

THE JUBILEES PALIMPSEST PROJECT

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VENERANDA
BIBLIOTECA AMBROSIANA



ST. MARY'S
UNIVERSITY



NATIONAL ENDOWMENT FOR THE
Humanities

Palimpsest

The Jubilees Palimpsest Project
Pioneering the Recovery of Illegible Text from
Ancient Manuscripts Through New Tools in
Digital Archaeology

Contents

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- A comprehensive open repository of advanced images of the Jubilees Palimpsest, followed by the other palimpsests in the Biblioteca Ambrosiana ([LINK](#))
- Standards-compliant viewers and annotation workspaces ([LINK](#))
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- Extended Spectrum color processing ([LINK](#))
- Easy access to Spectral RTI ([LINK](#))

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Resources and Links





BIBLIOTHECA AMBROSIANA

BIBLIOTHECA AMBROSIANA





D 341 ar - 00 21 ar

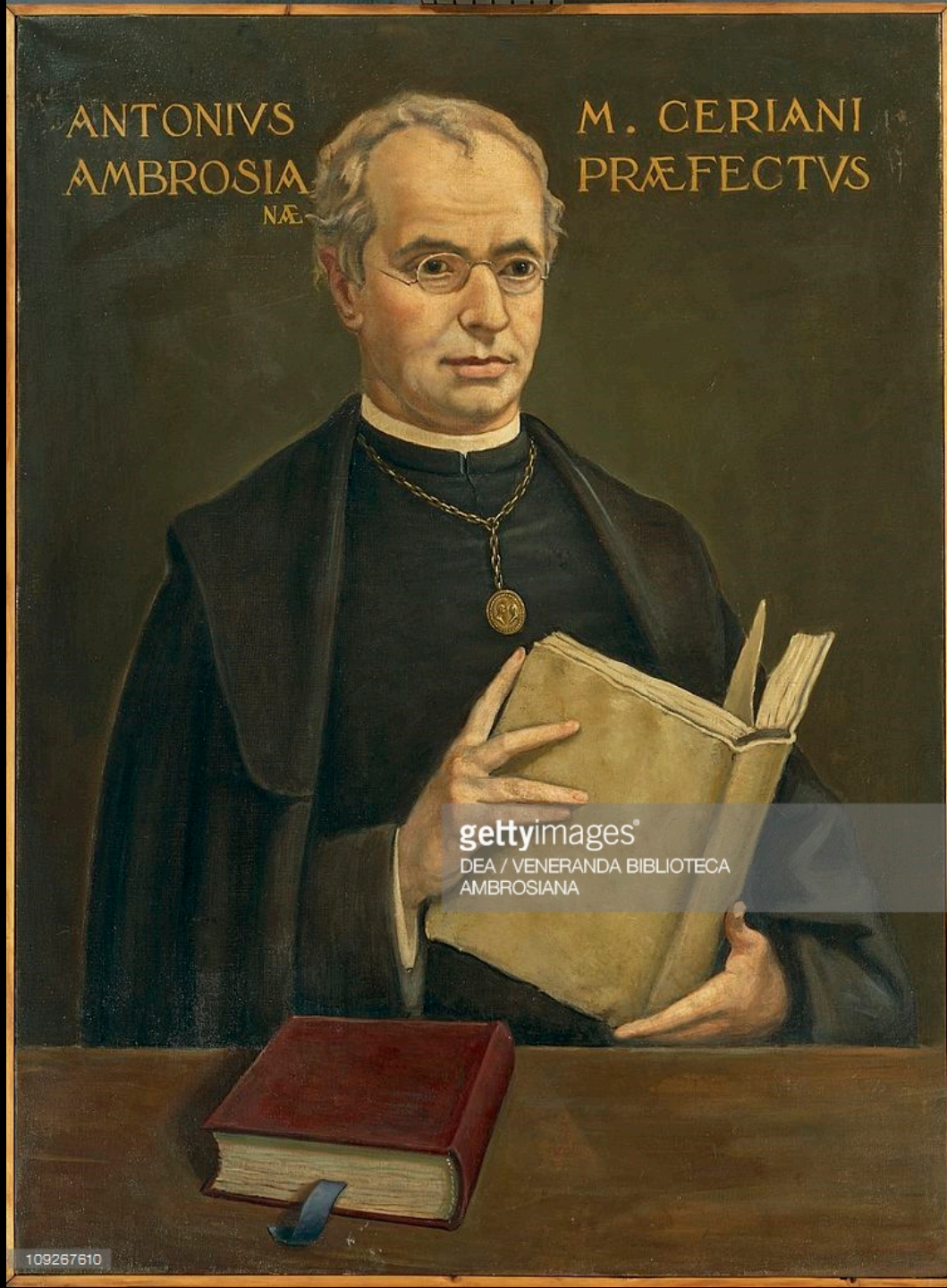
D 303 ar - 00 23 ar

Fragment of an ancient papyrus scroll with several lines of handwritten text in a cursive script, likely Coptic. The text is partially obscured by the torn and overlapping nature of the fragments.

64

NON QUIA ISTA ADIPI ME COPPICENDAS SUNT. ET POPULUS
 AOND QUOD PLASME TEL. LEGIT DICIT AMEN. SED TA
 MES ME TO LEI A NDAS UNTA BEIS Q. ND DICEIMAR
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Adhamil ca...

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AMBROSIANA

109267610

110. a. rum dimittes illis
secus quod place-
bit domino eorum in iu-
dicio et iustitia

autem postquam
intrabunt in terram
suam annos
et postea dominabi-
tur a principibus et
tyrannis per annos
xviii et xviii annos
abrumpens tibi x
nam descendent tri-
bus duae et transfe-
runt scenae testi-
monium tunc deus
caelestis fecit pa-
lam scenae suae
et ferrum sanctua-
rii sui et ponentur
duae tribus sanctita-
tis nam x tribus sta-
bilibunt sibi secus
ordinationes suas
regna et adferent

uictimas per annos
xx et vii circumual-
labunt muros et
circumibo viii et
adcedent ad testa-
mentum domini et finem
polluent quem fe-
cit dominus cum eis et im-
molabunt natos
suos diis alienis et
ponent idola scenae
seruientes illis
et in domo domini faci-
ent scelestae et s-
culpent omnem ani-
malium idola multa

illis temporibus
ueniet illis ab ori-
ente rex et teget
equitatus terram
eorum et incendet
colonia eorum igne
cum aede sancta

109. a. domini et sancta uasa om-
nia tollet et omnem
plebem eiciet et du-
cet illos in terram
patriae suae et duas
tribus ducit secum

