four other unpublished nominations from roughly the same period (columbia.apis.p1745, columbia.apis.p1746, duke.apis.30563356, michigan.apis.4114). And so a scholarly project is born:

Metadata Search   ⊟ □

Revise Search

Results 1-11 (of 11)
date:start:index:{-00000.a.a TO 000200.l.ze] ; date:start:index:[000001.a.a TO 009999.l.ze} date:end:index:[000001.a.a TO 009999.l.ze] ; +allNoTrans:nomination

Go to Page: **1**

	Document Id	Title	Publication	Inventory	Date	Provenance	Language	BL
[view]	columbia.apis.p1745	Nomination? [II/III AD]		NNC:Col. inv. 530a recto	100 CE - 299 CE		grc-Grek	

Nomination? [II/III AD] ; grc-Grek ; Perhaps a **nomination** to a liturgy. Ends with a list

| [view] | columbia.apis.p1746 | Account, [II AD] | | NNC:Col. inv. 530a verso | 100 CE - 199 CE | | grc-Grek | |

; on the recto, a **nomination** to a liturgy

| (i) [view] | columbia.apis.p1761 | Documentary text, [I AD?] | | NNC:Col. inv. 538a + 542 | 1 CE - 99 CE | | grc-Grek | |

Documentary text, [I AD?] ; grc-Grek ; Document concerning the **nomination** of Didymos son of Didymos

| (i) [view] | duke.apis.30563356 | Petition [between 137 and 142] | | NcD:P.Duk.inv. 489 | 137 CE - 142 CE | | grc-Grek | |

the **nomination** to a public office. Mentions Ptolemaios son of Ammonios. Refers to an order by the praefectus

| (i) [view] | michigan.apis.2465 | Official Letter: Nomination of Liturgists, 196-198 A.D. | SB XXII 15783 | MiU:P.Mich.inv. 5458 | 196 CE - 198 CE | | grc-Grek | |

Official Letter: **Nomination** of Liturgists, 196-198 A.D. ; grc-Grek ; arsinoite ; arsinoites ; egypt

| (i) [view] | michigan.apis.2529 | Document Concerning the Gymnasiarchia, IIIrd century A.D. | SB XXIV 15890 | MiU:P.Mich.inv. 5710 | 200 CE - 299 CE | | grc-Grek | |

with the **nomination** of one or several gymnasiarch(s). ; 8 ; Location: Cairo ; Pub. status: Recto

| (i) [view] | michigan.apis.2809 | Official Letter: Nomination of Liturgists(?), ca. 194 A.D. | SB XXII 15760 | MiU:P.Mich.inv. 6318 | 194 CE | | grc-Grek | |

Official Letter: **Nomination** of Liturgists(?), ca. 194 A.D. ; grc-Grek ; arsinoite ; arsinoites

| [view] | michigan.apis.4114 | Nomination to office, IInd century A.D. | | MiU:P.Mich.inv. 214 | 100 CE - 199 CE | | grc-Grek | |

Nomination to office, IInd century A.D. ; grc-Grek ; 18 lines ; Location: Ann Arbor ; Pub. status

| (i) [view] | princeton.apis.p583 | Loan, 141 AD(?), March 31 | P.Princ. III 121 | NjP:AM 8936 | 31. März 141 (Jahr unsicher) | | grc-Grek | |

Loan, 141 AD(?), March 31 ; grc-Grek ; arsinoites ; theadelphia ; philadelphia ; egypt ; **Nomination**

| [view] | wisconsin.apis.5378 | Petition Concerning Liturgies, (Early) IIIrd century A.D. | P.Wisc. I 2 | WU:P.Wisc. inv. 40 | 200 CE - 299 CE | | grc-Grek | |

that they are exempted from **nomination** for the performing of municipal duties. Once before they had been

| (i) [view] | wisconsin.apis.5449 | Liturgy list, (late) IInd/(early) IIIrd century A.D. | P.Wisc. II 85 SB VIII 10193 P.Leit. 2 | WU:P.Wisc. inv. 51 | 15. Okt. 226 (Jahr unsicher) | | grc-Grek | |

Severus (15.10.226 A.D.) cannot be excluded. The text is a **nomination** of every time two men to superintend

Results 1-11 (of 11)   Go to Page: **1**

Revise Search   New Search

This feature supersedes that of the previous APIS search interface, offering wherever possible the distinct improvement of single-click access, direct from the search returns, to APIS metadata, Greek text, HGV metadata, translation (whether from APIS or HGV), and image (see P.Wisc. II 85, the last on this list).

