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Applying DCMI Elements to Digital Images and Text in the Archimedes Palimpsest Program

Michael B. Toth
R. B. Toth Associates

Doug Emery
Emery IT

On behalf of the Project Team, especially:
Will Noel & Abigail Quandt, Walters Art Museum
Bill Christens-Barry, Equipoise Imaging, LLC
Roger Easton, Jr., Rochester Institute of Technology
Keith Knox, Boeing LTS, Inc.
with special thanks to the Owner

October 29, 1998



Photographs by Michelle V. Agins/The New York Times

The oldest surviving copy of important mathematical works of Archimedes was sold at auction in New York.

Archimedes Text Sold for \$2 Million

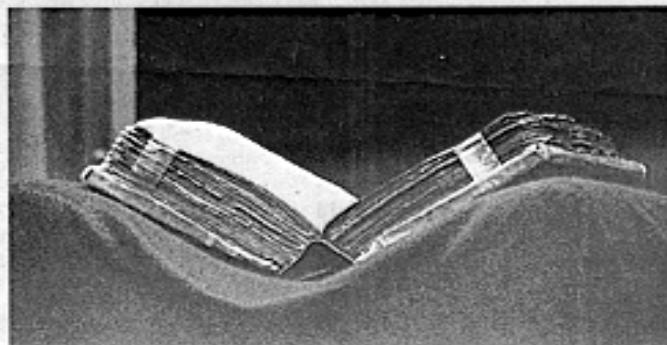
By MALCOLM W. BROWNE

A scorched and moldy volume of thousand-year-old pages — the oldest surviving copy of important mathematical works of Archimedes — was sold at auction yesterday for \$2 million, double the expected price.

The winning bid, at Christie's of New York City, was made by Simon Finch, a London book dealer, who said he had acted on behalf of an unidentified private American collector. The seller was identified only as a French family that acquired the volume in the early 1920's.

The volume includes copies of two of Archimedes' greatest works: "Method of Mechanical Theorems," which includes ideas startlingly reminiscent of modern calculus, and "On Floating Bodies," which puts forth his laws of flotation.

They are in palimpsest form: that is, the original inked copy of Archimedes' texts, written by a 10th-century scribe, was washed off by Byzantine monks in the 13th century so that the expensive vellum on which it was written could be reused. The Archimedes text was made almost illegible by the washing and then covered by the later religious text.



Ownership of the Archimedes manuscript is being contested, by the Greek Orthodox Patriarch of Jerusalem on grounds that it was stolen.

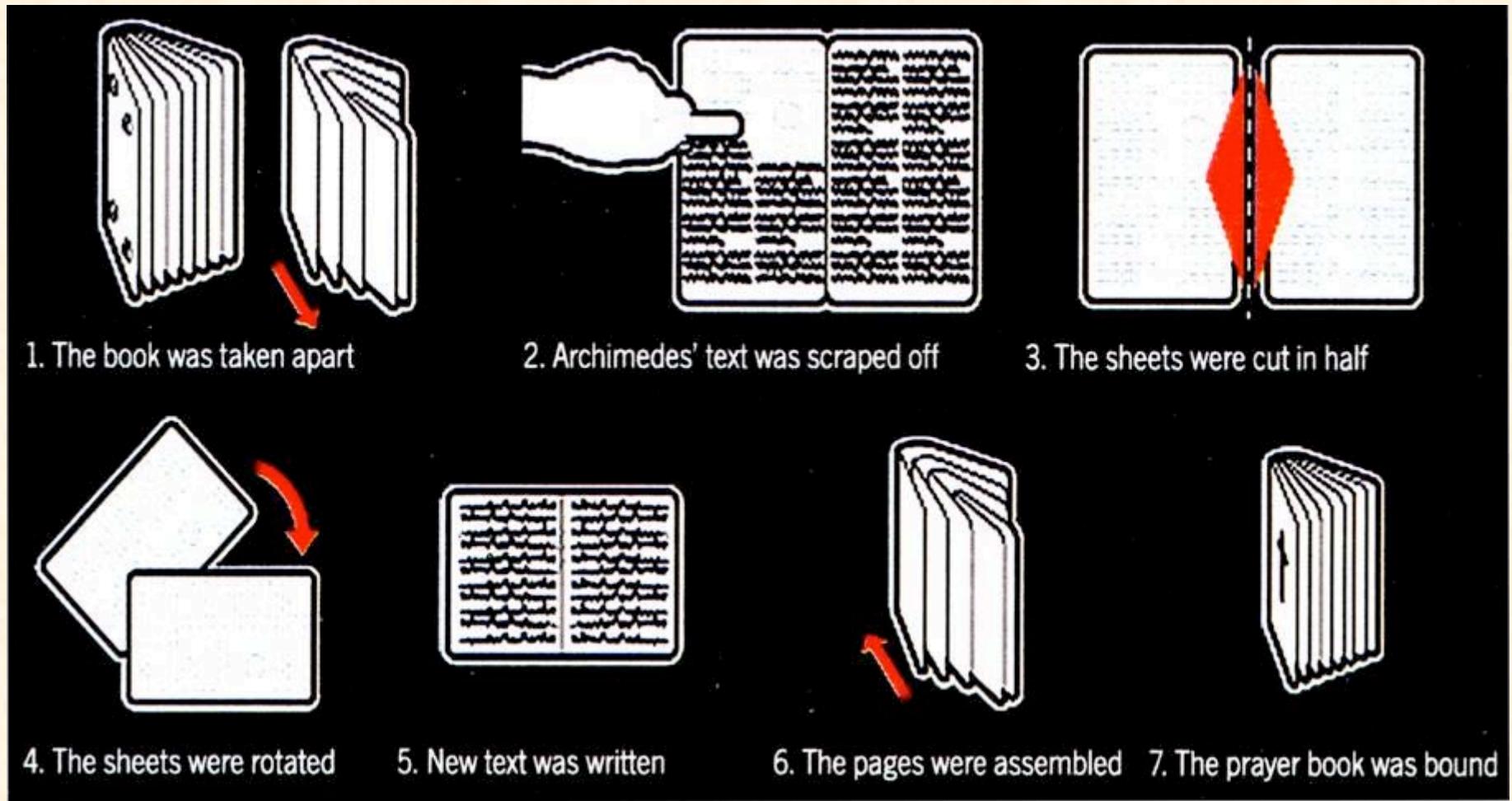
**A reported pledge
not to limit access
to an ancient
manuscript.**

scholars who could mine its riches."

But Felix de Maraz Oyens, a Christie's expert on ancient manuscripts, offered some consolation. Mr. de Maraz Oyens, who knows the identity of both the seller and buyer, predicted that scholars would be given access to the work.

"The buyer told me he would allow

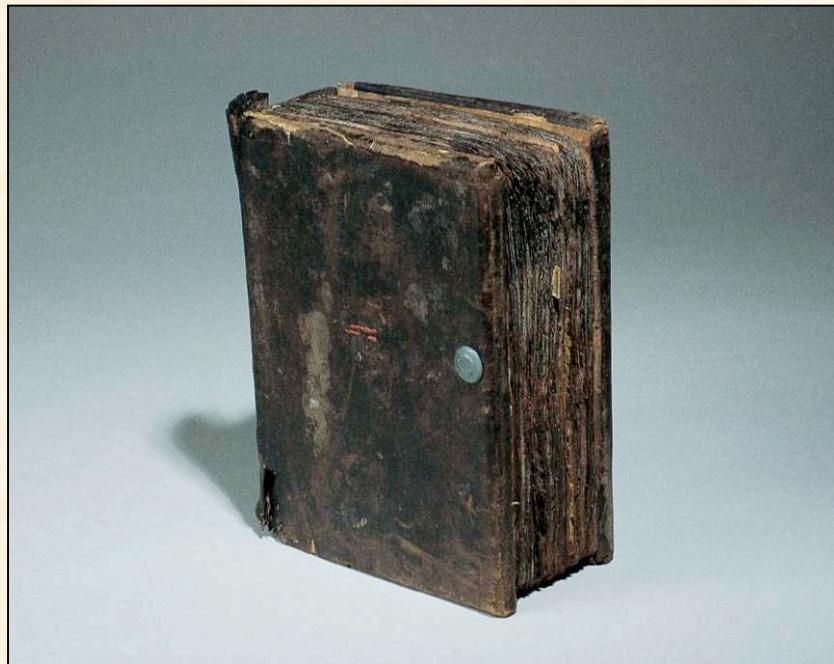
Creation of the Palimpsest



<http://www.sunday-times.co.uk/>

Parchment Manuscript

1998



Digital Product 2008

www.archimedespalimpsest.net

The screenshot shows a Mozilla Firefox window with two tabs open. The left tab displays the homepage of 'THE ARCHIMEDES PALIMPSEST'. The homepage features a dark blue sidebar on the left with white text links: 'The Palimpsest', 'Conservation', 'Imaging', 'Scholarship', 'Program Management', 'Digital Palimpsest', 'Image Bank', and 'Archimedes Forum'. The main content area has a red header with the text 'THE ARCHIMEDES PALIMPSEST' and a 'Beta Release' section below it. The right tab shows the XML schema 'ddterms.xsd' for DC elements. The XML code is as follows:

```
<?xml version="1.0" encoding="UTF-8"?>
<xss:schema xmlns:xss="http://www.w3.org/2001/XMLSchema"
  xmlns:dc="http://purl.org/dc/elements/1.1/"
  xmlns:dcType="http://purl.org/dc/dcmitype/"
  targetNamespace="http://purl.org/dc/terms/"
  xmlns="http://purl.org/dc/terms/"
  elementFormDefault="qualified"
  attributeFormDefault="unqualified">
```

Below the XML code, there is a note about the schema's purpose and its reuse of the 'dc:SimpleLiteral' type from the 'dc.xsd' schema.

All Archimedes Palimpsest Images
© Copyright Owner of the Archimedes Palimpsest
Licensed for use under Creative Commons
Attribution 3.0 Unported Access Rights

16 τὰ κατὰ τὰν ΞΟ περιφέρειαν

Ink to Digits to ???

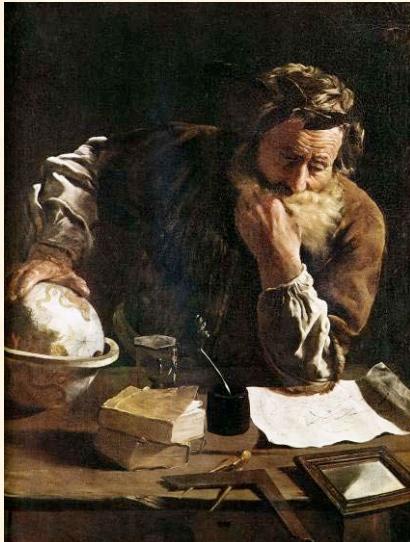
“There’s a big technical issue that has me worried. The information on the Net is not all simple text. It’s structured, whether it’s Microsoft Word documents or PDFs. That means the information is only really accessible if you understand how to interpret the bits. **What happens when files are there and we don’t know how to interpret them anymore?**

“If you have a CD but the form isn’t known anymore. I have 5 1/4-in. diskettes, but nothing to read them. Even 3 1/2-in. diskette readers are becoming hard to come by. The physical source media change. **We may lose the ability to read them.** People forget what they stored on the Net. We can’t necessarily guarantee people will upgrade instances of things.”

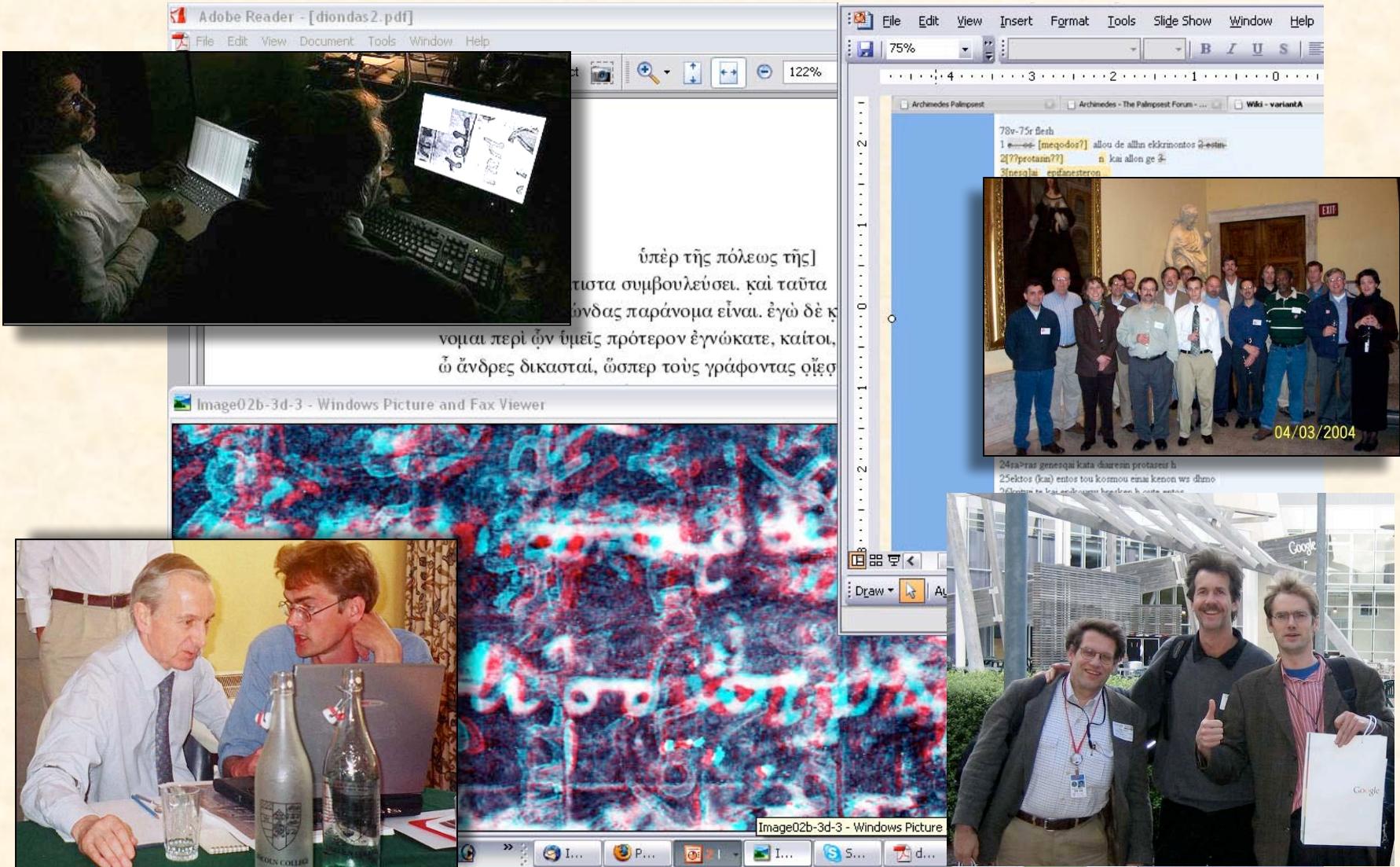
Vint Cerf, Google Internet Evangelist, recipient of Presidential Medal of Freedom, and co-designer of TCP/IP protocols and the basic architecture of the Internet. July 30, 2007 (Computerworld)