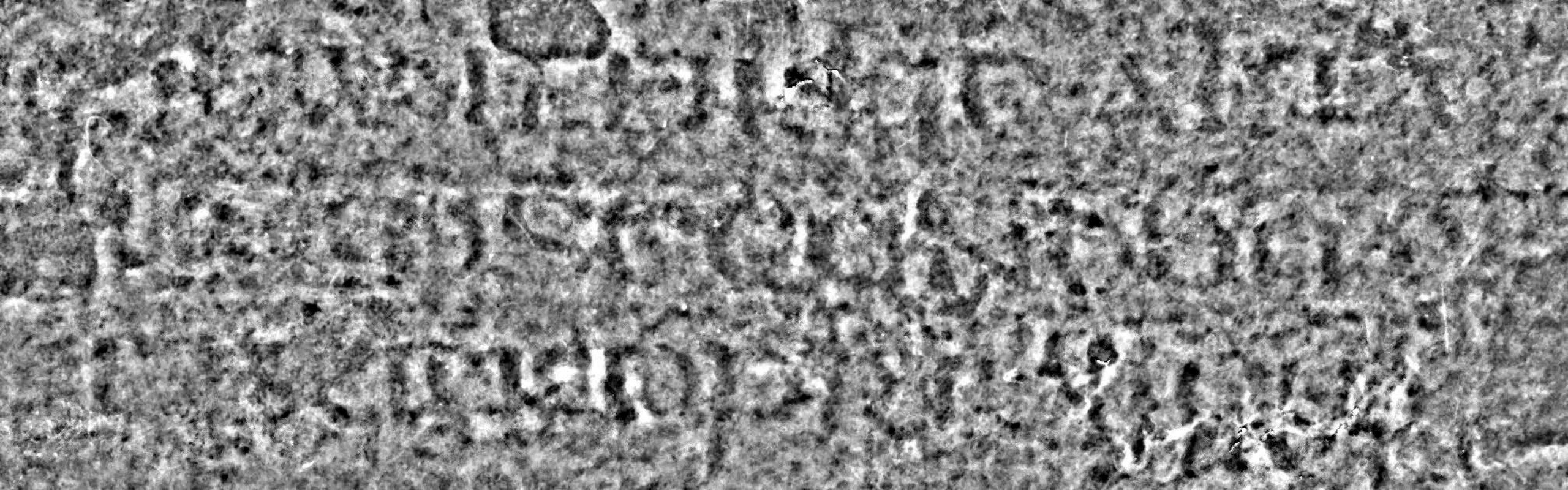
Tunc inuocabunt
duae tribus x tribus
et ducent se ut liena
in campis puluerati
esurientes et siti-
entes cum infantibus
nostris et clamabunt
iustus et sanctus dominus
quia enim uos peccas-
tis et nos pariter ad-
ducti sumus uobis-
cum tunc plora-
bunt x tribus audien-
tes inproperia uer-
borum tribus dua-
rum et dicent quid
faciemus uobis fra-
tres nonne in omnem
domum istrabel ad-
uenit clibsis haec
et omnes tribus plora-
bunt clamantes in
caelum et dicentes
deus abraham et deus isa-
ac et deus iacob remi-
niscere testamen-
tum tuum quod fac-
tasti cum eis et ius-
iurandum quod iu-
rasti eis per te ne um-
quam deficiat semen
eorum a terra quam
dedisti illis

Tunc reminiscentur
me die illo dicentes
tribus ad tribum et
homo de proximo
suo nonne hoc est
quod testabatur no-
bis cum moyses in
profetis qui multa
passus est in aegypto

Tunc reminiscentur
me die illo dicentes
tribus ad tribum et
homo de proximo
suo nonne hoc est
quod testabatur no-
bis cum moyses in
profetis qui multa
passus est in aegypto

IIIF Navigator	IIIF Navigator	IIIF Navigator	IIIF Navigator	IIIF Navigator	IIIF Navigator					IIIF Navigator	IIIF Navigator	IIIF Navigator	IIIF Navigator	IIIF Navigator	IIIF Navigator
8-29-57-113 Jub 19:26-20:1	8-29-57-114 Jub 20:1-5	8-30-58-115 Jub 20:5-9 IIIF Navigator	8-30-58-116 Jub 20:9-21:1 IIIF Navigator	8-31-59-117 Jub 21:1-5 IIIF Navigator	8-31-59-118 Jub 21:6-10 IIIF Navigator	8-32-60-119 Jub 21:10-13	8-32-60-120 Jub 21:13-19	8-32-61-121 Jub 21:19-23	8-32-61-122 Jub 21:23-22:2	8-31-62-123 Jub 22:2-6 IIIF Navigator	8-31-62-124 Jub 22:6-10 IIIF Navigator	8-30-63-125 Jub 22:10-15 IIIF Navigator	8-30-63-126 Jub 22:15-19 IIIF Navigator	8-29-64-127 Jub 22:19-24	8-29-64-128 Jub 22:24-28
9-33-65-129 Jub 22:28-23:3	9-33-65-130 Jub 23:3-8	9-34-66-131 Jub 23:8-12 IIIF Navigator	9-34-66-132 Jub 23:12-16 IIIF Navigator	9-35-67-133 Jub 23:16-19 IIIF Navigator	9-35-67-134 Jub 23:19-23 IIIF Navigator	9-36-68-135 Jub 23:23-27	9-36-68-136 Jub 23:27-32	9-36-69-137 Jub 24:1-6	9-36-69-138 Jub 24:6-12	9-35-70-139 Jub 24:13-18 IIIF Navigator	9-35-70-140 Jub 24:19-23 IIIF Navigator	9-34-71-141 Jub 24:23-29 IIIF Navigator	9-34-71-142 Jub 24:29-25:1 IIIF Navigator	9-33-72-143 Jub 25:1-4	9-33-72-144 Jub 25:5-10
10-37-73-145 Jub 25:11-16	10-37-73-146 Jub 25:16-20	10-38-74-147 Jub 25:20-26:2	10-38-74-148 Jub 26:2-8	10-39-75-149 Jub 26:8-14 IIIF Navigator	10-39-75-150 Jub 26:14-23 IIIF Navigator	10-40-76-151 Jub 26:23-27	10-40-76-152 Jub 26:27-34	10-40-77-153 Jub 26:34-27:6	10-40-77-154 Jub 27:6-11	10-39-78-155 Jub 27:11-19 IIIF Navigator	10-39-78-156 Jub 27:19-24 IIIF Navigator	10-38-79-157 Jub 27:24-27	10-38-79-158 Jub 28:1-6	10-37-80-159 Jub 28:6-10	10-37-80-160 Jub 28:10-16
11-41-81-161 Jub 28:16-22 IIIF Navigator	11-41-81-162 Jub 28:22-27 IIIF Navigator	11-42-82-163 Jub 28:27-29:3	11-42-82-164 Jub 29:3-8	11-43-83-165 Jub 29:8-13 IIIF Navigator	11-43-83-166 Jub 29:13-19 IIIF Navigator	11-44-84-167 Jub 29:19-30:4 IIIF Navigator	11-44-84-168 Jub 30:4-8 IIIF Navigator	11-44-85-169 Jub 30:8-13 IIIF Navigator	11-44-85-170 Jub 30:13-17 IIIF Navigator	11-43-86-171 Jub 30:17-22 IIIF Navigator	11-43-86-172 Jub 30:22-31:1 IIIF Navigator	11-42-87-173 Jub 31:1-5	11-42-87-174 Jub 31:5-9	11-41-88-175 Jub 31:9-15 IIIF Navigator	11-41-88-176 Jub 31:15-18 IIIF Navigator
12-45-89-177 Jub 31:18-23	12-45-89-178 Jub 31:23-29	12-46-90-179 Jub 31:29-32:2 IIIF Navigator	12-46-90-180 Jub 32:3-8 IIIF Navigator	12-47-91-181 Jub 32:8-12	12-47-91-182 Jub 32:12-18	12-48-92-183 Jub 32:18-22 IIIF Navigator	12-48-92-184 Jub 32:22-29 IIIF Navigator	12-48-93-185 Jub 32:29-33:1 IIIF Navigator	12-48-93-186 Jub 33:1-9 IIIF Navigator	12-47-94-187 Jub 33:9-13	12-47-94-188 Jub 33:13-18	12-46-95-189 Jub 33:18-23 IIIF Navigator	12-46-95-190 Jub 33:23-34:5 IIIF Navigator	12-45-96-191 Jub 34:5-11	12-45-96-192 Jub 34:11-16
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FLUENT IO EST PPECATIS
RITATE CONCURRUNT. HINC
CURSUS EST IN SERENO



... *etiam* ...
... *etiam* ...