Summary

The PN interface supports the full range of current web-based papyrological use-cases, including browsing to known published documents, translations, metadata, and images; browsing to known unpublished papyri, metadata, and images; sophisticated searching of published documents, along with associated translations and metadata; and searching of metadata associated with unpublished papyri in APIS collections. In all of its features the PN is faster and more powerful than the legacy systems that it supersedes.

Papyrological Navigator: Project Overview

DDbDP-HGV EpiDoc Conversion

The first step in the process, the need that first motivated the project, was to put the DDbDP and HGV on a shared and standards-based technological footing, in short to

convert them to EpiDoc XML. The Centre for Computing in the Humanities (CCH) at King's College London took the lead role in this process.

DDbDP

First, we elected to encode the DDbDP not in a highly customized one-off schema but in a robust, widely accepted standard used by papyrology's sister-discipline, epigraphy. How well EpiDoc would suffice as a format for digital Papyrology was an unknown at the beginning of the project, but it has proved more than adequate to the task. A few extensions have been applied to the guidelines and schema to accommodate DDbDP distinctions not previously identified in epigraphical markup, but on the whole the two communities of practice are now largely working with the same set of tags and recommendations.

The first step in the conversion process was to convert the legacy SGML files to an intermediary XML, on which more sophisticated processing could be executed. The SGML files had been structured one per publication series, some of which run many thousands of texts, with the result that the unwieldy files had accumulated extensive mistagging that in effect obscured hundreds of texts from the user's view. These intermediary XML files were then split, by File Splitter, generating one discrete XML file per papyrus document, a process that allowed us to (painstakingly) 'recover' these 'lost' documents.

Next, the complete library of XML texts was run through a series of discrete conversion modules: Transcoder, CHET-C, and Greek Number Converter.

Transcoder was first deployed to convert the Beta Code characters to Unicode. Transcoder was originally developed in 2003 by H. Cayless to address the problem of converting between Greek encoded in Beta Code, GreekKeys, and other legacy formats, to Unicode. One of the aspects of the tool that makes it different from others in this space is its ability to perform bidirectional encoding shifts. This feature, and the fact that it is implemented as a Java library, have led to its being incorporated in a number of projects over the years, including Demos and Perseus. The IDP1 grant has allowed a thorough reworking of the Beta Code translation part of the software, including a number of bug fixes, and a vastly improved ability to support the transcoding of text embedded in XML documents. The updated transcoder has already been released at its home on SourceForge under an LGPL license.

The first incarnation of the Chapel Hill Epigraphic Text-Converter, created by T. Elliott in 2003, was based on Microsoft Access and provided a form-based interface that allowed Epigraphic texts to be entered in Leiden form and then transformed via a series of regular expressions into EpiDoc XML. The Access version was followed by a completely rewritten Java version by H. Cayless, and subsequently by a Javascript port that allowed the Leiden-to-EpiDoc conversion to run entirely in a web browser. The IDP project required both a quantum leap in sophistication, as the converter would be required to support not just Leiden, but also beta code escapes, and a script-based port that could be executed as part of an integrated conversion pipeline. To support this process, CCH converted CHET-C to the Python scripting language and added significant Beta-Code-to-XML conversion support, as well as an XSLT module to clean up the XML and remaining SGML. The CHET-C module in the conversion pipeline converted the intermediary XML to validating EpiDoc.

In the conversion process the CCH team identified a task that we had considered too complicated to include in original proposal, but which they were able to embed in the conversion process with benefits far outstripping the cost. The DDbDP had always entered ancient Greek numbers as Arabic numerals; it was thought that this might later allow machine-aided computation of accounts and the like. The CCH team devised a Greek Number Converter module that both tagged and converted almost all Greek numerals, both whole numbers and fractions, so that users may display Greek (as they expect) but may one day make computational use of the numbers, which remain embedded in the XML tags, as originally intended.

This process was run iteratively via Runner, a set of Python and Shell scripts that muster and serialize the various elements of the DDbDP-to-EpiDoc conversion process (Transcoder, file splitter, Python and XSLT modules of CHET-C, Greek Number Converter) to generate directories of Unicode EpiDoc TEI XML. A clean-up process embeds crucial HGV metadata, which reflects the mapping of DDbDP documents to HGV and also to [Trismegistos](). It also includes a testing mechanism for comparing output of selected files and patterns with expected output.