Manuscript Studies

20th Century and prior



Manuscript Studies 21st Century



Manuscript Scholarship

Ink to Digits

ΛΟΤΙ ΤΑΝ Η ΕΣΤΩ
Ο ΑΥΤΟ ΟΙΣΟΥΝΤΑΙ Ε

```
<document>
- <column label="H01">
  ff 137 v -
  1 σια τῶν
  2 τοὺς εἰ.
  3 πλευτῶν
  4 πρὸ τοῦ
  5 νον(τοῦ) >(σ)
  6 νεοφύοις
  7 ΕΠΙΛΙΓΕΙΑ
  8 δουνα το
  9 στηλήν
  10 επιλεγόμενο
  11 πολεκεῖν
  12 τε τις
  13 Σωρέας
  14 εστίν Π.ρ.
  15 ΕΠΙΛΙΓΕΙΑ
  16 λαπιστούς ϕαίνεται
  17 ειδηθε ἐν τοις

</column>
- <column label="H02">
```

The Digital Artifact

Preservation Heresy:

**The Digital information is closer to the original
than the Artifact itself**

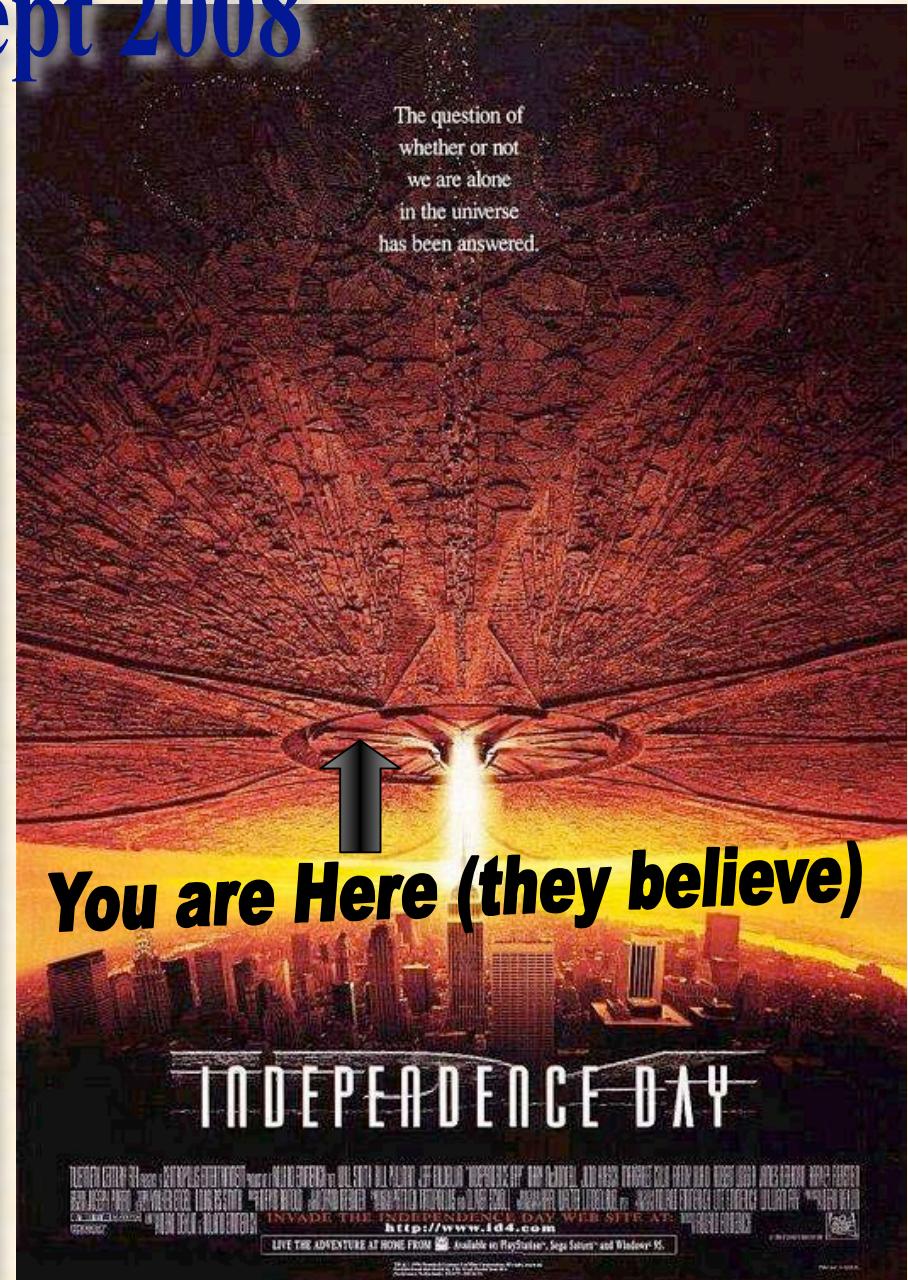


“I don’t use the parchment. The parchment is gone! As far as the scholars are concerned, there is no parchment. You only work from digital images on the laptop – that’s the only thing that matters for the reading.” – Dr. Reviel Netz, 14 Jan WYPR

Google TechTalk, 8 Sept 2008

The long-dormant in what we thought of as mass-digitization projects of the 1990s exploded into something an order of magnitude larger with the arrival of the Google Print project in 2004, and its sequelae, the Open Content Alliance, and Microsoft's Windows Live Book Search, all of which remind us as well of the antecedent Project Gutenberg. Those projects hover like the visiting alien ships in *Independence Day* over a mass of other smaller projects, many of which have critical scholarly value. We are now either at or very close to the point, however, where the body of originally analogue material now in digital form is of such quantity and quality that we must facilitate the operationalization of broad-scale distributed digital libraries. Looking closely at the quality and functionality of these projects for scholarly users is vital to making sure that operationalization supports these vital social uses, ones that Google and others are not likely to have as first priority.

– Council on Library and Information Resources, *When mass digitization reaches critical mass: Scholars' evaluation and analysis of major digitization projects*



Imaging Program Standards

Archimedes Palimpsest - Mozilla Firefox

File Edit View Go Bookmarks Tools Help

http://www.archimedespalimpsest.org/programmanage_documents.html

THE ARCHIMEDES PALIMPSEST

PROGRAM DOCUMENTATION

Archimedes Palimpsest Metadata Standard

Digital imaging of the Archimedes Palimpsest has offered a complex set of metadata challenges. The thousand-year-old manuscript is yielding a large and rich volume of data. The Archimedes Palimpsest team has developed the Archimedes Palimpsest Metadata Standard, using the Dublin Core Metadata Element Set as the basis for the core identification metadata. Spatial metadata needed to support a complex range of imagery data has also required the integration of metadata standards based on those originally developed for geospatial imaging from space. The result is a unique manuscript imaging metadata standard to support digital "scriptspatial" data accessible by a range of users from storage devices or the web.

[Click here](#) to view the Metadata Standard
[Click here](#) to view the Metadata Standard
[Click here](#) to view the Metadata Standard
[Click here](#) to contact us with comments.

Archimedes Palimpsest Transcription

The annotations of the Archimedes Palimpsest are currently in the process of being integrated with the transcriptions. This will facilitate the integration of the transcriptions with the images, and will be revised based on lessons learned.

[Click here](#) to see the Transcription Annotations
[Click here](#) to see the Transcription Annotations
[Click here](#) to see the Transcription Metadata
[Click here](#) to contact us with comments.

Archimedes Palimpsest Metadata

The X-Ray Florescence (XRF) imaging study is currently underway to determine the elemental composition of different imaging techniques.

archimedes_metadatastandard1-02.pdf (application/pdf Object) - Mozilla Firefox

File Edit View Go Bookmarks Tools Help

71%

Archimedes Palimpsest Metadata Standard 1.0
7 June 2006
Revision 5

INTRODUCTION

1. Objectives. This standard is intended to provide a common set of terminology and definitions for the archival documentation of digital multispectral imagery data used in the study of the manuscript titled: *The Archimedes Palimpsest*. This standard establishes the names and definitions of data elements, specifies the types and ranges of values these elements may contain, and defines requirements for the entry of metadata for these elements.

The primary uses of this metadata are to:

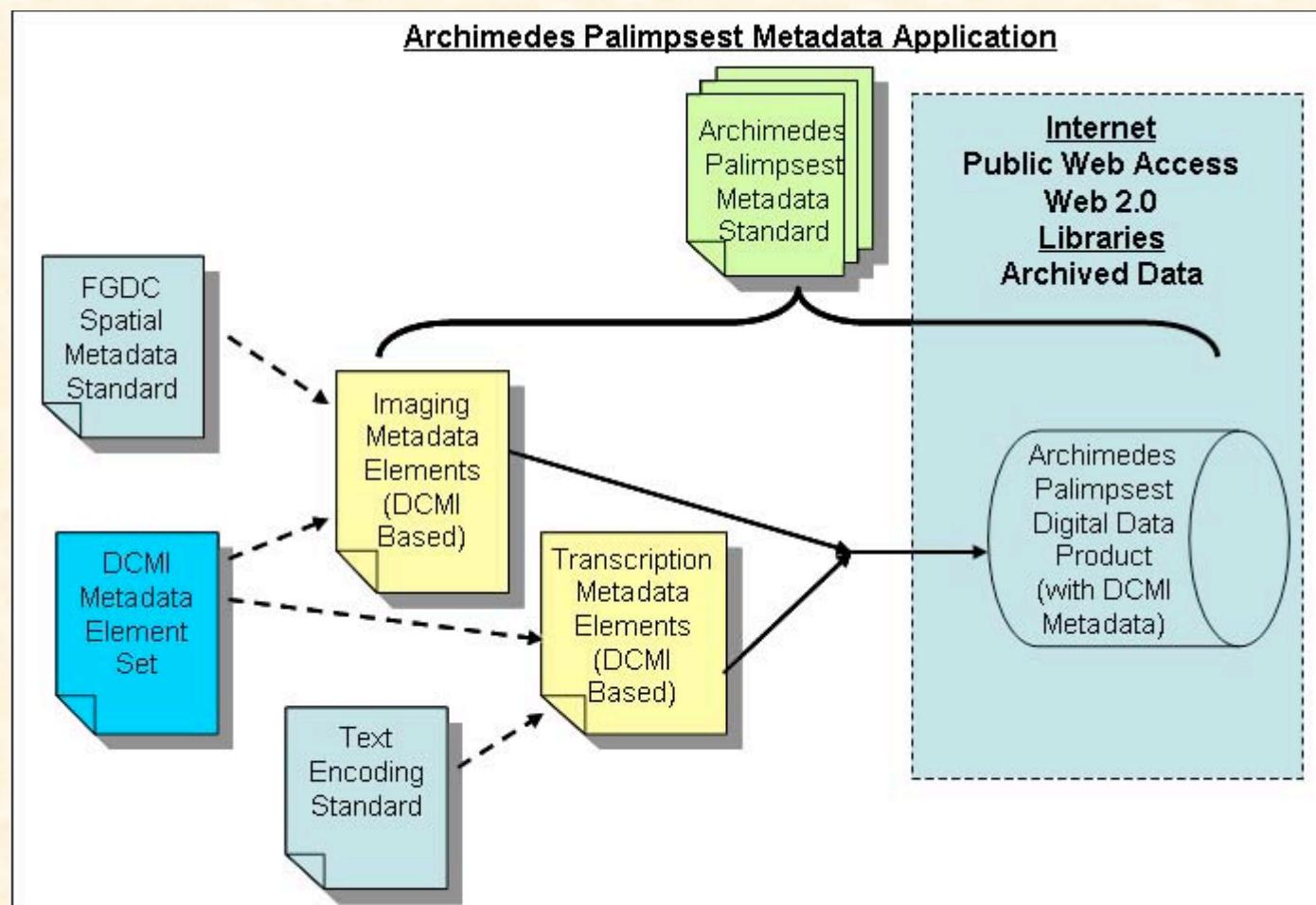
- maintain a standard for the research team's use of digital imagery or scanned data;
- provide information about an organization's data holdings to external data catalogs;
- provide information needed to process and interpret data to be transferred to an external source.

2. Scope. This standard is intended to support the collection and processing of multispectral imagery metadata. It is intended for use by the Archimedes Palimpsest imagery team and hosts of the archival imagery and scanned data. The standard is not intended to reflect an implementation

start

Inbox for mbt.r... Firefox Microsoft O... Microsoft O... Adobe Photoshop 97% 9:45 PM

Metadata Architecture



Archimedes & Dublin Core

Archimedes Palimpsest Metadata Standard

1.1. Resource Identifier:

Unique data identification number used to reference data set.
(Computer assigned ID Number)

1.2. Date:

Date of creation of resource.
(Date of imaging)

1.3. Author or Creator:

Individual(s) responsible for acquiring content for the data set.
(Names of Imagers or Imager Processors)

1.4 Subject and Keywords:

Description of object type.
("Archimedes Palimpsest")

1.5. Publisher:

Organization sponsoring the data set.
(Organization responsible for imaging)

1.6. Other Contributor(s):

Other contributors to the content of the resource or data study.
(Individuals contributing to the images)

1.7. Resource Type:

Type of data set based on the content of the data.
("Image" or "Annotation")

1.8 Source Lineage:

Information about events, parameters, and source data that constructed data set, and information about responsible parties.
(Images/Data that contributed to the image)

1.9. Rights Management:

Information about rights held in or over the resource.
("Copyright Owner of the Archimedes Palimpsest")

Dublin Core Metadata Elements

Element Name: Identifier

Label:Resource Identifier

An unambiguous reference to the resource within a given context.

Element Name: Date

Label:Date

A date of an event in the lifecycle of the resource.

Element Name: Creator

Label:Creator

An entity primarily responsible for making the content of the resource.

Element Name: Subject

Label:Subject and Keywords

A topic of the content of the resource.

Element Name: Publisher

Label:Publisher

An entity responsible for making the resource available

Element Name: Contributor

Label:Contributor

An entity responsible for making contributions to the content of the resource.

Element Name: Type

Label:Resource Type

The nature or genre of the content of the resource.