... *etiam* ...
... *etiam* ...

... *etiam* ...
... *etiam* ...

... *etiam* ...
... *etiam* ...

... *etiam* ...
... *etiam* ...

... *etiam* ...
... *etiam* ...



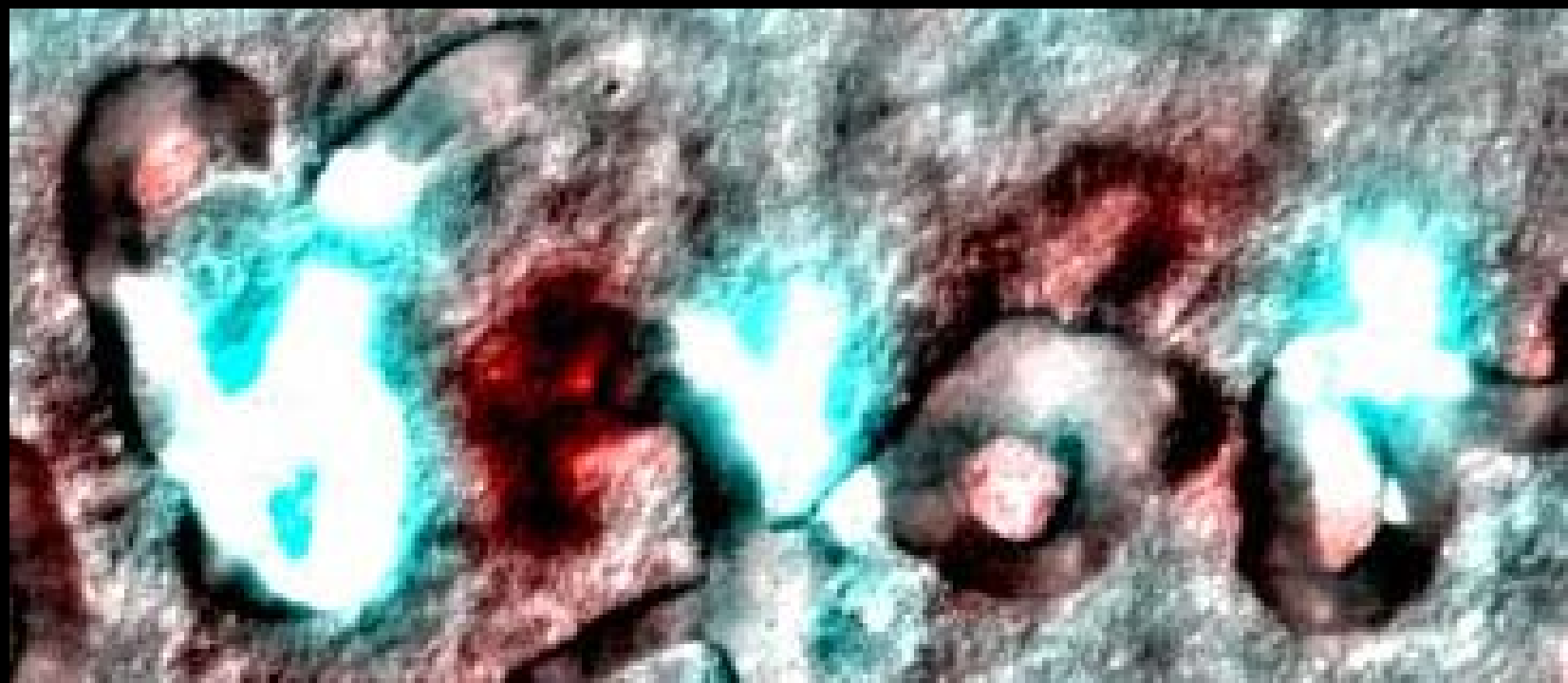
εφωτίζει τα σωματῶν τῶν
 καὶ ἐφωτίζει τὴν ψυχὴν
 τοῦ ἀνθρώπου. ἡ ἀνθρωπινὴ
 φύσις ἄρα καὶ ἡ σωματικὴ
 καὶ ἡ νοητικὴ ἵκναιτο
 ἐν τοῦ ἀποστόλου φερόμενῶν
 ἡμετέροις ἀποστόλοις.



εἶλετο ἡμετέροις ἀποστόλοις
 τὴν ἀνθρωπινὴν καὶ τὴν
 νοητικὴν φύσιν τῶν ἀνθρώπων
 καὶ τὴν σωματικὴν ἵκναιτο

Handwritten initials or mark.

ὅτι καὶ ἡ σωματικὴ καὶ ἡ
 νοητικὴ φύσις τῶν ἀνθρώπων
 ἵκναιτο ἐν τοῦ ἀποστόλου
 φερόμενῶν ἡμετέροις ἀποστόλοις.
 ἡ ἀνθρωπινὴ φύσις ἄρα καὶ ἡ
 σωματικὴ καὶ ἡ νοητικὴ ἵκναιτο
 ἐν τοῦ ἀποστόλου φερόμενῶν
 ἡμετέροις ἀποστόλοις.



Handwritten text in a cursive script on aged, yellowish paper. The characters are dark brown and appear to be a form of shorthand or a specific dialect. The visible characters include a circular symbol, a vertical stroke with a hook, a vertical stroke with a loop, a vertical stroke with a crossbar, and a vertical stroke with a hook.

Handwritten text in a cursive script on a red and white checkered background. The characters are black and appear to be a form of shorthand or a specific dialect. The visible characters include a circular symbol, a vertical stroke with a hook, a vertical stroke with a loop, a vertical stroke with a crossbar, and a vertical stroke with a hook.