The scope and scale of the conversion task was massive (55,000 heavily marked up papyrus documents, some of which run to many print pages), and the Runner framework worked admirably. Still, some thousands of discrete tags could not be reliably and accurately bulk-converted by the regular expression-based pipeline, given the time and personnel available and the scale of the task. The vast majority of these exceptions are generated by overlapping hierarchies arising from Leiden tags, which SGML allowed but XML does not. Thus, the Runner framework was outfitted with Safety Net, which in effect captured, logged, and organized texts that failed to convert at any stage of the process so that the failures could be diagnosed and regular expressions improved iteratively to the point of (a) solution and total conversion or else (b) conversion as far as resources allowed. The result of this less than fully complete conversion is that some Leiden brackets (e.g. "abc[...]" indicating lacuna, or "abc<def>" indicating editorial insertion) remain in the XML and are not encodeed semantically in EpiDoc. They are nevertheless searchable and will display as papyrologists expect. This residual Leiden will be scrubbed during IDP2.

The conversion was otherwise entirely lossless. No documents were lost--and indeed hundreds were recovered--in the process.

HGV

The DDbDP conversion would be developed as an iterative process, the goal was a single ultimate conversion so that all subsequent processing would be run on Unicode EpiDoc XML, not on the legacy encodings. The HGV, by contrast, required a repeatable EpiDoc conversion process, since its local management and display of data will continue as is, with FileMaker. To accomplish the task, CCH devised the HGV Metadata Crosswalk, a conversion process written principally in XSLT 2.0 that takes as input the XML export from the HGV Filemaker database, and creates from it some 65,000 EpiDoc TEI XML files (one per record) containing the metadata marked up according to the EpiDoc recommendations. Several data classes or groups thereof in HGV that require complicated and idiosyncratic processing (in particular dates, placenames, and bibliography, some of which is managed in a parallel related database), and therefore specialized scripting, to move from one complex schema to

another.

HGV also maintained English and German translations of DDbDP texts in a custom-designed XML DTD, including an idiosyncratically architected "Glossary" of commentary and technical terms. An HGV Translation Crosswalk was devised to convert both translations and glossary to EpiDoc XML. Henceforth, both shall be the canonical format for managing and populating data.

A separate module in the Runner serializes and manges this process, as with the DDbDP conversion.

No metadata records or translation files were lost in the process.

Runners

For this project, several "Runners" were created to handle different tasks, the "core" DDbDP text conversion, the conversion of the translations, the conversion of the HGV metadata, and the subsequent aggregation of derivatives into the master EpiDoc TEI XML file. All were written in Python, and heavily parameterized to support incremental conversion and testing of individual steps in a conversion process (for example, to run only the transformation into EpiDoc HTML, or to run only the CHET-C module to remove Leiden). To improve performance for completing an end-to-end run of the main conversion process, a Java-based interface to the Saxon XSLT engine was written that enabled batch XSLT transformations to happen in parallel.

APIS

The CCH team devised a set of replacements and XSLT plug-ins for CHET-C, as an APIS Translation Crosswalk, to be used for converting existing free-text APIS translations into EpiDoc XML. This process is not yet implemented in the conversion pipeline, as it remains for APIS institutions, under IDP2 and APIS VI, to decide how they wish to handle this data.

Aggregated XML

The process of assembling the three discrete EpiDoc XML streams (DDbDP, HGV metadata, HGV translations) is accomplished by the XML Aggregator. The Aggregator is an XSLT-based tool that maps and compiles all related files into single EpiDoc XML files, one per bibliographic object. The Aggregator also performs the crucial function of identifying texts that have HGV metadata but no Duke text, and creating a "stub" in the file XML, into which the DDbDP text can be entered. These stubs facilitate data-entry workflow management. These are the canonical files on which all subsequent PN processing operates.

Stylesheets

Standard EpiDoc XSLT stylesheets have been a core component of the EpiDoc toolset for several years, maintained by T. Elliott, G. Bodard, and H. Cayless. For the IDP project CCH significantly refactored these stylesheets, in a more modular and parameterized form to support conversions and testing, and especially papyrological-style Leiden output from the DDbDP texts. Papyrological implementations of Leiden

differ significantly from epigraphical. Moreover, the stylesheets were modified to support pure-text (UTF-8) output as well as HTML output. These stylesheets are used by PN to transform the aggregated EpiDoc XML.

Papyrological Navigator

Columbia University took the lead in developing the Papyrological Navigator.