Element Name: Source

Label:Source

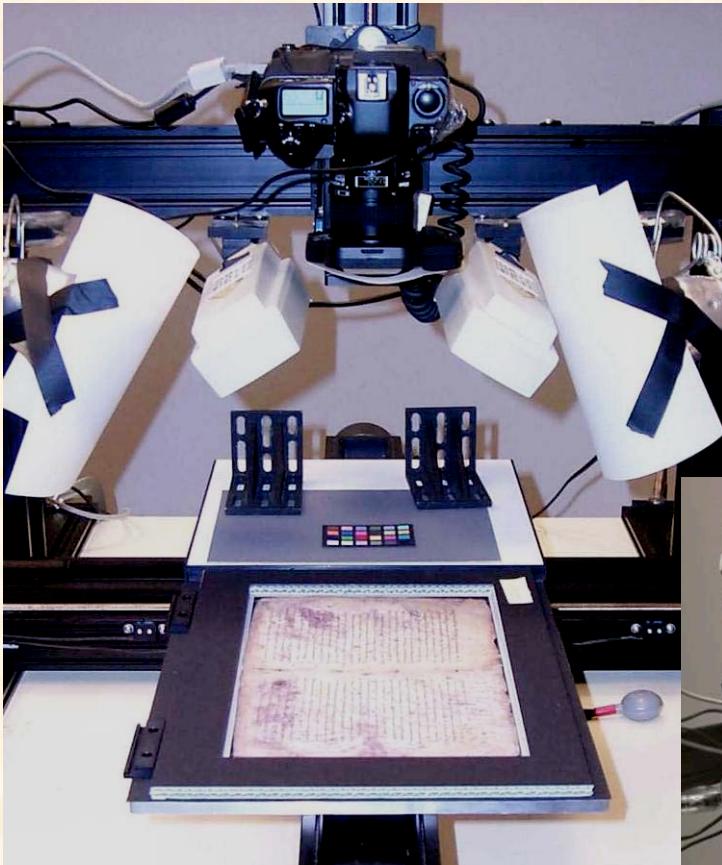
A reference to a resource from which the present resource is derived.

Element Name: Rights

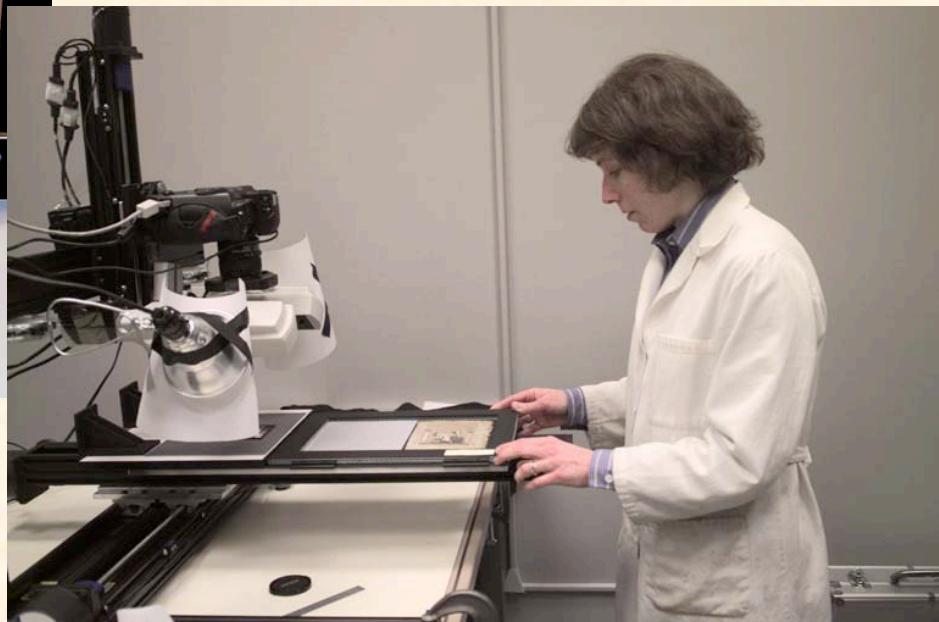
Label:Rights Management

Information about rights held in and over the resource.

"Production" Imaging

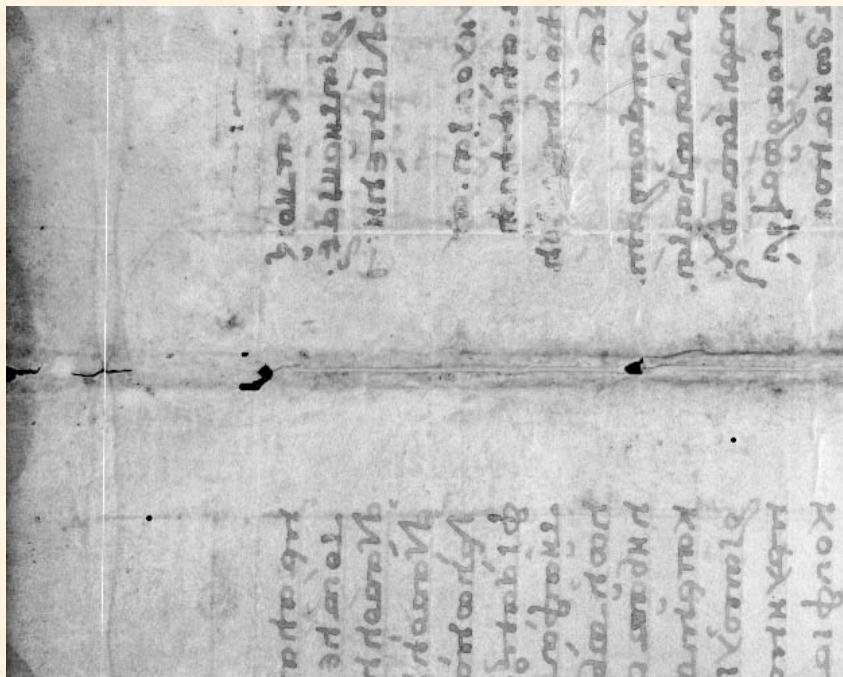


- Computer-controlled RGB digital camera and x-y-z translation table
- Two cameras
- Custom mattes for bifolia
 - Black backing to minimize reflection from opposite side

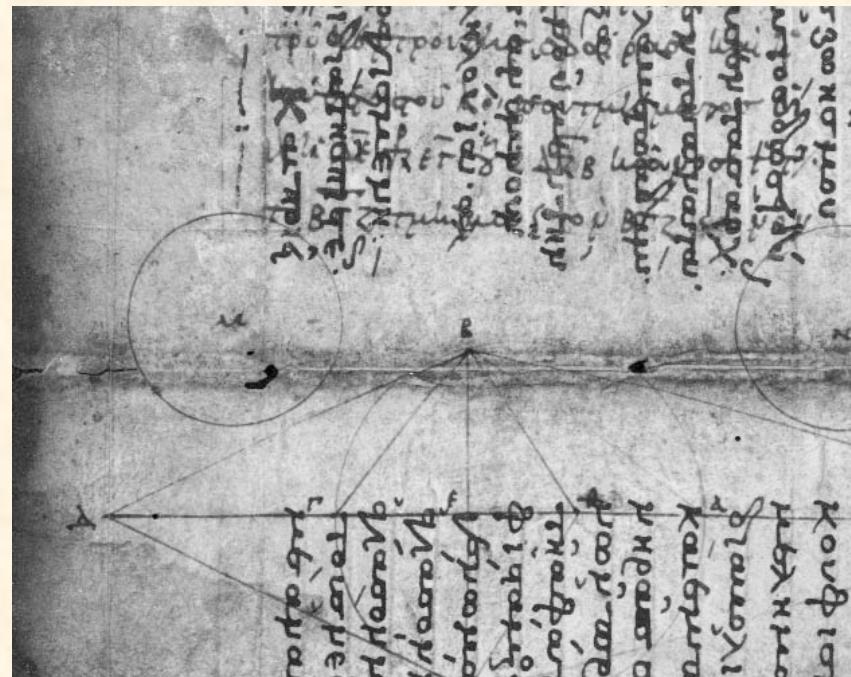


Archimedes Palimpsest Parchment Color Separations

f. 093v-092r



Tungsten **Red**



Ultraviolet **Blue**



Production of Pseudocolor Image

f. 093v-092r



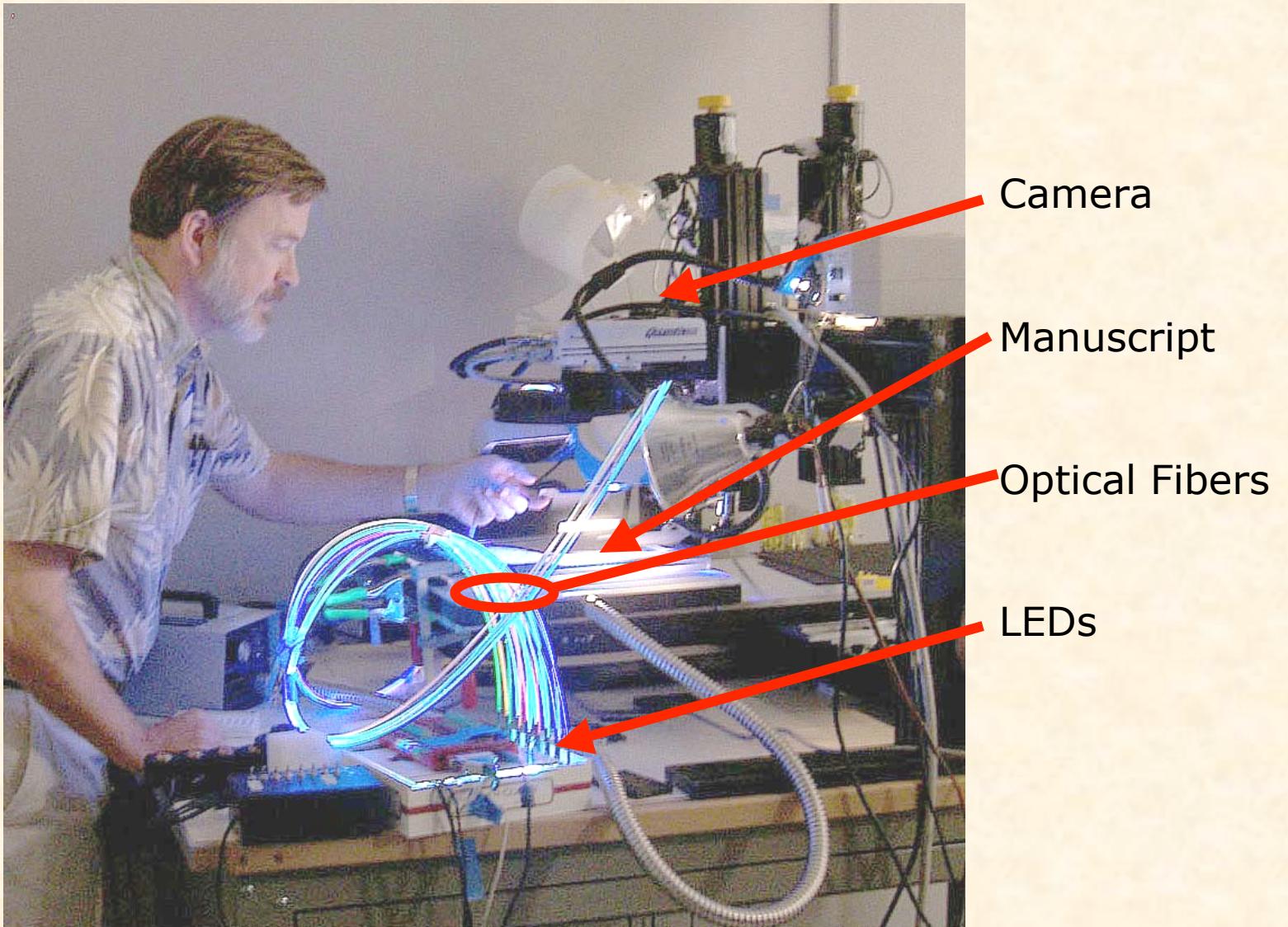
Visual Appearance



Pseudocolor

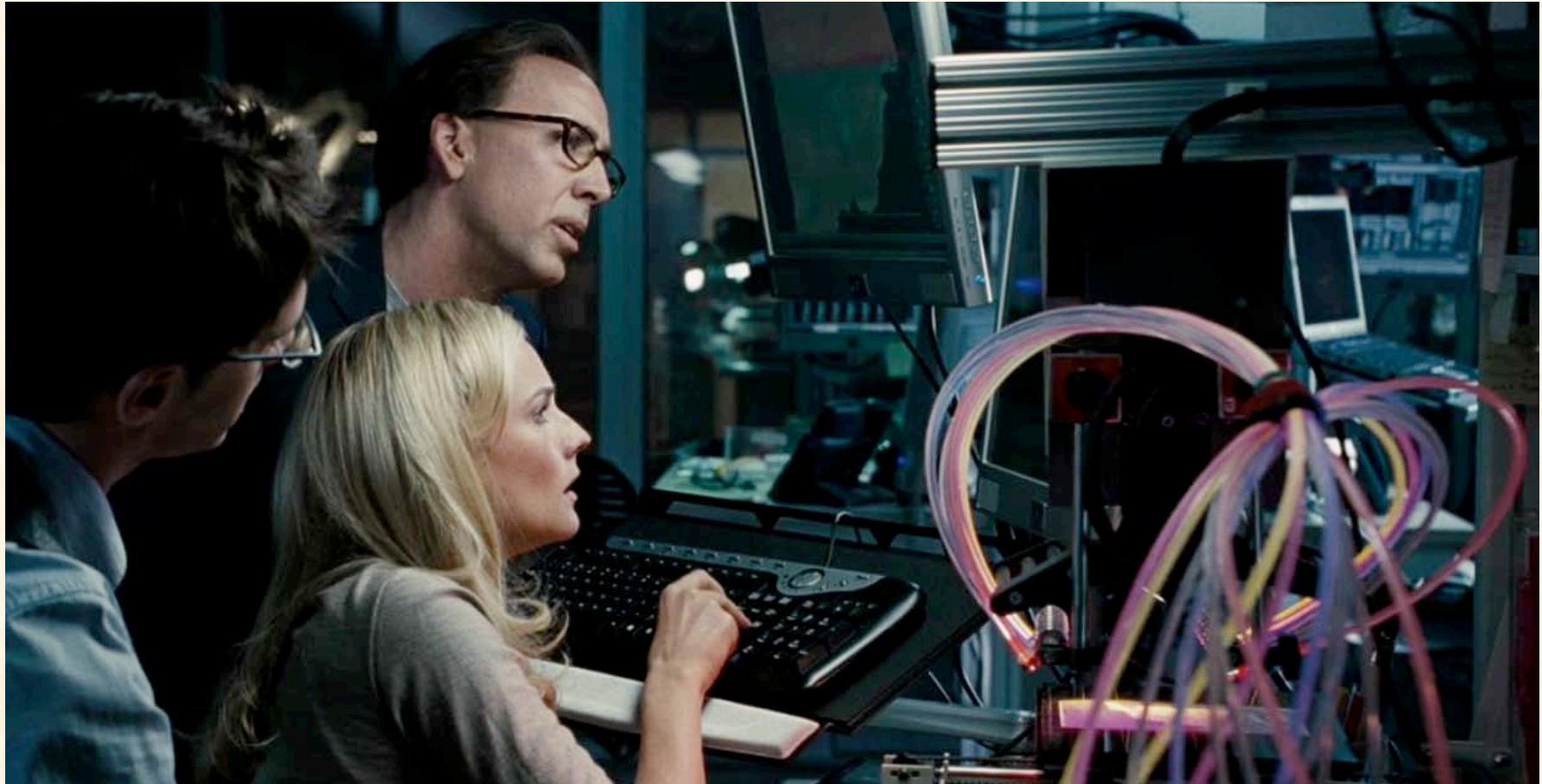


Prototype LED Illumination System, November 2006 at Walters Art Museum



"National Treasure: Book of Secrets"