1072 Gouu on Jhooo
m. Godesod quobas
odre Gouu ralfadt

1072 Gouu on Jhooo
m. Godesod quobas
odre Gouu ralfadt

1072 Gouu on Jhooo
m. Godesod quobas
odre Gouu ralfadt

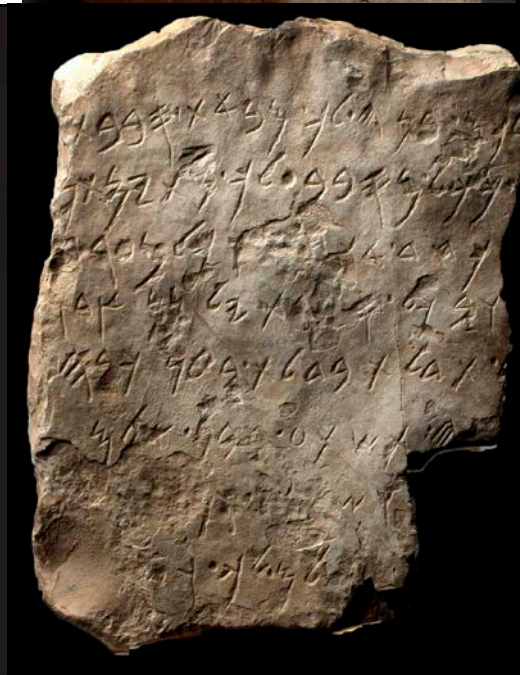
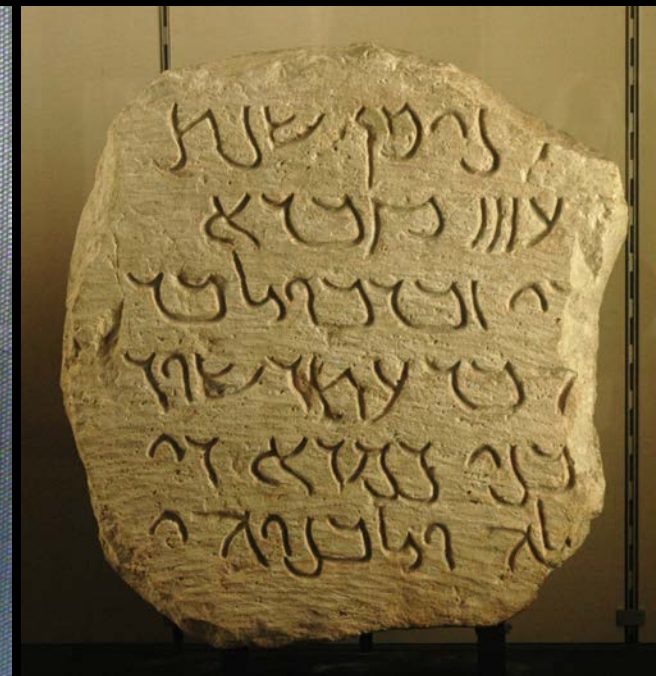


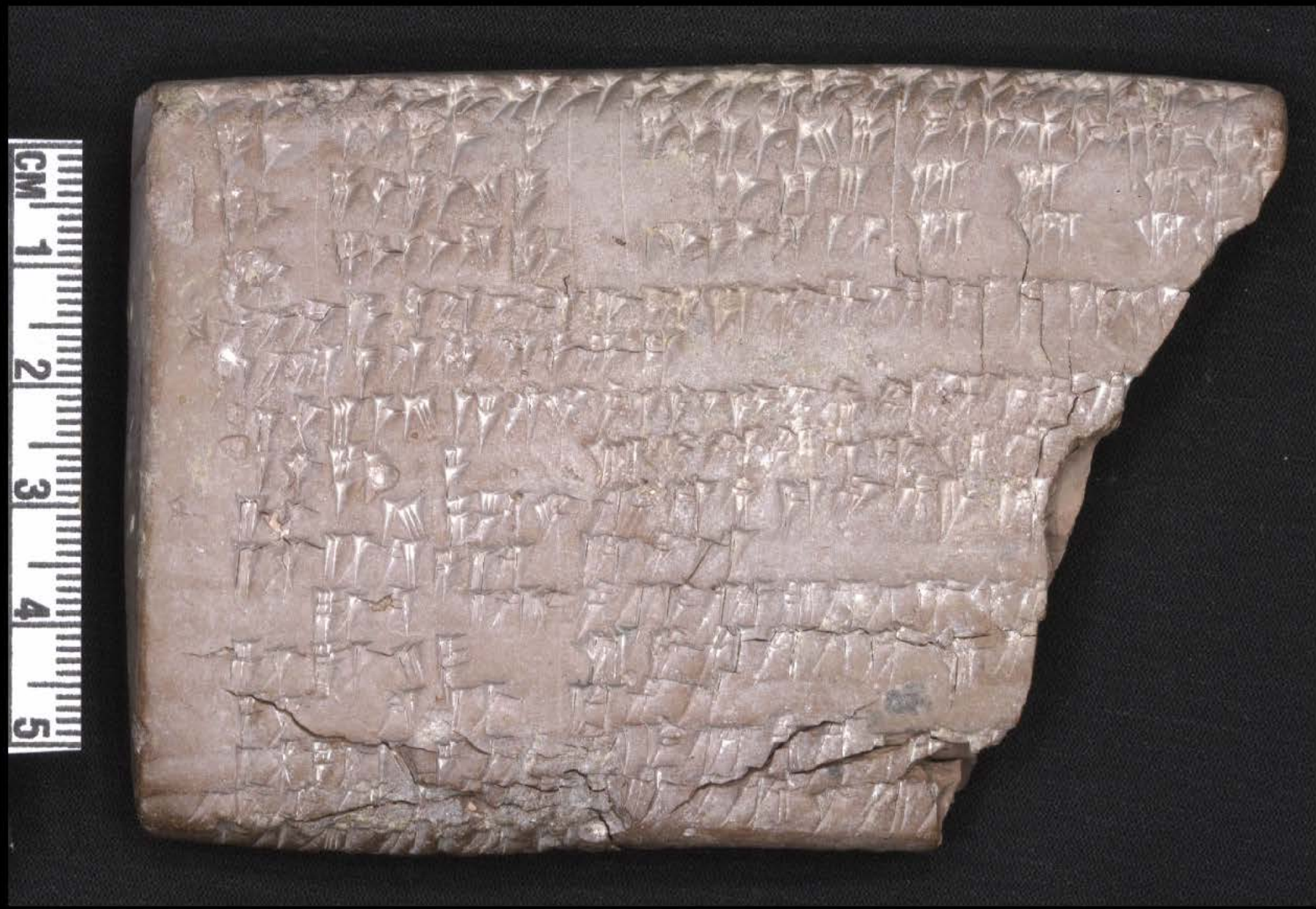
Ytū p̄lānos tellūs alīs alīs p̄ctas!
S̄i rēi ḡrcoꝝ rēdit hīc a t̄nḡḡr mētās.

Sentus aldo in regens archana marone,
ut putant dūchy postorib; atq; colonis.