Jetspeed-2 Portlet Framework
The Columbia and IDP leadership agreed that a portal framework, which renders the data sources (APIS, HGV, etc.) as individual aggregated portlets, offered the closest approximation of the interface models in early PN planning. The Jetspeed-2 framework allowed us to port an initial code base over from APIS, and had offered support for user preferences (which remains a desired feature).

User Interface
The PN team considerably improved the look and feel of the user interface so that it (1) conforms closely to papyrological convention, conditioned as it is by print publications (metadata above text, text above apparatus, vel sim.), and (2) facilitates the juxtaposition of text and image, text and translation, primary and secondary metadata. The PN team also dramatically improved image viewing capabilities, enabling in-portlet manipulation of digital images of papyri. The current image viewing solution has two parts: the eRez imaging server, which delivers high-resolution TIFFs, and the FSI viewer, a Flash object that puts the eRez-served images behind a flexible pan/zoom interface. To support these tools, IDP included the ingest of many TIFFs, and the creation of a dynamic configuration application for the FSI viewer.

The FSI viewer is proprietary, and we have begun already under IDP2 to explore free applications that offer comparable functionality. The PN team paid careful attention to branding, such that data from each partner is labeled and/or icon-stamped in the portlet so that users can identify the source of the data quickly and easily. Original plans to operationalize portlets for user-defined preferences were sensibly deferred, since this sort of customization is an essential feature of work conducted under IDP2.

Searching
In order to offer full-text searching of the DDbDP, PN developers evaluated modern Greek Lucene libraries as well as broader Lucene frameworks, such as SOLR and XTF. Because none of these frameworks supported the search requirements of the DDbDP, IDP included the development of customized Ancient Greek tokenizers and indexers to accommodate searches that are sensitive to capitalization and diacritic marking in the source text. PN's full-text index of the DDbDP also includes indexed metadata drawn from the merged APIS-HGV XML index previously in the Navigator, allowing the full text search to be augmented by metadata filters.

Existing substring search methods in Lucene were too slow to support the DDbDP search requirements, particularly when used in phrase searching. Thus, IDP development included customized Lucene query mechanisms that occasioned dramatic performance improvements in substring searching by augmenting the document index with a supplementary index that mapped two-character term segments ('bigrams') to search terms.

The PN delivers lemmatized searching by building a term index, mapping the original forms of words in the DDbDP texts to a lemmatized form drawn from the morphological tables (essentially, Morpheus, developed by the Perseus project) hosted by [Archimedes](#). This index is built via the XML-RPC web services that Archimedes exposes, and will be available in the PN codebase following a determination of license. While the lemmata are imperfect (and thus experimental), the method of incorporating a related specialized web-service into the DDbDP search tool where applicable was judged the most progressive and efficient way of supporting such searches, especially since Perseus' future plans for Morpheus are still in flux. For this reason, the team deferred implementation of morphological linking in Greek display.

Project Mapping
Over the course of IDP1, PN was augmented by an RDF-XML interface to the hierarchy of document identifiers in the various metadata sources, including the related identifiers along other branches of the hierarchy for a given identifier. This data was also exposed via an HTML search interface in the PN. While the Number Server data currently provides correspondences between APIS, HGV, DDbDP, and TM, as an infrastructure, it will ultimately support a more robust reckoning not only of digital identifiers but variants among print publication citations. Indexes are generated from merged DDbDP-HGV xml and APIS data, automatically harvested via SVN (DDbDP-HGV) and OAI-PMH interface (APIS).

Standards
APIS metadata is now expressed both as Dublin Core and a more elaborate Dublin core extension available now through an OAI-PMH Repository interface to APIS. The PN codebase and documentation are stored in the NYU ISAW IDP wiki and SVN instance [http://idp.atlantides.org/trac/idp/wiki], discrete portions to be released under GNU GPL as work under IDP2 and APIS VI proceeds.

APIS Expansion

One of the primary IDP1-related APIS tasks was creation of a central repository of archival images at Columbia University. The purpose of this repository was to help ensure the long-term preservation of APIS content, so that the benefits of institutions' collective investment in the APIS project could be sustained into the future; and to make possible the migration of APIS image content to newer types of image presentation and display technologies (e.g., the eRez/FSI display now used in the Papyrological Navigator, JPEG2000, etc.) that will further the scholarly and curricular use of APIS, particularly in the context of the Papyrological Navigator search-and-retrieval system. The creation of the central TIFF repository of APIS images will enable in-portlet viewing of a much larger number of objects than are currently available. Over the past year, participating institutions began sending their archival images, and APIS now has a complete set of image files from Duke University, as well as from
all partners whose records are hosted at Columbia (e.g., the Hermitage Museum, British Museum, etc.). APIS expects to receive content from the University of Michigan and Berkeley University some time in 2009 or 2010.