December 2007



Justin Bartha

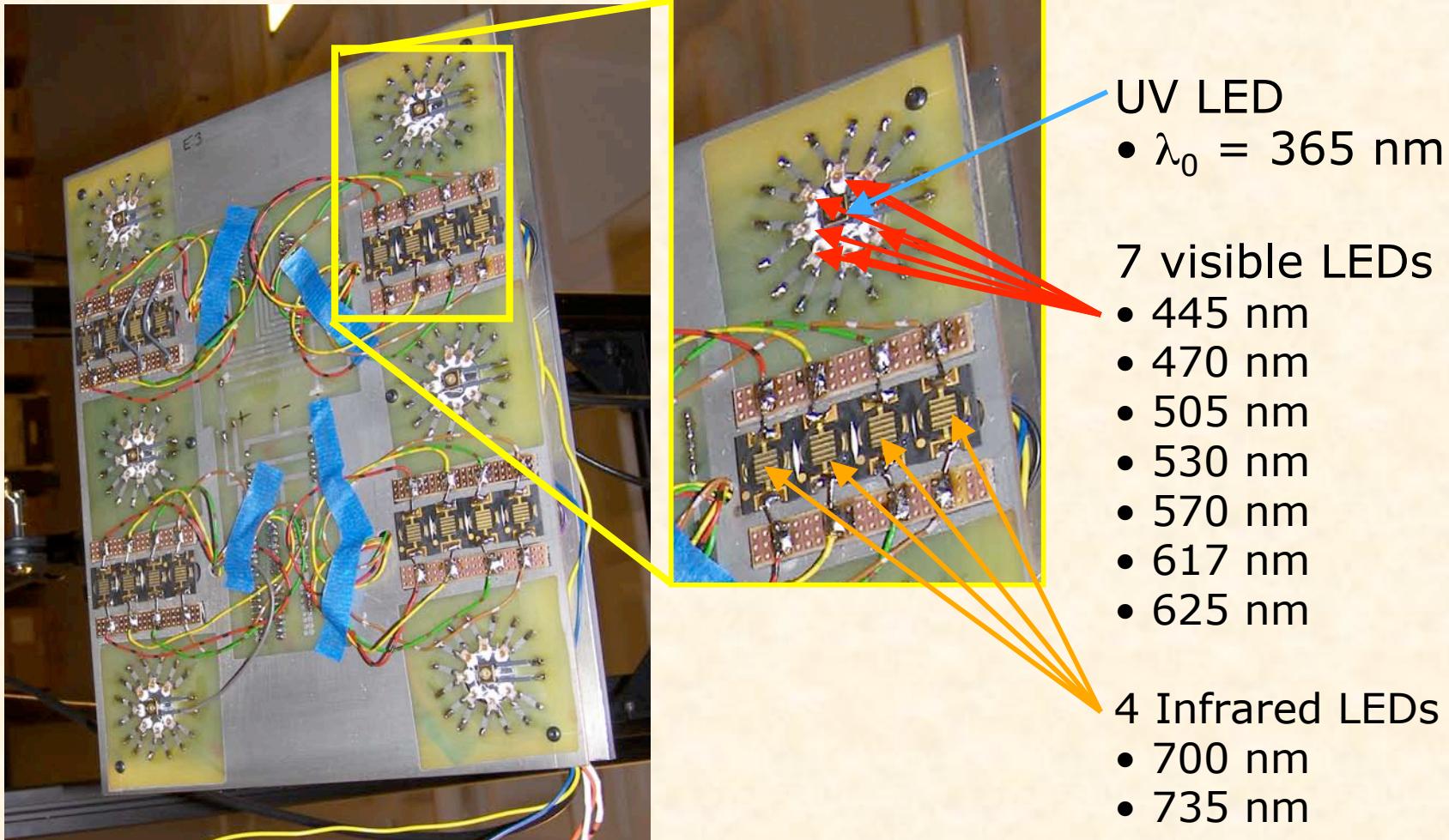
Nicolas Cage
Diane Kruger

"Imaging" of page fragment from "John Wilkes Booth's diary"
using prop system based on 2006 *LED* system

2007 LED Illumination Panel



LED Illumination Panel



UV LED
• $\lambda_0 = 365 \text{ nm}$

7 visible LEDs
• 445 nm
• 470 nm
• 505 nm
• 530 nm
• 570 nm
• 617 nm
• 625 nm

4 Infrared LEDs
• 700 nm
• 735 nm
• 780 nm
• 870 nm

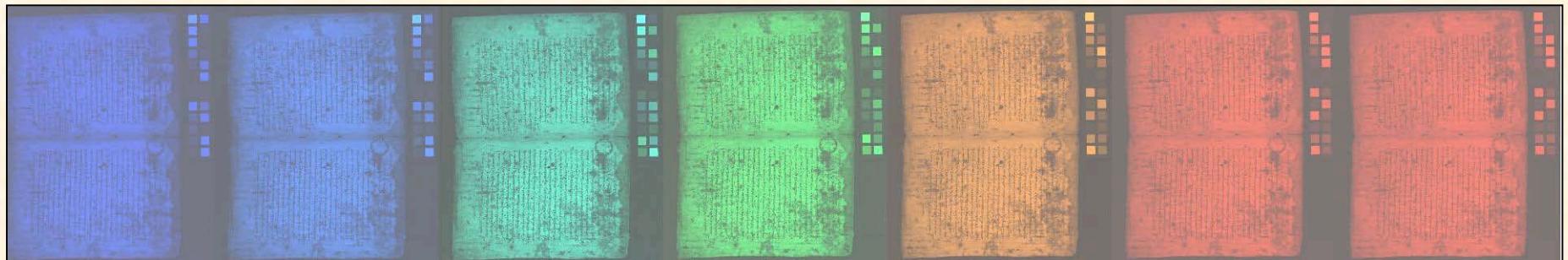
Two Panels, each w/ six banks of
12 visible and UV LEDs + two banks of 4 IR LEDs



Ultraviolet

365 nm

Visible Wavelengths



445 nm

470 nm

505 nm

530 nm

570 nm

617 nm

625 nm

Infrared Wavelengths



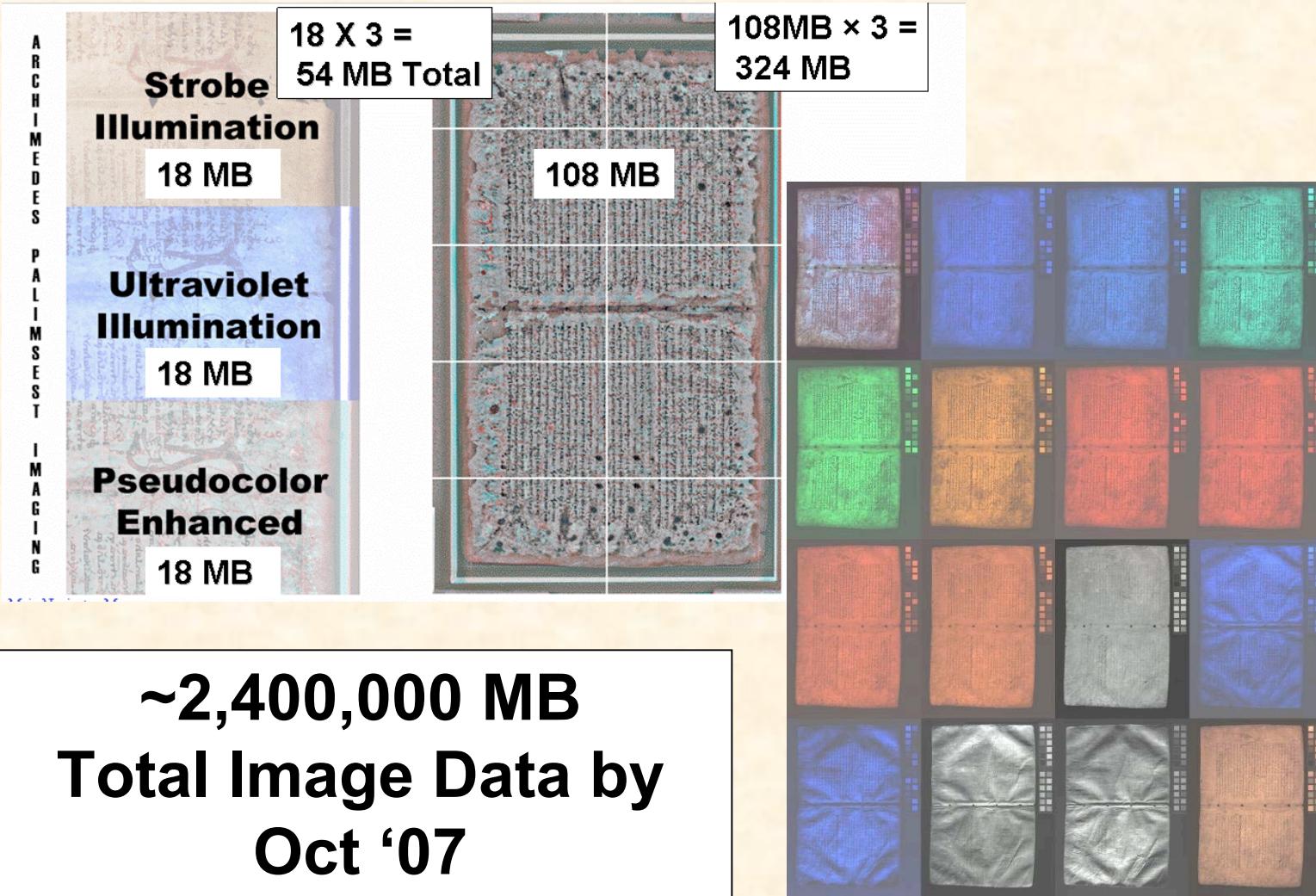
700 nm

730 nm

870 nm



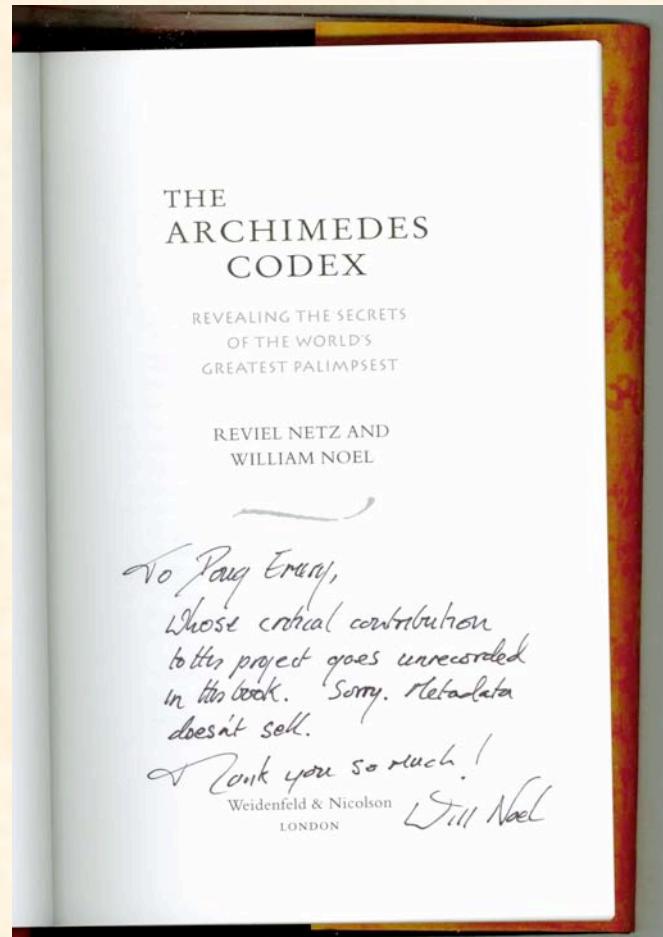
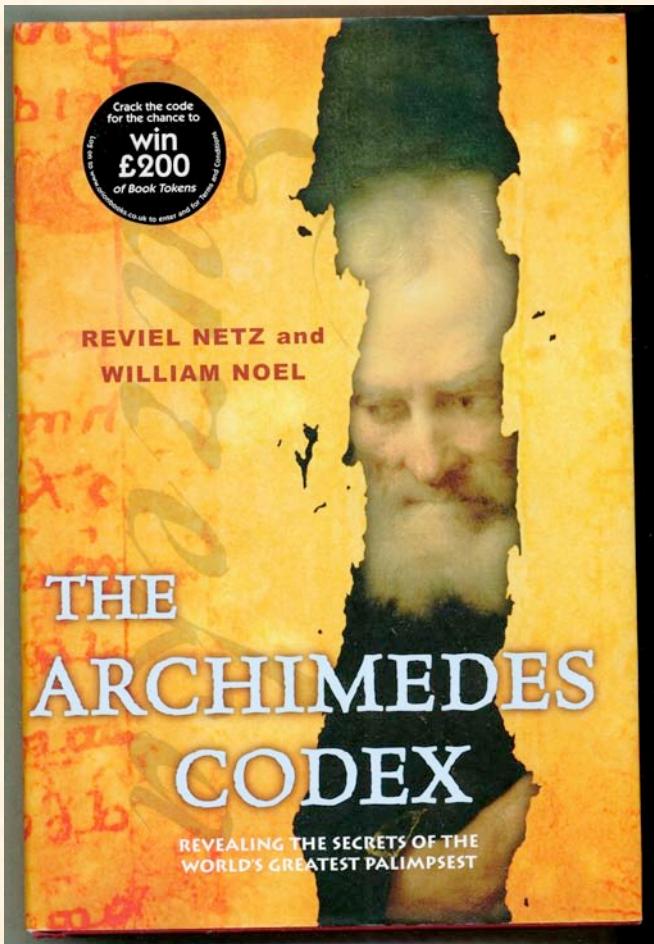
Data Integration