PSALMUS
HIS A RAB
120-130
136





RTI Zoom is: 45 %

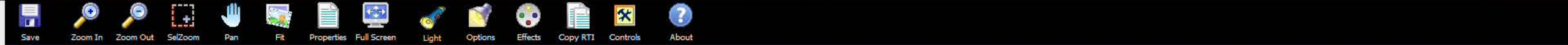
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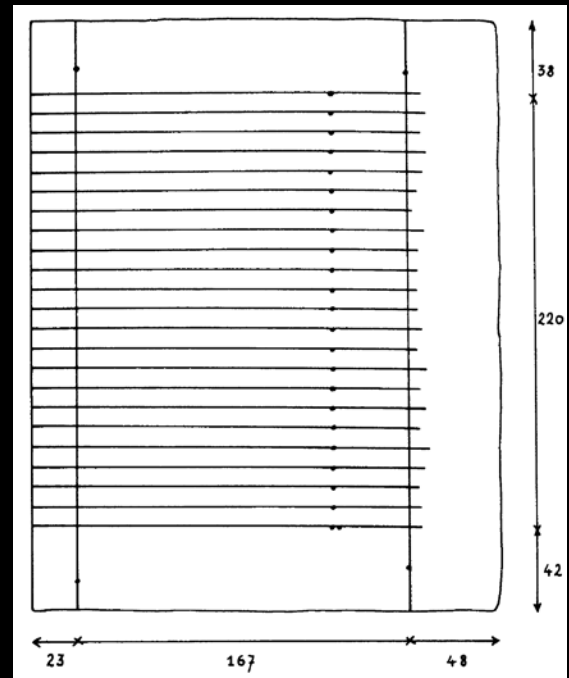
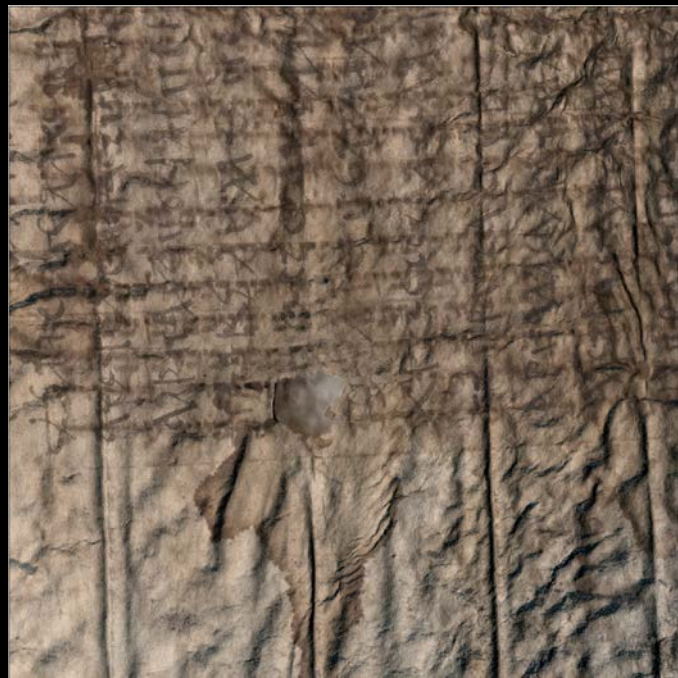
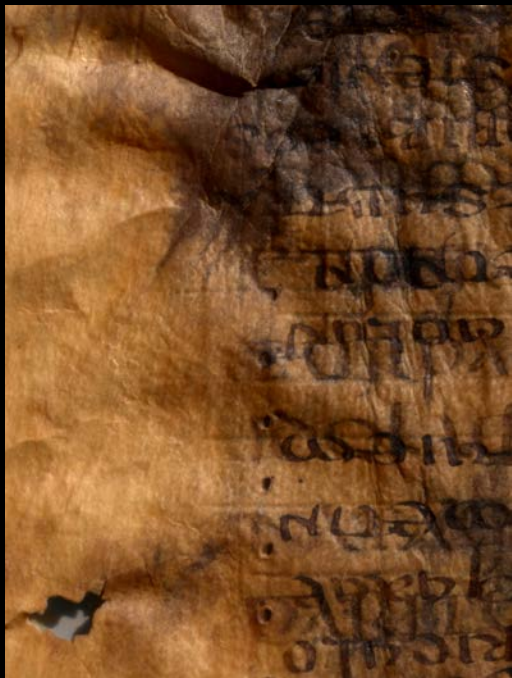
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Thumbnail

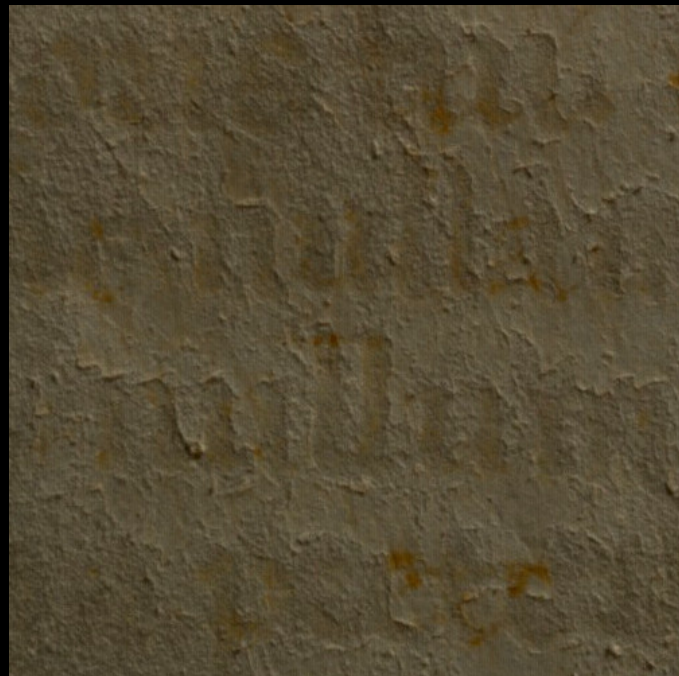
Move cursor in the selected image or in the thumbnail above to move the light around in the image.

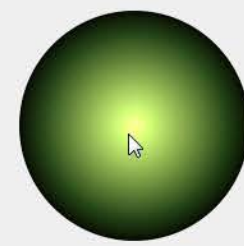
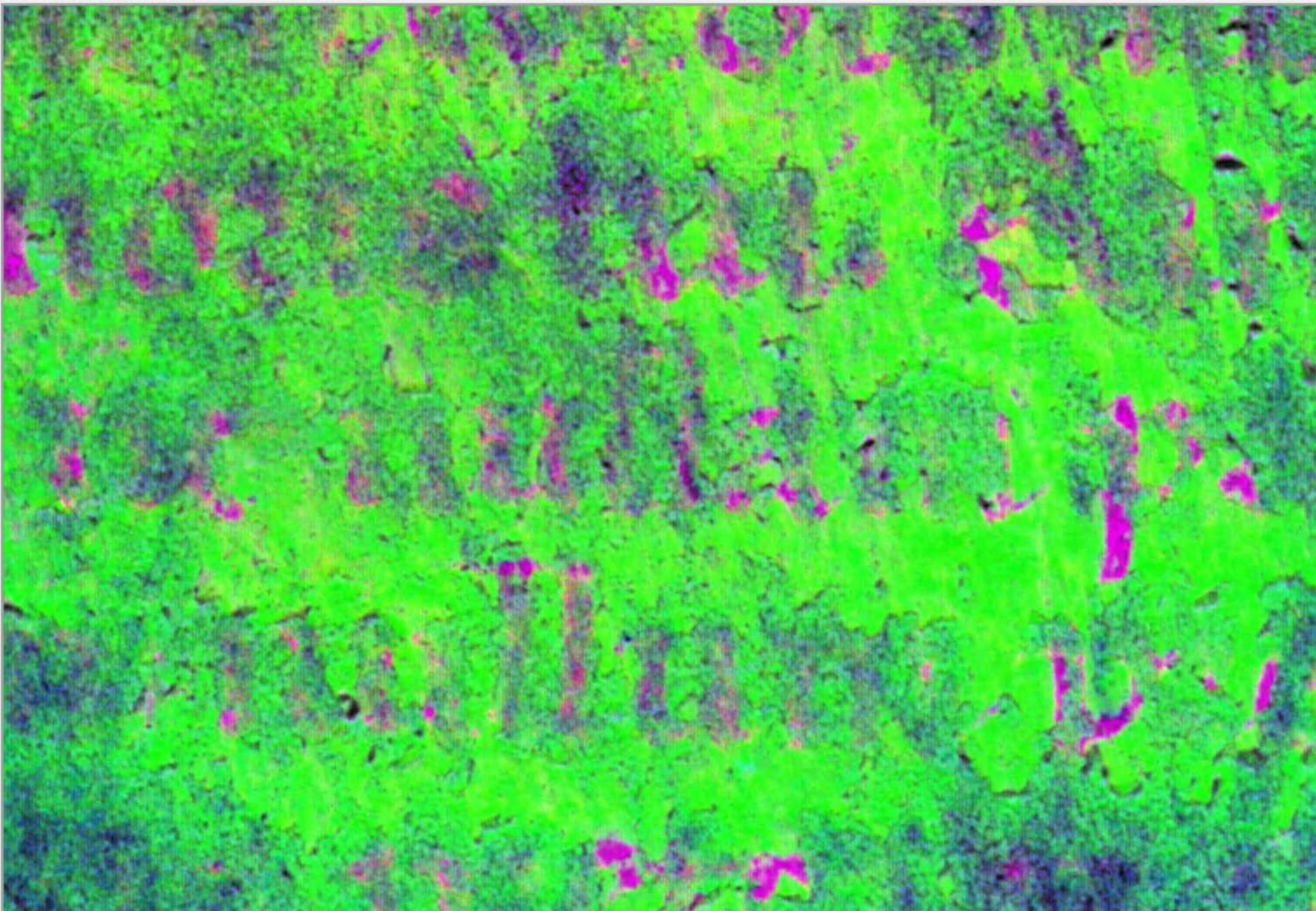