Also under IDP1, new APIS collections were brought into the fold: The British Museum, Fordham University, and the Egyptian Museum in Cairo (made possible by a Mellon-funded project at the Centre for the Study of Ancient Documents in Oxford [http://ipap.csad.ox.ac.uk]).

Ongoing HGV Work

Working in close coordination, Heidelberg and CCH achieved lossless mapping and conversion of HGV metadata and translations to EpiDoc XML, correct merging of those streams with DDbDP texts, and quality control of the merged output. Ongoing data entry and HGV-DDbDP-TM-APIS mapping proceeded apace, such that the EpiDoc version of EpiDoc metadata is fully up to date with print publications.

The scale and scope of papyrological expertise required to oversee the conversion process, particularly of the DDbDP, meant that two proposed tasks were slowed or deferred to allow devotion of more person-hours to the process of ensuring full and accurate conversion. Thus, work on a bilingual index of controlled metadata vocabulary was deferred and will probably be carried out under APIS VI, which is already funded by the NEH); ongoing translation work was similarly slowed in order to free up time to vet DDbDP-HGV conversion.

Release of Texts and Data

In addition to the publicly accessible search and browsing services provided via the Papyrological Navigator, the IDP partners are in process of releasing at NYU ISAW a static, browseable view of all DDbDP and HGV content, as well as a complete archive of content for easy download. This collection contains all complete texts in the Duke Databank and all complete records in the HGV as of the release date. It includes both the EpiDoc XML versions and the web-ready XHTML versions. All HGV content is copyright Institut für Papyrologie, Universität Heidelberg. All DDbDP content copyright editors of the DDbDP. All content is released under Creative Commons License (Attribution 3.0 Unported (cc-by): http://creativecommons.org/licenses/by/3.0.

The same site [http://idp.atlantides.org/trac/idp/wiki], which serves also as the IDP2 project management wiki, contains all code generated under IDP, in Subversion; discrete elements, issued under GNU GPL will be checked into Sourceforge as work under IDP2 and API VI proceed. The ISAW subversion repository will also contain archived final-state copies of the complete contents of the bug-tracking/project management environment used for the project, as well as the development wiki (which includes project speccing exercises, minutes from worksprints as well as regular and periodic meetings, etc.), and other web-based shared resources (an array of GoogleDocs) instrumental in project development. Assembly, archiving, and release of this ancillary material was not an envisaged task and so proceeds now independent of, but concurrent with, IDP2 and APIS VI.

Ongoing Leadership

Original plans entailed the creation of a governing board for the DDbDP, construed as a legal entity, on the model recently adopted by APIS. But as planning of the SoSOL online distributed data-entry environment, currently in development under IDP2, proceeded, it became clear that the APIS model was less well suited to the DDbDP. What we had in mind for the DDbDP was not a federation of independent owners of data, but a much more broadly based disciplinary asset. The DDbDP will have need for the sort of top-down decision-making with which APIS is regularly concerned mostly in the domain of encoding and the technological services of the PN.

Thus, we have refactored the original plan in two ways. First, the ways in which the papyrological community controls DDbDP data will be a feature of SoSOL design (derived from configurable rules-based editing privileges that will be administered by the PN/SoSOL host), and canonized under the training and documentation portion of the IDP2 project, currently under way. Decisions as to inclusion or exclusion of data, editorial practice, etc., will will be made by the community of users, in collaboration with--and implemented by--the DDbDP editors (as construed under IDP2), whom DDbDP, HGV, and APIS leadership will invite in the course of IDP2, and conditioned by what the PN technological host(s) deems feasible.

Second, the area in which centralized decisions will have the potential to affect the will of the scholarly community is in encoding and standards, in short, the realm of the PN. The papyrological community may wish to include Coptic documents, or Greek 'Paraliterary' papyri, vel sim., but if corpora of such are not encoded for interoperability, the will of the community will be irrelevant. Thus, we envisage a steering committee for the PN, rather than for the DDbDP itself. This committee will be composed of members from all of the contributing projects, and from key figures in the user-community, and will help to ensure (a) that the projects served up by the PN grow in step with, or at least are informed of, technological developments, (b) that potential new partners are well informed as to technical requirements for participation, (c) that enhancement efforts across multiple PN-served projects minimize duplication of effort, (d) that various PN-served projects have a better chance at making common cause in future enhancement and maintenance efforts, including grant-getting etc.