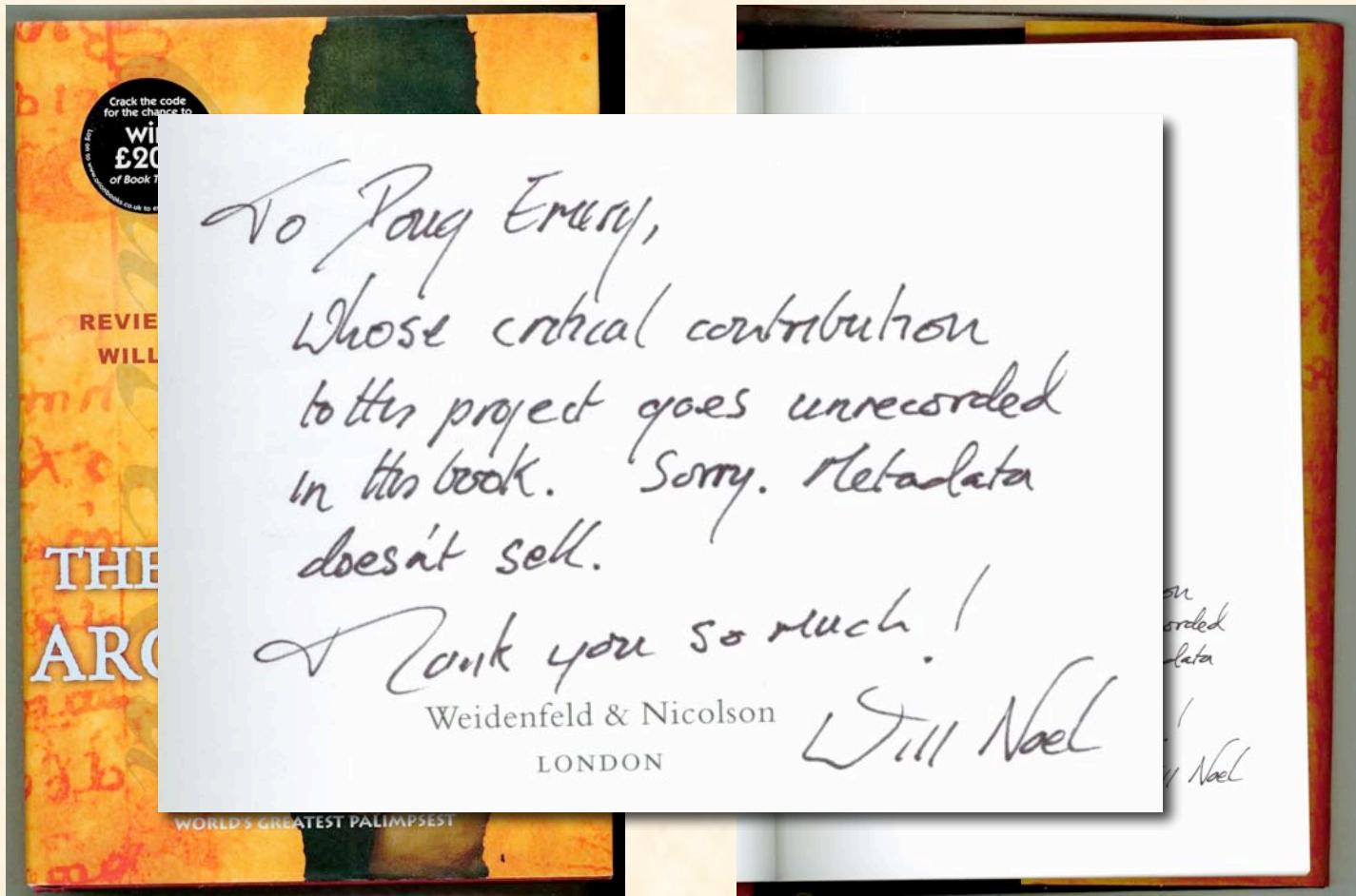
Data Set Size

- Data collected for eight years
- Over 10,000 images captured and processed over the course of the project
- Current data set size:
 - 6,700 raw and processed images (~ 2.2 TB)

The Popularity of Metadata



The Popularity of Metadata



Project Metadata Standards

Archimedes Palimpsest - Mozilla Firefox

File Edit View Go Bookmarks Tools Help

http://www.archimedespalimpsest.org/programmanage_documents.html

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archimedes_metadatastandard1-02.pdf (application/pdf Object) - Mozilla Firefox

File Edit View Go Bookmarks Tools Help

Pages Attachments

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start Inbox for mbt.r... Firefox Microsoft O... Microsoft O... Adobe Photoshop 97% 9:45 PM

Dublin Core Metadata Initiative Element Set

The screenshot shows a web browser window displaying the "Dublin Core Metadata Element Set, Version 1.1" page from <http://dublincore.org/documents/dces/>. The page has a light beige background with an orange header bar. The header includes the DCMI logo (a sunburst icon), the text "Dublin Core® Metadata Initiative", and navigation links for "ABOUT THE INITIATIVE", "DOCUMENTS", "GROUPS", "DCMI NEWS", "TOOLS AND SOFTWARE", and "PROJECTS". Below the header, there's a breadcrumb trail "Home > Documents > Dces >" and a search bar with "Enter keyword" and "Search" buttons. The main content area features a yellow background box containing metadata details: Identifier (<http://dublincore.org/documents/2008/01/14/dces/>), Supersedes (<http://dublincore.org/documents/2006/12/18/dces/>), Latest version (<http://dublincore.org/documents/dces/>), Date Issued (2008-01-14), Status of This is a DCMI Recommendation document, and Description of This document provides ready reference for the Dublin Core Metadata Element Set, Version 1.1. For more detailed document: documentation and links to historical versioning information, see the document ["DCMI Metadata Terms"](#). Below this is a section titled "Introduction" with text about the origin and purpose of the standard.

Dublin Core Metadata Element Set, Version 1.1

Identifier: <http://dublincore.org/documents/2008/01/14/dces/>

Supersedes: <http://dublincore.org/documents/2006/12/18/dces/>

Latest version: <http://dublincore.org/documents/dces/>

Date Issued: 2008-01-14

Status of This is a DCMI Recommendation document.

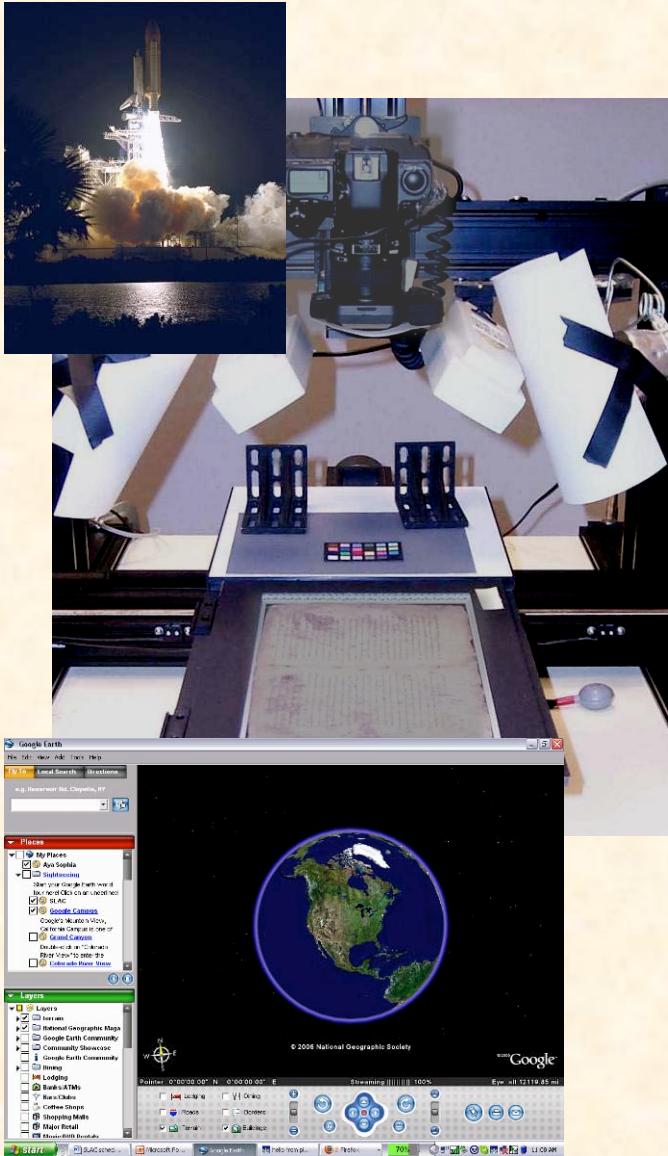
Description of This document provides ready reference for the Dublin Core Metadata Element Set, Version 1.1. For more detailed document: documentation and links to historical versioning information, see the document ["DCMI Metadata Terms"](#).

Introduction

The Dublin Core Metadata Element Set is a vocabulary of fifteen properties for use in resource description. The name "Dublin" is due to its origin at a 1995 invitational workshop in Dublin, Ohio; "core" because its elements are broad and generic, usable for describing a wide range of resources.

The fifteen element "Dublin Core" described in this standard is part of a larger set of metadata vocabularies and technical specifications maintained by the Dublin Core Metadata Initiative (DCMI). The full set of vocabularies, DCMI Metadata Terms [DCMI-TERMS], also includes sets of resource classes (including the DCMI Type Vocabulary [DCMI-TYPE]), vocabulary encoding schemes, and syntax encoding schemes. The terms in DCMI vocabularies are intended to be used in combination with terms from other, compatible vocabularies in the context of application profiles and on the basis of the DCMI Abstract Model [DCAM].

Content Standard for Digital Geospatial Data



2. Spatial Data Reference Information: the spatial location of the data set

2.1 Coordinate Units

DOMAIN: "pixel"

2.2 X Resolution: # of

DOMAIN: REAL

2.3 Y Resolution: # of

DOMAIN: REAL

2.4 Upper Left XY Coordinates

expressed in resolution

DOMAIN: $x = n \text{ a}$

2.5 Lower Right XY Coordinates

imaging expressed

DOMAIN: REAL

2.6 Bounding Coordinates

Cartesian coordinates
upper left, lower right

DOMAIN: REAL

2.7 Grid Coordinate System

mathematically defined
can be readily transferred

DOMAIN: TEXT

2.8 Vertical Coordinate System

from which vertical

DOMAIN: TEXT

2.9 X-Positional Accuracy

of the spatial objects

DOMAIN: REAL

2.10 Y-Positional Accuracy

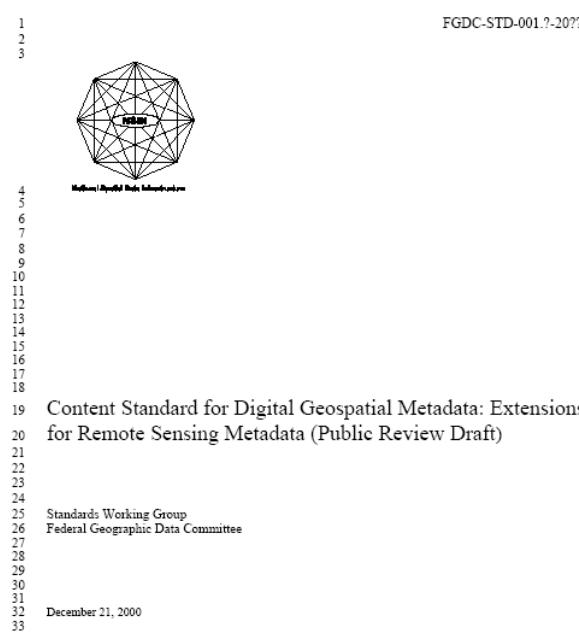
. an estimate of accuracy of the horizontal positions of the spatial objects.

DOMAIN: REAL NUMBER

2.11 Vertical Positional Accuracy

: an estimate of accuracy of the vertical positions in the data set.

DOMAIN: REAL NUMBER



Federal Geographic Data Committee
Department of Agriculture • Department of Commerce • Department of Defense • Department of Energy
Department of Housing and Urban Development • Department of the Interior • Department of State
Department of Transportation • Environmental Protection Agency
Federal Emergency Management Agency • Library of Congress
National Aeronautics and Space Administration • National Archives and Records Administration
Tennessee Valley Authority

Digital Archimedes Project Goals

1. Serve as the **authoritative digital data set** of images in a standardized format that meets the needs of users, information providers, archives and libraries.
2. Provide **derived information in the context of digital images** of the original manuscript in a single integrated package.
3. Offer a **standard product sustainable by users** to which current or future contributors can add additional standardized information.

In other words...

- Registered images
- Spatially mapped transcriptions
- Documented archival structure

An integrated archive of images, mapped transcriptions, metadata and documentation for present and future use

Image Types

- August 2007 (all folios):
 - Ultraviolet: 365nm
 - Visible: 445, 470, 505, 530, 570, 617, 625nm, and tungsten
 - Infrared: 700, 735, 870nm
 - Raking, left and right: 445, 910nm
 - Processed: pseudo (no-veil, “sharpie”), true color, normalized UV
- XRF of selected folios and selected elements including:
 - Ba, Ca, Cl, Cu, Fe, Ge, K, Mn, Ph, S, Si, and Zn

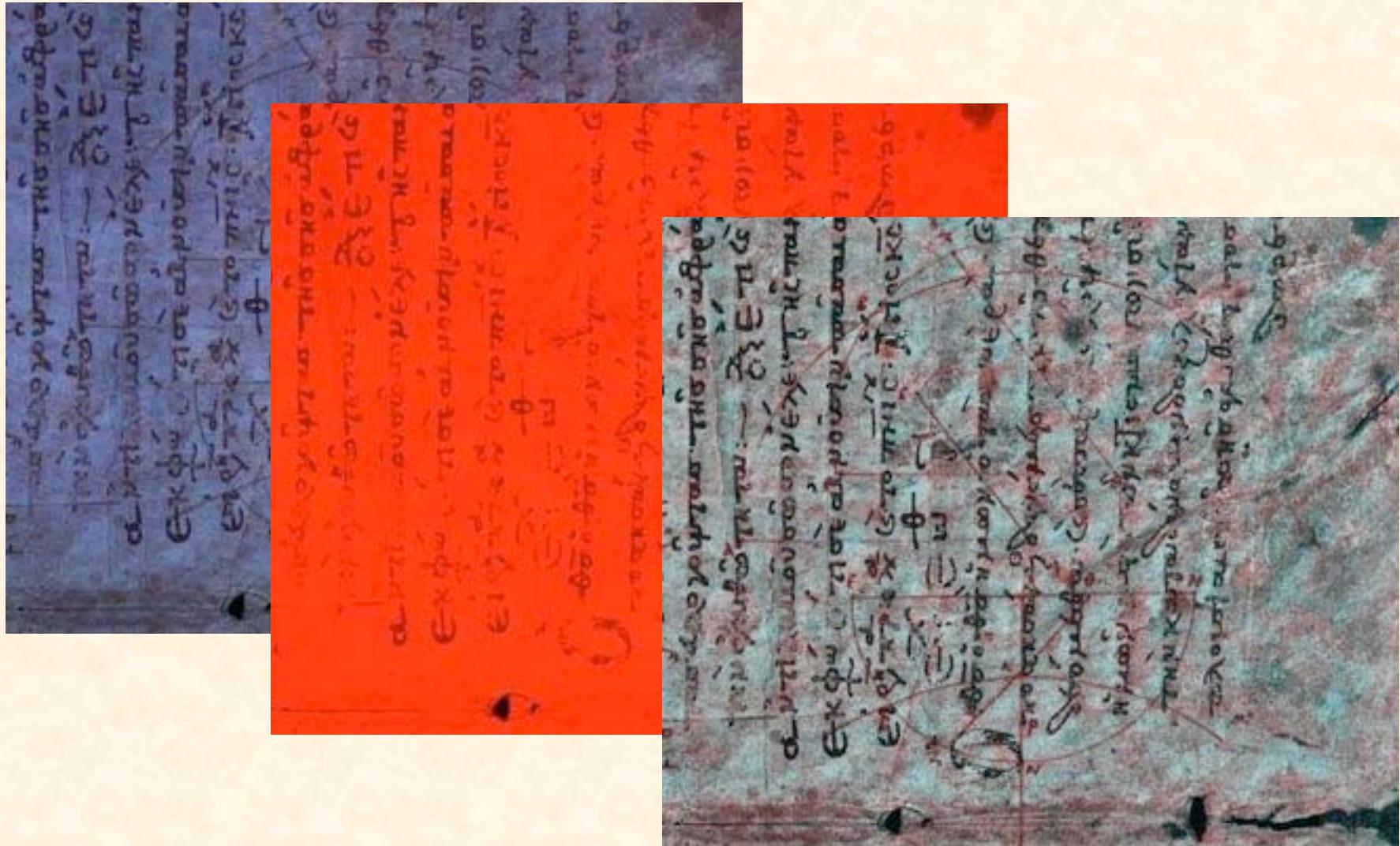
Image Types (contd.)