RTI Zoom is: 45 %



rum malitiosos
quoniam est in no
m[in]isteria
betideant ver
scio quod ad
rum es ite su
monitione quib





Light
x 0.00
y 0.00
Zoom
200%
Pan
x 863
y 2359

Rendering mode
Default

Navigator Bookmarks
File DataArchive\Pal1\Pepl\20140415-Pal1-99-Pepl-04-50m-yccf01.ptm
Size 2376 x 3040 Format LRGB PTM



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Resources and Links

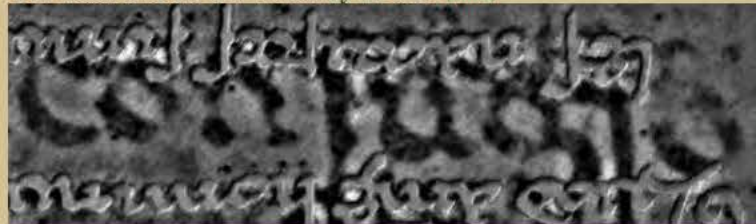
- About Digital Archaeology (LINK)
- About the Jubilees Palimpsest (LINK)
- About web dissemination and accessibility (LINK)
- About RTI (LINK)
- About spectral imaging (LINK)
- People (LINK)

News

- November 8, 2017 - **Public Presentations** - Project Director Todd Hanneken will be presenting on the Jubilees Palimpsest Project on November 9 at the University of Texas, Austin ([announcement](#), [slides](#)) and on November 20 at the Society of Biblical Literature annual meeting in Boston ([sbl-site.org online program book](#)).
- August 17, 2017 - **Sample pages from fourth-century Gothic Bible** - Twenty pages of Ambrosiana S36sup have been added to the repository. Basic processed images are available now, and advanced images will be added over the coming weeks. The sample pages are from Paul's letters, and also include a liturgical calendar. The translator is the Arian bishop Wulfila. See further [Wikipedia.org](#) and the image repository (LINK).



- August 4, 2017 - **Sample pages from an unidentified palimpsest** - Seven pages of Ambrosiana H190inf have been added to the repository. The undertext has not yet been identified. Advanced imaging makes at least some parts reasonably legible. Who wants to be the first to identify the text? (LINK)





















- July 6, 2017 - **Sample pages from Origen's Hexapla** - Five folios (ten pages) added to the repository with diffuse, raking light, and WebRTI lighting for color processes



International Image Interoperability Framework™
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Close

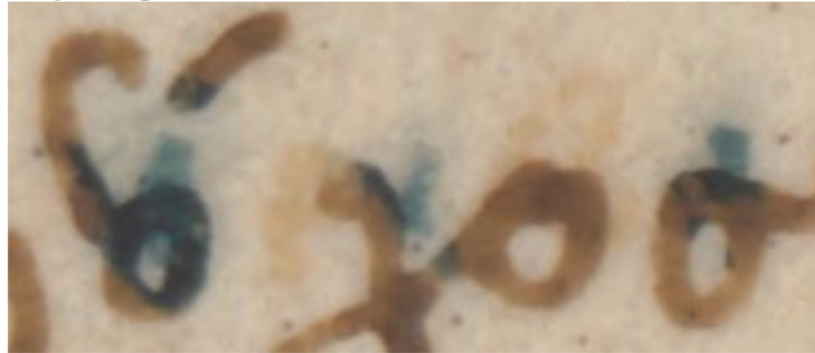
Filter objects: Add new object from URL: Load

- 
 rois de France et d'Angleterre, jusqu'à l'an 1461: manuscript, [ca. 1461]. MS Typ 41.
 Harvard University 41 items
 
- 
 Catholic Church. Homiliarium. Homiliary including works of Bede, Augustine, and Gregory: manuscript, [11--]. MS Typ 441.
 Harvard University 40 items
 
- 
 Poems by Guillaume de Machaut, [15 cent.]
 National Library of Wales 178 items
 
- 
 The clans of the Scottish Highlands
 Stanford University 360 items
 
- 
 City of Dublin : sheet 21
 University College Dublin 1 item
 
- 
 Housing Plans for Greater Dublin
 University College Dublin 1 item
 
- 
 A group of Irish Free State Army soldiers firing artillery on the Four Courts
 University College Dublin 1 item
 
- 
 Aa, Admont, Benediktinerstift Admont Bibliothek & Museum, Admont MS 23
 Yale University 592 items
 
- 
 大正新脩大藏經圖像部第12b02卷
 University of Tokyo 1 item
 

In most cases Mercati swabbed the tincture over an entire area where a letter or word might be. In some cases he drew fine lines which can be mistaken for original ink strokes. The processed images excel at making similar materials look similar and different materials look different. For example, on page 81 in the NAP02 color processing, tincture appears light blue and erased text as dark red. In the letters $\sigma\epsilon$ in this image (



)the erased text is visible along with the reagent. However, elsewhere on the same page, where Mercati reads $\iota\rho\iota\beta\iota$, the iotas appear only in light blue and not at all in dark red (

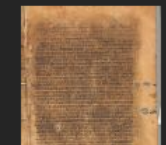


). The raking light images show the rule lines, so it is certain a letter was there and likely that a iota is the best fit, but any trace of the original ink has been destroyed and the visible marking in the shape of a letter iota is entirely the result of Mercati "writing" with tincture and not evidence of an original letter.