- Heiberg photographs
 - Digital images of J.L. Heiberg's 1906 photographs in UV and visible light
- Cambridge leaf
 - Images of an unfoliated leaf from Cambridge University in UV and visible light
- Chicago negative
 - One image of negative of folio 57 verso from the University of Chicago in visible light

Image Details

- All images:
 - TIFF 6.0
 - Eight bits per sample (either monochrome or 24-bit color)
 - Resolution is approximately 33 pixels per millimeter
- All images are registered to 8160x10880 pixels
- Registration based on images done in August 2007
- Other images (XRF, Heiberg photographs, etc.) manually registered (scaled and warped to August 2007 images)

Registered Images



Project Data/Metadata Goals

- Long-term data set viability beyond the lifetime of current technologies
 - Adherence to existing broadly accepted standards
 - Simple, flat metadata records
- Integration of metadata with images and transcriptions

Imaging Metadata

Six Types of Metadata Elements:

1. Identification Information
2. Spatial Data Reference Information
3. Imaging & Spectral Data Reference Information
4. Data Type Information
5. Data Content Information
6. Metadata Reference Information
(including XRF Extensions)

Early Metadata Collection

	AD	AE	AF	AG	AH	AI	AJ	AK
1	Resolution units	X-resolution	Y-resolution	Pixel X-pitch (µm)	Pixel Y-pitch (µm)	Pixel X-count	Pixel Y-count	Wh
2								
3								
4	1/mm	25.4	25.4	9	9	1536	1024	
5	1/mm	25.4	25.4	9	9	1536	1024	
6	1/mm	25.4	25.4	9	9	1536	1024	
7	1/mm	25.4	25.4	9	9	1536	1024	
8	1/mm	25.4	25.4	9	9	1536	1024	
9	1/mm	25.4	25.4	9	9	1536	1024	
10	1/mm	25.4	25.4	9	9	1536	1024	
11	1/mm	25.4	25.4	9	9	1536	1024	
12	1/mm	25.4	25.4	9	9	1536	1024	
13	1/mm	25.4	25.4	9	9	1536	1024	
14	1/mm	25.4	25.4	9	9	1536	1024	
15	1/mm	25.4	25.4	9	9	1536	1024	
16	1/mm	25.4	25.4	9	9	1536	1024	
17	1/mm	25.4	25.4	9	9	1536	1024	
18	1/mm	25.4	25.4	9	9	1536	1024	
19	1/mm	25.4	25.4	9	9	1536	1024	
20	1/mm	25.4	25.4	9	9	1536	1024	
21	1/mm	25.4	25.4	9	9	1536	1024	
22	1/mm	25.4	25.4	9	9	1536	1024	
23	1/mm	25.4	25.4	9	9	1536	1024	
24	1/mm	25.4	25.4	9	9	1536	1024	
25	1/mm	25.4	25.4	9	9	1536	1024	

Logged Imaging Data Fields

Image Subject	Type Image	Pixel X-pitch (μm)
Leaf	Camera Imaging Mode	Pixel Y-pitch (μm)
Image Ref. No.	Folio #?	Pixel X-count
Folio state	Proj Phase	Pixel Y-count
Folio 1 #	Phase Part	White Bal
R V	Camera Type	Camera incidence angle (deg)
Folio 1 Part	Camera Serial	Illum Desc Char
Folio 2 #	Film Speed	Camera Imaging Depth (bits)
R V	Film Brand	Collection Desc Chars
Folio 2 Part	Film Color	Color Temp (C)
File Name	Lens Brand	Illum Source Brand
Position	Lens Serial Number	Illum Source Model
Aper. (f#)	Lens size (mm)	Illum Desc General
Shutter (sec)	Resolution units	Illum Source Wattage
Illum Type	X-resolution	Illum Source No
Creation Date	Y-resolution	Wavelength Unit

Logged Imaging Data Fields (ctd.)

Illum Wavelength	Acquisition Polarization
Illum incidence angle (deg)	Filter Angle (degrees)
Illum Filter	Coordinate Units
Illum Filter Center Wavelength	Delta X (mm)
Illum Filt FWHM	Delta Y (mm)
Illum Polarization Filter	No. of Horiz. Regions
Illumination Polarization Filter Angle (degrees)	No. of Vert. Regions
Spectral Range	No. of Regions of Folio
Acquisition Filter	ULX
Acquisition Filter Center Wavelength	ULY
Acq Filt FWHM	LRX
Acquisition Polarization Filter	LRY
	Image Set Layout (H x V)
	Image Creation Text

Mapping Data to the Standard

	A	B	C	D
1	Field ID	Name	Table	Definition
2	60017	Type	Constant	1.7 Resource Type: Type of data set based on the content of the data: "Image" "Annotation" "Stitched Image"
9	60018	Source	Image	1.8 Source Lineage: information about the events, parameters, and source data that constructed the data set, and information about the responsible parties.
10	60019	Coverage	Constant	1.8 Source Lineage Location: Location of the imaging
11	60022	Rights	Constant	1.9 Rights Management: Information about rights held in or over the resource
12	60060	ID_File_Name	Image	1.1.1 File Name: Unique identifier for the data file or files assigned to the original image or scanned data
15	60023	SPTL_Coordinate_Units	Constant	2.1 Coordinate Units: unit type used in quantitative spatial metadata: "pixel" "centimeters" "millimeters" "micrometer"
16	60024	SPTL_X_Resolution	Constant	2.2 X Resolution: number of resolution elements per coordinate unit in the x-direction
17	60025	SPTL_Y_Resolution	Constant	2.3 Y Resolution: number of resolution elements per coordinate unit in the y-direction
18	70003	SPTL_X_Resolution_Unit_of_Measure	Constant	2.3 X Resolution Unit of Measure

Mapping Metadata Fields

- All log fields are mapped to the appropriate section of the standard (Identification, Imaging data, Spatial information, etc.), and given a standard name:
 - X-resolution > SPTL_X_Resolution
 - Acquisition Filter > IMG_Acquisition_Filter
- All standard-defined fields not present in the logs are added:
 - Type, Source, Rights, Format, Creator, Contributor, and metadata standard identification

Sample metadata fields:

- Identifier -- a unique ID number
- Creator -- one of the imaging scientists
- Date -- the date and time the image was created
- IMG_Lens_Brand-- who made the camera lens
- IMG_Aperture_f -- the camera f stop
- IMG_Illumination_Wavelength -- the wavelength of the illumination source in nanometers
- CONT_Foliation_Scheme -- either over-text (prayer book) or under text

Metadata Elements

103 core and spectral image metadata elements

53 XRF metadata elements

A	B	C	E	F	G
Field ID	Name	Proc?	Definition	Values	Comments
60001	Identifier	X	1.1 Resource Identifier: A unique data identification number used to reference the data set.	[?]	Needs review
60003	Date	X	1.2 Date: The date the resource was created or last modified.	9/10/2013	Date printed
60005	Creator	X	1.3 Creator: The individual or organization that produced the data set.	[now]	Creator of Ap
60010	Subject	X	1.4 Subject and Key words: Description of object type	"Euchologion Image Archimedes Palimpsest Image Palimpsest Image Multispectral Image Digital Image Greek Manuscript Byzantine Manuscript Manuscript 3rd Century AD 3rd Century BC Archimedes Palimpsest Metochion of the Holy Sepulchre Palimpsest MS 355/Christie's MS 355 MS 355 Christie's Metochion Art USA 2007-09-10 2017-09-10 26 Baltimore, MD USA"	Content (Archimedes Palimpsest)
60012	Contributor	X	1.6 Other Contributor(s): Other contributors to the content of the resource, data set or study	"Will Noel Michael Toth Kevin Auer Doug Emery Kate Gerry Daniel Potter Abigail Quandt Anel Tabritina Ben Tilghman John R. Stokes John T. Stokes" plus BCB, Roger Easton	
60017	Type	X	1.7 Resource Type: Type of data set based on the content of the data: "Image" "Annotation" "Stitched Image"	"Image/tiff"	
60018	Source	X	1.8 Source Lineage: Information about the events, parameters, and source data that constructed the data set, and information about responsible parties.	Folio:"Image processed from images <#,FileName, #,Filename, etc.> of folio <value> of the Archimedes Palimpsest/Metochion of the Holy Sepulchre Palimpsest (MS 355/Christie's MS 355) Christie's Metochion Art USA 2007-09-10 2017-09-10 26 Baltimore, MD USA"	
60019	Coverage	X	1.9 Source Coverage: Location of the imaging	[Update to CC License]	
60022	Rights	X	1.9 Rights Management: Information about rights held in or over the resource		
60060	ID_File_Name	X	1.1 File Name: Unique identifier for the data file	DB	Needs to be confirmed
60023	SPTL_Coordinate_Unit_of_Measure	X	2.1 Coordinate Unit of Measure: The unit of quantitative spatial metadata, "pixel" "centimeters" "millimeters" "micrometer"		Confirm change
60024	SPTL_X_Resolution	X	2.2 X Resolution: number of resolution elements per coordinate unit in the x-direction	"32.8"	
60025	SPTL_Y_Resolution	X	2.3 Y Resolution: number of resolution elements per coordinate unit in the y-direction	"32.8"	

Metadata Format

- Simple Name/Value pair data structure:

```
Identifier 20000
Date 2007-12-21T13:12:55-04:00
Creator Christens-Barry, Bill
Creator Easton, Roger
Creator Knox, Keith
Subject Euchologion Image
Subject Archimedes Palimpsest Image
Subject Palimpsest Image
Subject Multispectral Image
Subject Digital Image
Subject Greek Manuscript Image
Subject Byzantine Manuscript Image
Subject Parchment Manuscript Image
Subject 13th Century Manuscript Image
Subject 10th Century Manuscript Image
Subject Private Collection
Publisher Owner of the Archimedes Palimpsest
Contributor Noel, Will
...
```

Metadata for Multiple Sources

Contributor Derek Walvoord

Contributor Matt Heimbueger

Format image/tiff

Source Processed from XRF data file with Identifier
X000000234, A001R_MAR06_014.RAS_A

Source Processed from XRF data file with Identifier
X000000235, A001R_MAR06_015.RAS_A

Source Processed from XRF data file with Identifier
X000000232, A001R_MAR06_012.RAS_A

Source Processed from XRF data file with Identifier
X000000233, A001R_MAR06_013.RAS_A

...

Source Processed from XRF data file with Identifier
X000000223, A001R_MAR06_003.RAS_A

Source Processed from XRF data file with Identifier
X000000221, A001R_MAR06_001.RAS_A

Metadata for Multiple Sources (ctd.)

XRF_DAT_Compression_Technique N/A
XRF_DAT_File_Size X000000223/A001R_MAR06_003.RAS_A: 15259
XRF_DAT_File_Size X000000225/A001R_MAR06_005.RAS_A: 39701
XRF_DAT_File_Size X000000235/A001R_MAR06_015.RAS_A: 40432
XRF_DAT_File_Size X000000234/A001R_MAR06_014.RAS_A: 54699
XRF_DAT_File_Size X000000232/A001R_MAR06_012.RAS_A: 7479
XRF_DAT_File_Size X000000222/A001R_MAR06_002.RAS_A: 45989
XRF_DAT_File_Size X000000227/A001R_MAR06_007.RAS_A: 50134
XRF_DAT_File_Size X000000226/A001R_MAR06_006.RAS_A: 53406
XRF_DAT_File_Size X000000221/A001R_MAR06_001.RAS_A: 52494
XRF_DAT_File_Size X000000233/A001R_MAR06_013.RAS_A: 39994
XRF_DAT_File_Size X000000224/A001R_MAR06_004.RAS_A: 53970
XRF_DAT_File_Size X000000229/A001R_MAR06_009.RAS_A: 39424
XRF_DAT_File_Size X000000228/A001R_MAR06_008.RAS_A: 14436
XRF_DAT_File_Size X000000231/A001R_MAR06_011.RAS_A: 54344
XRF_DAT_File_Size X000000230/A001R_MAR06_010.RAS_A: 53113
XRF_DAT_File_Processing SLAC RAS to ASCII transfer
XRF_Pixels_per_Line 1125

Metadata-Image Integration

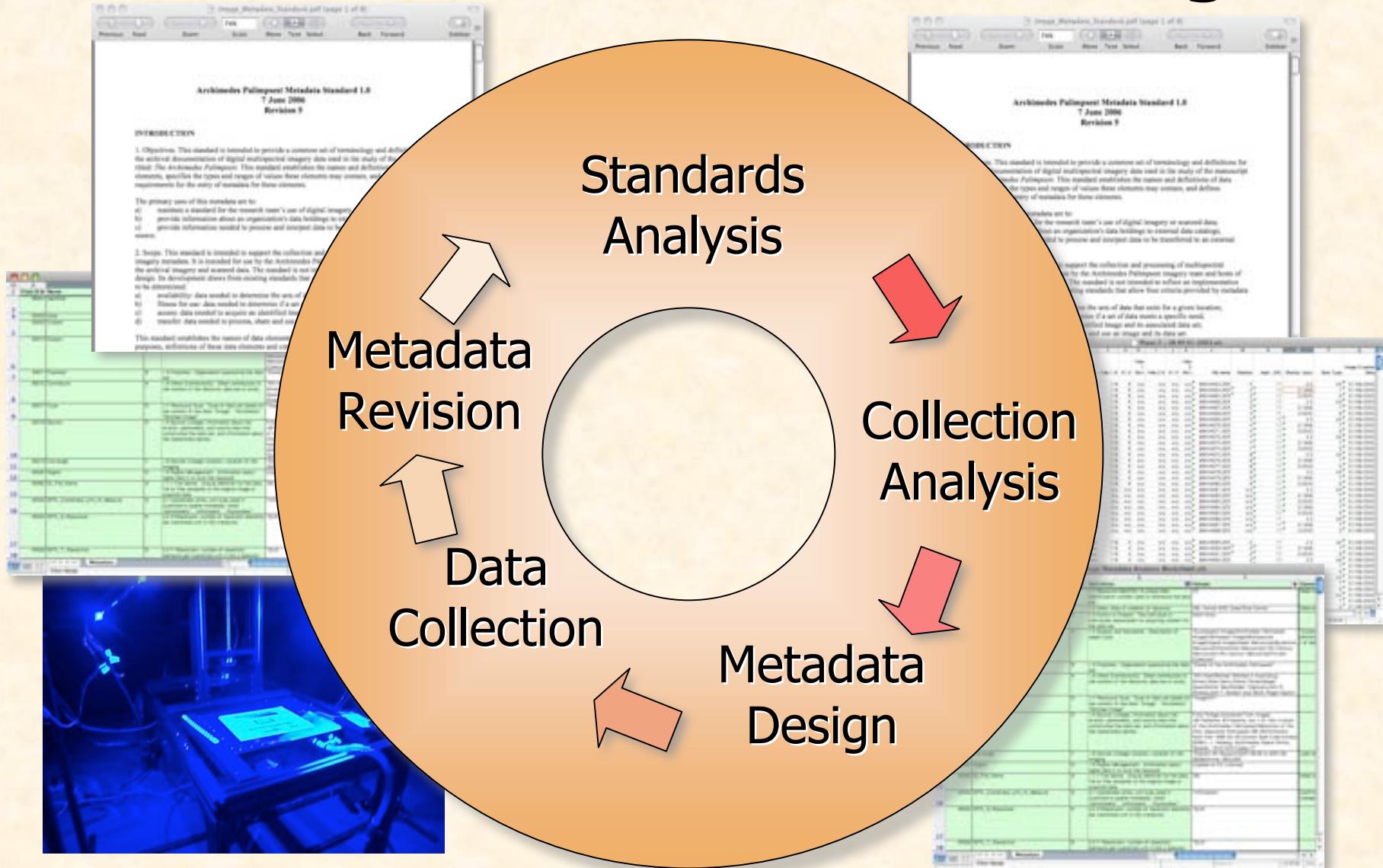
- Metadata stored in TIFF ImageDescription tag
 - Common tag, accessible to all TIFF tag-aware tools
 - Integration of metadata and image
 - Adherence to an existing standard, TIFF 6.0

XMP Sidecar Files

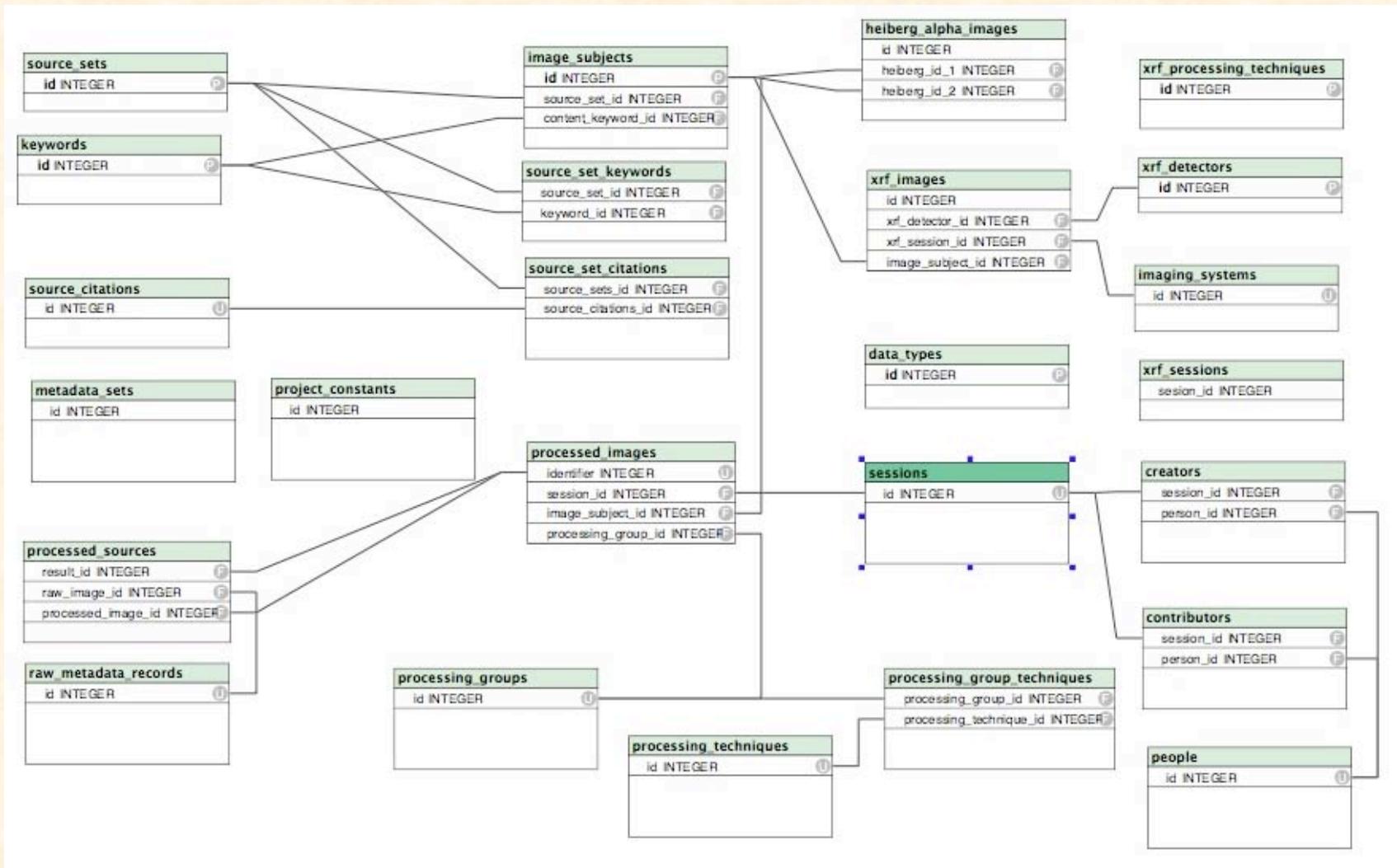
```
<?xml version="1.0" encoding="UTF-8" ?>
<x:xmpmeta xmlns:x="adobe:ns:meta/"
    x:xmptk="Adobe XMP Core 4.1.1">
<rdf:RDF
    xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#">
    <!-- ... -->
    <rdf:Description rdf:about=""
        xmlns:dc="http://purl.org/dc/elements/1.1/">
        <dc:identifier>22780</dc:identifier>
        <dc:date>2007-12-30T23:56:23-05:00</dc:date>
        <dc:creator>
            <rdf:Seq>
                <rdf:li>Bill Christens-Barry</rdf:li>
                <rdf:li>Roger Easton</rdf:li>
                <rdf:li>Keith Knox</rdf:li>
            </rdf:Seq>
        </dc:creator>
        <dc:subject>
            <rdf:Bag>
                <!-- ... -->
```

```
<?xml version="1.0" encoding="UTF-8"?>
<x:xmpmeta xmlns:x="adobe:ns:meta/" x:xmptk="Adobe XMP Core 4.1.1">
  <rdf:RDF xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#">
    <!-- ... -->
    <ap:XRF_SPTL_UpLeft_X_Coordinate>
      <rdf:Bag>
        <rdf:li>X000000234/A001R_MAR06_014.RAS_A: 10</rdf:li>
        <rdf:li>X000000235/A001R_MAR06_015.RAS_A: 10</rdf:li>
        <rdf:li>X000000232/A001R_MAR06_012.RAS_A: 53</rdf:li>
        <rdf:li>X000000233/A001R_MAR06_013.RAS_A: 53</rdf:li>
        <rdf:li>X000000230/A001R_MAR06_010.RAS_A: 53</rdf:li>
        <rdf:li>X000000231/A001R_MAR06_011.RAS_A: 53</rdf:li>
        <rdf:li>X000000228/A001R_MAR06_008.RAS_A: 96</rdf:li>
        <rdf:li>X000000229/A001R_MAR06_009.RAS_A: 96</rdf:li>
        <rdf:li>X000000226/A001R_MAR06_006.RAS_A: 96</rdf:li>
        <rdf:li>X000000227/A001R_MAR06_007.RAS_A: 96</rdf:li>
        <rdf:li>X000000224/A001R_MAR06_004.RAS_A: 139</rdf:li>
        <rdf:li>X000000225/A001R_MAR06_005.RAS_A: 139</rdf:li>
        <rdf:li>X000000222/A001R_MAR06_002.RAS_A: 139</rdf:li>
        <rdf:li>X000000223/A001R_MAR06_003.RAS_A: 139</rdf:li>
        <rdf:li>X000000221/A001R_MAR06_001.RAS_A: 10</rdf:li>
      </rdf:Bag>
    </ap:XRF_SPTL_UpLeft_X_Coordinate>
```

Metadata Collection Planning



Metadata Complexity



Transcription Purpose & Goals

- Transcription as guide for images:
 - Line-by-line mapping from text to image
- Achieving acceptance and longevity through:
 - Adherence to transcription standards in the field of classics
 - Adherence to international text encoding standards

Where We Began

f 137v - 13Gr

- 1 σια τῶν ὑμετέρων κινδύνων ὥσπερ] καὶ πρότερον
- 2 τοὺς ελαγνάς ἐλευθερώσαι δεῖ δὲ τῶν κινδύνων
- 3 πάντων τὰς μὲν ἡράκλεις καὶ τὰς ὑποθέσεις εἰς τοὺς
- 4 πρὸ τοῦ οὐτας λαρυγέρειν τ. ^{ad*} ἐκ τουτῶν αποβαί
- 5 νον(το)ν >(s) εἰ την τύχην διωνδας δεινον αν τι ἀσιστοι γε
- 6 νεστοι, μ. δημοστένην της προαιρέσεως ενεκα
- 7 επιλινεισα! όλλ' ἐμετηστυχης εν εκδ ευθυνοις
- 8 οὖν καὶ τοι. εἰ τις προτοι καθαρεθηναι την
- 9 φτηνήν την θηραίοις προς ψιαί πιππον εστι κυῖαν
- 10 επιλινεισα! ψιαί πιπιω μὲν θηραίους πειρεῖν
- 11 ποδεκετιν. ἡμῖν δε συρε μαχούς είναι. αντει
- 12 τε τις αυτον επιλινεσδι καν τας κεριοτας
- 13 δωρεάς των ^{σύμπτ} προξεντι δημονι. ειτ ού δεινον
- 14 ^{εοτιν} προτοι την τυχειν τουτων δεκ οτι ούκ αν πω ~~XO~~
- 15 ἐπιλινεισειν. συσυγεσθαι ἐπει δε, ἐπραχθη
- 16 ἡράκλιοτους ψινεσθαι οὐτας καὶ μῆν κακεινο
- 17 ειλατει την ιδανος αινανοι την μησην...

Where We Began

The image shows a Microsoft Word document window titled "C2 draft.doc". On the left, there is a vertical list of numbered items from 1 to 17, which appear to be handwritten notes or a transcription of a manuscript page. The notes include words like "f 137v - 13Gr", "S12", "TOUS", "ΠΩΣ ΤΟΥΣ", "ΤΙΠΑ", "νον(τα)", "ΝΕΟ", "ΕΠΙΛΙΓΗ", "δουνα", "στηλή", "επίληψη", "ΤΟΔΕ", "ΤΕ", "Επωρέ", "ΕΟΤΙΝ", "ημιν", "ΕΠΙΛΙΓΗ", "δύνα", and "f".

The main content area of the Word document contains two columns of text, labeled "27r. col. 1" and "27r. col. 2".

27r. col. 1

1τασ <μεγιστασ εστωσαν τ>εσσαρεσ
2γρ>αμ<μαι αναλογον αι> AB Γ ΔΒ
3<και ον μεν εχει λογον α|ΒΕ ποτι>
4Ε>Α το<υ>τον ε<χετω α ΖΑ ποτι τα> τρι
5α> Ε <τασ> ΑΔ <ον δε λογον εχει α ι
6σα τ<a> B τασ AB <και Δ τασ ΒΓ> (και) ζ
7τασ ΒΔ (και) Γ τασ <ΒΕ ποτι> ταν <σα(v)
8τα Ε τασ AB και I τασ ΓΒ και I <τασ
9Β<Δ και> Ε τασ BE τουτον εχετω το(v)
10Λ>ογ<ν α Η>Ε¹ ποτι ταν ΑΔ δει<ΚΤΕΟ(v)
11(οτι) τα AZE² <δυο π>εμπτομορια³ εν
12τι τασ AB επει γαρ αναλογον εντι
13α<i> AB ΒΓ ΒΔ ΔΕ (και) αι ΑΓ ΓΔ ΔΕ
14εν τωι αυτωι Λογωι εντι και συνΑ<μ
15φοτεροις α AB ΒΓ προσ⁴ ταν B τ(ασ)
16ΒΔ εχει τον αυτον Λογο ον α ΑΔ

27r. col. 2

1ΑΔ πρ(οσ)⁵ ΗΘ τον αυτον Λογον ον α Ε
2συναμφοτερου τασ AB BE μετα τ(ασ)
31 συναμφοτερου τασ ΓΒ ΒΔ προσ⁷
4ταν> συγκειμεναν εκ τε τασ B τασ
5ΑΒ> και τασ Δ τασ <Γ>Β και τασ Γ τασ
6ΕΒ κ>α<i> ζ τασ ΒΔ ανομοιωσ δε των Λογ(ων)
7τ>ετ<αγμ>εν<ων> τουτεστιν εν τετραγ<με
8νω> α<ν>αλογια δι ισου τον αυτον Ε
9χει Λογον <?? πρ>ο⁸? ΗΘ ον AE⁹ σιναμ
10φοτερου¹⁰ τα<s AB> BE μετα τασ I τασ
11ΓΒ ΒΔ προσ¹¹ ταν → κειμεναν εκ τε τασ
12Β συναμφοτερου τασ AB B<Ε> και τα<s
13Δ συναμφοτερου τασ <ΓΒ> ΒΔ άλλα
14α¹² συγκειμενα εκ τε τασ Ε συναμφο
15τερου τασ AB BE μετα τασ I συναμφο
16τερου τασ ΓΒ ΒΔ πρ(οσ)¹³ ταν συγκειμενα(v)

Early XML Transcription Effort

```
<?xml version="1.0" encoding="UTF-8" ?>
<annotation folio="ArchX3v" x-resolution="5000" y-
resolution="7337">
<header>
<element name="Identifier">A000000000001</element>
<element name="DAT_File_Name">081v-annotation.xml</element>
<!-- ... -->
</header>
<regions>
<box id="ArchX03v1.1" upper-left-x="776" upper-left-y="759" lower-
right-x="2397" lower-right-y="876">
<text>&#925; &#954; &#969; &#957; &#959; &#965; &#969; &#963;
&#40; &#945; &#961; &#945; &#41; &#951; &#922; &#920;
&#40; &#960; &#961; &#959; &#963; &#41; &#964; &#959;
&#965; &#968; &#959; &#963; &#964; &#959; &#965; </text>
<note></note>
<!-- ... -->
</regions>
</annotation>
```

Transcription Integration Plan

- October 2007
- Unicode encoding for Greek:
 - Greek (U+0370-U+03FF), Greek Extended (U+1F00-U+1FFF) code charts
 - Unicode Normalization Form C (NFC)
- The TEI for text encoding:
 - TEI P4/EpiDoc (looking toward TEI P5, November 2007)
 - Focus on physical layout of text on parchment
 - Placeholders for figures
 - Marking non-grammatical elements (i.e., figure labels)
- Integration of metadata with transcriptions

TEI: Text Encoding Initiative

<http://www.tei-c.org/index.xml>

Mail Stuff Programming Clients post to del.icio.us my del.icio.us Share on Facebook

 <Text Encoding Initiative>

Home Guidelines Activities Tools Membership Support About News

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[Membership](#)
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TEI: Text Encoding Initiative

The Text Encoding Initiative (TEI) is a consortium which collectively develops and maintains a standard for the representation of texts in digital form. It specifies encoding methods for the humanities, social sciences and linguistics. Since 1994, the TEI Guidelines have been widely used by libraries, museums, publishers, and individual scholars to present texts for online research, teaching, and preservation. In addition to the Guidelines themselves, the Consortium provides a variety of supporting resources, including [resources for learning TEI](#), information on [projects using the TEI](#), TEI-related [publications](#), and [software](#) developed for or adapted to the TEI.