Ambrosiana_C73inf (Latin Moses)

Reconstruction of the Fifth Century Codex of Mosaic Books in Latin (Jubilees and Testament of Moses)

Ordered in sequence of Fifth Century Codex



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Image cube contains:

1. Accurate Color Diffuse (http://jubilees.stmarytx.edu/iifp/Ambrosiana_C73inf_062_Ac_00.jp2) [Crop Resize](#)
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4. Accurate Color Raking SW (http://jubilees.stmarytx.edu/iifp/Ambrosiana_C73inf_062_Ac_07.jp2) [Crop Resize](#)
5. Accurate Color Raking NW (http://jubilees.stmarytx.edu/iifp/Ambrosiana_C73inf_062_Ac_02.jp2) [Crop Resize](#)
6. Accurate Color Transmissive (http://jubilees.stmarytx.edu/iifp/Ambrosiana_C73inf_062_Ac_Tx.jp2) [Crop Resize](#)
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8. Extended Spectrum Raking NE (http://jubilees.stmarytx.edu/iifp/Ambrosiana_C73inf_062_Xs_51.jp2) [Crop Resize](#)
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13. KTK Ruby Diffuse (http://jubilees.stmarytx.edu/iifp/Ambrosiana_C73inf_062_KTK01_00.jp2) [Crop Resize](#)
14. KTK Ruby Raking NE (http://jubilees.stmarytx.edu/iifp/Ambrosiana_C73inf_062_KTK01_51.jp2) [Crop Resize](#)
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18. KTK Ruby Transmissive (http://jubilees.stmarytx.edu/iifp/Ambrosiana_C73inf_062_KTK01_Tx.jp2) [Crop Resize](#)
19. Microfilm (http://jubilees.stmarytx.edu/iifp/Ambrosiana_C73inf_062_microfilm.jp2) [Crop Resize](#)
20. Ceriani1861 (<http://jubilees.stmarytx.edu/iifp/Ceriani1861-15.jp2>) [Crop Resize](#)

Additional content in <http://jubilees.stmarytx.edu/iifp/LatinMoses/list/5c083.json>

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3. KTK Ruby

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3. [Translation Latest](#)
4. [Translation VanderKam 1989 \(Latin\)](#)
5. [Translation VanderKam 1989 \(Ethiopic\)](#)

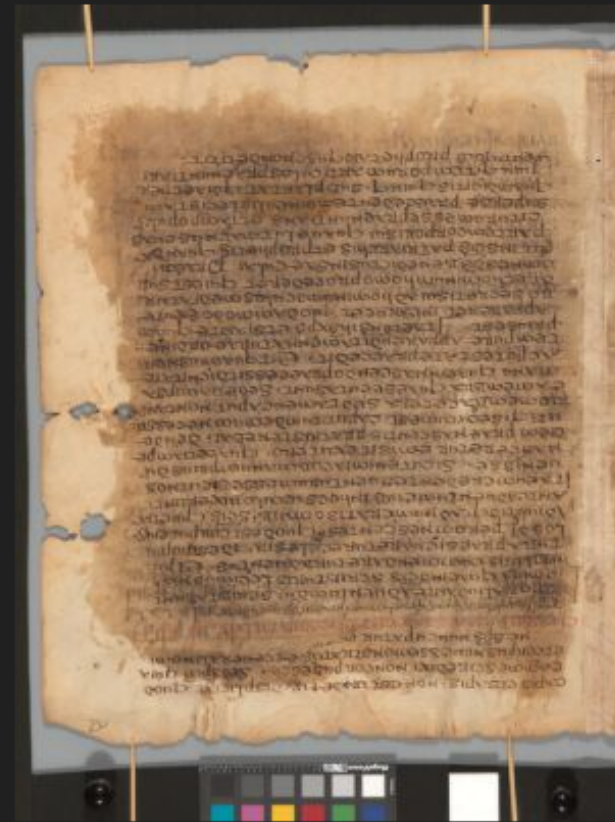


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17. KTK Ruby Raking NW
18. KTK Ruby Transmissive
19. Microfilm
20. Ceriani1861

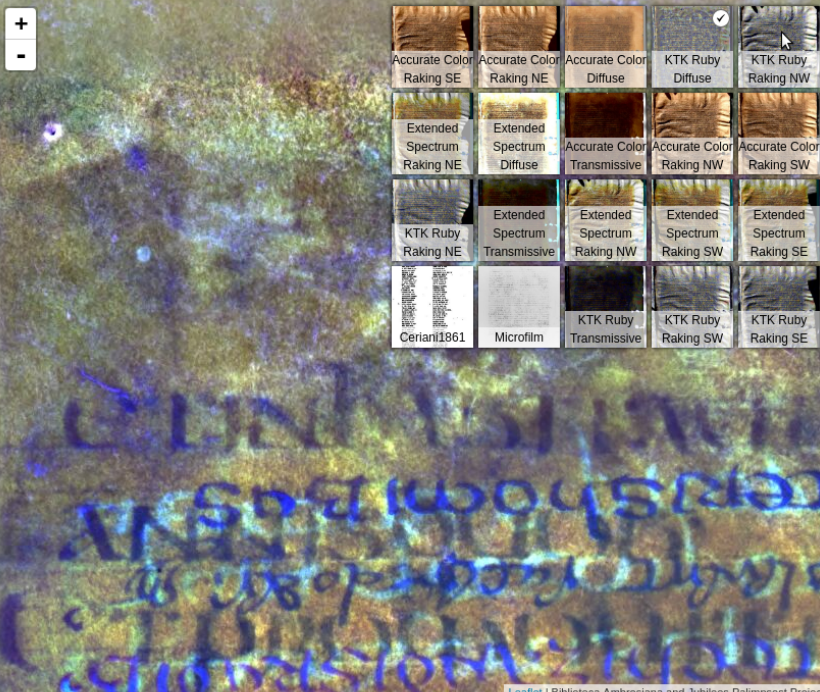
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1. Accurate Color
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Transcriptions and Translations:

1. Transcription Latest
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3. Translation Latest
4. Translation VanderKam 1989 (Latin)
5. Translation VanderKam 1989 (Ethiopic)

Leaflet with Image Cube from Manifest Coordinates



Grid of image cube options:

Accurate Color Raking SE	Accurate Color Raking NE	Accurate Color Diffuse	KTK Ruby Diffuse	KTK Ruby Raking NW
Extended Spectrum Raking NE	Extended Spectrum Diffuse	Accurate Color Transmissive	Accurate Color Raking NW	Accurate Color Raking SW
KTK Ruby Raking NE	Extended Spectrum Transmissive	Extended Spectrum Raking NW	Extended Spectrum Raking SW	Extended Spectrum Raking SE
Ceriani1861	Microfilm	KTK Ruby Transmissive	KTK Ruby Raking SW	KTK Ruby Raking SE

Leaflet | Biblioteca Ambrosiana and Jubilees Palimpsest Project

Latin Moses (Jubilees and Testament of Moses), The Jubilees Palimpsest Project

Latin Moses (Jubilees and Testament of Moses)

Ancient page 083 (=modern page number 062)

col. a	col. b
Et inhabitauit illic	saram uxorem abram.
annis duobus.	Et tunc abram glorificauit
Et promouit inde	diuitiis ualde
in austrum usque bahalot	omnibus ouibus et
halot et facta est	ubus et asinis et
famis super terram.	camelis et equis et
Et abiit abram in aegyptum	seruis et ancillis
anno tertio	argento et aro ualde.
septimani et inhabitauit	Etenim et loth
in terram	filio fratris sui erant
aegypti quinque annis	diuitiis. Et reddidit
priusquam raperetur	farao saram
uxor ipsius ab eo.	uxorem abram uiro
Et tunc abiit cum	uxore et iocit cum

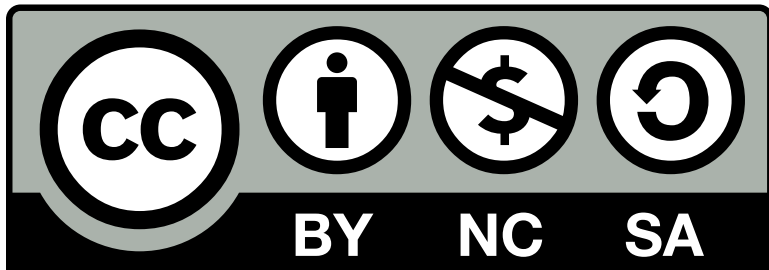
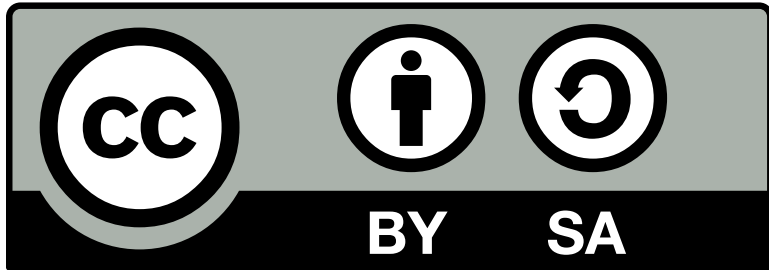
Translation of Latin Moses - Chromium

Translation of Latin Moses

13:10 ... 5c083 he stayed there for two years. Then he went to the southern territory as far as Bahalot. There was a famine in the land. 13:11 So Abram went to Egypt in the third year of the week. He lived in the land of Egypt for five years before his wife was taken from him by force. 13:12 Tanais, the Egyptian city, was built at that time — seven years after Hebron. 13:13 When the pharaoh took Abram's wife Sarah by force, the Lord punished the pharaoh and his household very severely because of Abram's wife Sarah. 13:14 At that time he made Abram extremely wealthy with all (kinds of) sheep, cattle, donkeys, camels, horses, male and female servants, silver and very (much) gold. Lot — his brother's son — was also wealthy. 13:15 The pharaoh returned Abram's wife Sarah to her husband and expelled him from the land of Egypt. He went to the place where he had first pitched his tent — at the location of the altar, with Ai on the east side and Bethel on the west. He blessed the Lord his God who had brought him back safely. 13:16 5c084 During the forty-first jubilee, in the third year of the first week, he returned to this place. He offered sacrifices and called on the Lord's name: 'You, most high God, are my God forever and ever'.

13:17 In the fourth year of this week Lot separated from him. He settled in Sodom. Now the Sodomite people were very sinful. 13:18 They were evil in their hearts that Lot, his brother's son, had separated from him for he had no children. 13:19 Lot was taken captive from him. But in the fourth year of this week — of the same jubilee — God said to Abram: 'Look up from where you are staying toward the west, the south, the east, and the north; 13:20 because all the land which you see I will give to you and your descendants forever. I will make your descendants like the sands of the sea, for your descendants will not be counted. 13:21 Now you — get up and walk its width. Look at everything because I will give it to your descendants'. Then Abram went to Hebron and lived ...

15:20 5c093 ... him, make him numerous, and increase him very much. For he will father 12 princes, and I will make him into a larger nation. 15:21 But my covenant I will establish with Isaac whom Sarah will bear for you at this time next year'. 15:22 When he had finished speaking with him, God ascended from Abraham.



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Jubilees Palimpsest Project

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Ambrosiana_H190inf

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Ambrosiana_F130sup (Greek Commentary on Luke)

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Images from the Integrating phase of the Jubilees Palimpsest Project

Jubilees Palimpsest Project

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Ambrosiana_C73inf (Latin Moses)

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Ambrosiana_C73inf (Arian Commentary on Luke)

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Ambrosiana_S36sup

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Ambrosiana_O39sup (Origen Hexapla)

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Ambrosiana_A79inf (Petrarch's Virgil)



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/AmbrosianaArchive/Ambrosiana_C73inf/Ambrosiana_C73inf_001

<u>Name</u>	<u>Last modified</u>	<u>Size</u>	<u>Description</u>
Parent Directory		-	
AccurateColor/	26-Jan-2017 02:37	-	
AccurateColorRTI/	16-Feb-2017 11:41	-	
Ambrosiana_C73inf_001_CaptureMetadata.xml	24-Aug-2017 13:20	256K	
Captures-Fluorescence-Gamma/	26-Jan-2017 02:37	-	
Captures-Fluorescence-NoGamma/	26-Jan-2017 02:08	-	
Captures-Hemisphere-Gamma/	26-Jan-2017 02:37	-	
Captures-Hemisphere-NoGamma/	26-Jan-2017 02:07	-	
Captures-Narrowband-Gamma/	26-Jan-2017 02:37	-	
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ExtendedSpectrumRTI/	16-Feb-2017 11:41	-	
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Process Spectral RTI Images in ImageJ Edit

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38 commits 1 branch 0 releases 1 contributor GPL-3.0

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thanneken Add files via upload Latest commit e328c23 on Jul 31

Guide	Add files via upload	3 months ago
LICENSE	Initial commit	a year ago
PCA_class	Principal Component Analysis Plugin	a year ago
README.md	January 24, 2017 update	10 months ago
SpectralRTI_Dataset.bash	Capture folders now specify Gamma or NoGamma	8 months ago
SpectralRTI_Toolkit.ijm	Update SpectralRTI_Toolkit.ijm	4 months ago
Stack_Manipulation-2.0.1.zip	Required "Slice Keeper" function, included in Fiji	4 months ago
bij_plugin.zip	Biomedical Imaging in Java	4 months ago
ijp-toolkit_bin_2.1.0.zip	http://ij-plugins.sourceforge.net/plugins/color/	8 months ago

README.md

SpectralRTI_Toolkit

ImageJ

Image Processing and Analysis in Java

Process Spectral RTI Images in ImageJ

The toolkit processes the data from a Spectral RTI capture session. This data includes diffuse narrowband spectral images, monochrome RTI captures from 35 or more light positions, and an accurate color image. The toolkit guides processing of the light position (lp) file, and outputs to HSH RTI, PTM, and WebRTI formats. The base color processing options are Accurate Color, Extended Spectrum, and PCA Pseudocolor. The Toolkit is intended to be usable by general users without requiring any editing of text files, command line arguments, or regular expressions. For more information about Spectral RTI see

Guide to Creating Spectral RTI Images

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THE JUBILEES PALIMPSEST PROJECT

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