<http://www.tei-c.org/>

Transcription Integration Activities

- Since November 2007
- Digital transcription team:
 - Center for Hellenic Studies (CHS), Holy Cross, Furman University, University of Chicago
- TEI P5
- Coordination of creation of TEI transcriptions and verification by original transcribers

Transcriptions provided

- Palimpsest transcriptions:
 - J. L. Heiberg's 1910-1915 edition of Archimedes, including palimpsest reading
 - Reviel Netz & Nigel Wilson's contemporary transcription based on Heiberg and the new images
- Digital transcription:
 - Separate XML transcriptions of Heiberg and Netz-Wilson

Transcription, September 2008

081v-088r_Arch03v_TEI_Netz-Wilson.xml [/Users/dougemery/Downloads/081v-088r_Arch03v_TEI_Netz-Wilson.xml] - <oXygen/> XML Editor

XPath 2.0 - 081v-088r_Arch03v_TEI_Netz-Wilson.xml

```
199  </teiHeader>
200  <text xml:lang="grc-c">
201  <body>
202  <ab><seg n="81v1" type="folio">
203  <seg n="1" type="line">κύκλου περιφέρειαν κέντρον <choice>
204  <abbr>εχ</abbr>
205  <expans>
206  <w part="I">Εχου</w>
207  </expans>
208  </choice></seg>
209  <seg n="2" type="line"><w part="F">σαν</w> τὸ <seg type="word"><unclear>σ</unclear>αμείον</seg> δι' οὐ τῷ ἐπιπέδῳ <w part="I">Τέ</w>
210  <seg n="3" type="line"><w part="F">μνεται</w> σφαιρας ἔσται <supplied reason="lost">ά</supplied> ἐπιφάνεια.</seg>
211  </seg>
212  <seg n="81v1" type="folio">
213  <seg n="4" type="line">Ἔστω γὰρ <seg type="word">ἐπιφ<supplied reason="lost">ά</supplied>νειά</seg> τις ἢ <w part="I">τεμνομέ</w>
214  <seg n="5" type="line"><w part="F">να</w> διά τοῦ Κ <seg type="word"><unclear>σ</unclear>αμείου</seg>
215  <seg type="word">ἐπιμέ<supplied reason="lost">δ</supplied>νι</seg> ἀεὶ </seg>
216  <seg n="6" type="line">τὰν <seg type="word">τομ<unclear>ά</unclear>ν</seg> ποιοῦσα κύκλου <w part="I">περιφέ</w></seg>
217  <seg n="7" type="line"><w part="F">ρεταν,</w> κέντρον δὲ αὐτᾶς τὸ Κ. εἰ οὖν</seg>
218  <seg n="8" type="line">μη̄ ἔστιν αὐτὰ ἀ ἐπιφάνεια <choice>
219  <abbr>σφαιρ</abbr>
220  <expans>σφαιρας</expans>
221  </choice></seg>
222  <seg n="9" type="line"><seg type="word">ἐπιφάν<supplied reason="lost">ει</supplied>α,</seg> οὐκ ἔσσονται πᾶσαι</seg>
223  <seg n="10" type="line">αὶ ἀπὸ τοῦ κέντρου ποτὶ τὰν <w part="I">ἐπι</w></seg>
224  <seg n="11" type="line"><w part="F">φάνειαν</w> ποτιπόπουσαι εὐθεῖαι </seg>
225  <seg n="12" type="line">τσαι. <seg type="word">ἔσ<supplied reason="lost">τ</supplied>ν</seg> δὴ τὰ AB σαμεῖα ἐν τῇ</seg>
226  <seg n="13" type="line"><seg type="word">ἐπιφαν<supplied reason="lost">ει</supplied>αι</seg> καὶ ἄνισαι αἱ AK KB, <w part="I">δι</w>.
227  <seg n="14" type="line"><w part="F">ά</w> δὲ τῶν KA KB ἐπίπεδον <w part="I">ἐκβε</w></seg>
228  <seg n="15" type="line"><w part="F">βλήσθω</w> καὶ ποιέιν τὰν τομὰν ἐν</seg>
229  <seg n="16" type="line">τὰν ἐπιφανεῖαι τὰν <unclear>Δ</unclear>A BF <w part="I">γραμ</w></seg>
230  <seg n="17" type="line"><w part="F">μήν,</w> κύκλου ἄρα ἔστιν αὐτὰ, <choice>
231  <abbr>κεντρ</abbr>
232  <expans>κέντρον</expans>
233  </choice></seg>
234  <seg n="18" type="line">δὲ αὐτᾶς τὸ Κ ἐμει <sic>ύπόκελτο</sic> ἢ <w part="I">ἐπι</w></seg>
235  <seg n="19" type="line"><w part="F">μάνεια</w> ποιαύτα οὐκ ἔστι δὲ μνηπο</seg>
```

Text Grid Author

/Users/dougemery/Downloads/081v-088r_Arch03v_TEI_Netz-Wilson.xml U+003C 1:1

Attributes Model Stylesheet Templates Elements Entities XSLT/XQuery input

Transcription, September 2008

```
<seg n="9" type="line"><seg type="word">έπιφάν<supplied reason="lost">ει</supplied>α,</seg>
οὐκ ἔσσοῦνται πᾶσαι</seg>
<seg n="10" type="line">αὶ ἀπὸ τοῦ κέντρου ποτὶ τὰν <w part="I">έπι</w></seg>
<seg n="11" type="line"><w part="F">φάνελαν</w> ποτιπίπτουσαι εύθεῖαι </seg>
<seg n="12" type="line">ἴσαι. <seg type="word">ἔσ<supplied reason="lost">τ</supplied>ω</seg>
δὴ τὰ AB σαμεῖα ἐν τῇ</seg>
<seg n="13" type="line"><seg type="word">έπιφαν<supplied reason="lost">ει</supplied>αι</seg>
καὶ ἄνισοι αἱ AK KB, <w part="I">δι</w></seg>
<seg n="14" type="line"><w part="F">ὰ</w> δὲ τῶν KA KB ἐπίπεδον <w part="I">ἐκβε</w></seg>
<seg n="15" type="line"><w part="F">βλήσθω</w> καὶ ποιείτω τὰν τομὰν ἐν</seg>
<seg n="16" type="line">τῷι ἔπιφανείαι τὰν <unclear>Δ</unclear>Α ΒΓ <w part="I">γραμ</w></seg>
<seg n="17" type="line"><w part="F">μὴν.</w> κύκλου ἅρα ἔστιν αὐτὰ, <choice>
    <abbr>ΚΕΝΤΡ</abbr>
    <expan>κέντρον</expan>
</choice></seg>
<seg n="18" type="line">δὲ αὐτᾶς τὸ Κ ἐπεὶ <sic>ύπόκειτο</sic> ἢ <w part="I">έπι</w></seg>
```

TEI Header with Metadata

The screenshot shows the oXygen XML Editor interface with the file "017v-016r_Arch07v_TEI_Netz-Wilson.xml" open. The XML code in the main editor window is as follows:

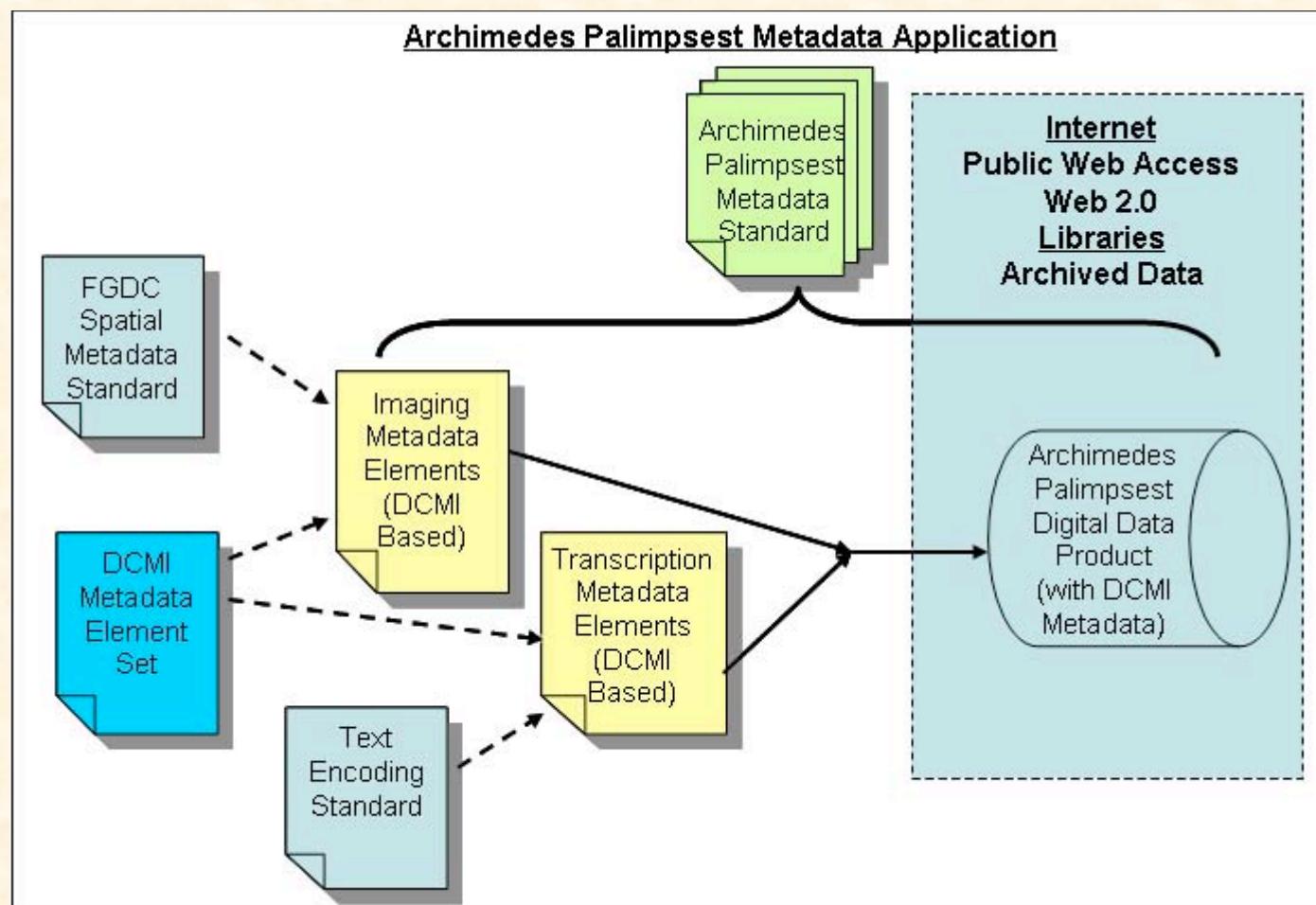
```
1 <?xml version="1.0" encoding="UTF-8"?>
2 <oxygen RNGSchema="tei-analysis-figs.rng" type="xml"?>
3 <TEI xmlns="http://www.tei-c.org/ns/1.0" xmlns:tei="http://www.tei-c.org/ns/1.0">
4   <teiHeader>
5     <fileDesc>
6       <titleStmt>
7         <title>Transcription of folios 017v-016r of the Archimedes Palimpsest. (= Archimedes folio Arch07v, On
8 Floating Bodies)</title>
9         <author>Archimedes</author>
10        <respStmt>
11          <resp>Sponsor</resp>
12          <name>The Owner of the Archimedes Palimpsest</name>
13        </respStmt>
14        <respStmt>
15          <resp>Responsible for primary transcription (Dublin Core creator)</resp>
16          <name>Reviel Netz</name>
17        </respStmt>
18        <respStmt>
19          <resp>Responsible for primary transcription (Dublin Core creator)</resp>
20          <name>Nigel Wilson</name>
21        </respStmt>
22        <respStmt>
23          <resp>Contributor</resp>
24          <name>Mike Toth</name>
25        </respStmt>
26        <!-- ... -->
27      </titleStmt>
28      <publicationStmt>
29        <idno>5186</idno>
          <publisher>Owner of the Archimedes Palimpsest</publisher>
```

The right side of the interface features a vertical toolbar with tabs for Attributes, Model, Stylesheet Templates, Elements, Entities, and XSLT, with the "Elements" tab currently selected. The bottom status bar shows the file path and some metadata.

DC to TEI Header Mapping

- dc:creator
 - teiHeader/fileDesc/titleStmt/author
- dc:contributor
 - teiHeader/fileDesc/titleStmt/respStmt/resp
 - teiHeader/fileDesc/titleStmt/respStmt/name
- dc:identifier
 - teiHeader/fileDesc/publicationStmt/idno
- dc:publisher
 - teiHeader/fileDesc/publicationStmt/publisher
- ...

Metadata Architecture



The Archive

<http://www.archimedespalimpsest.net/>

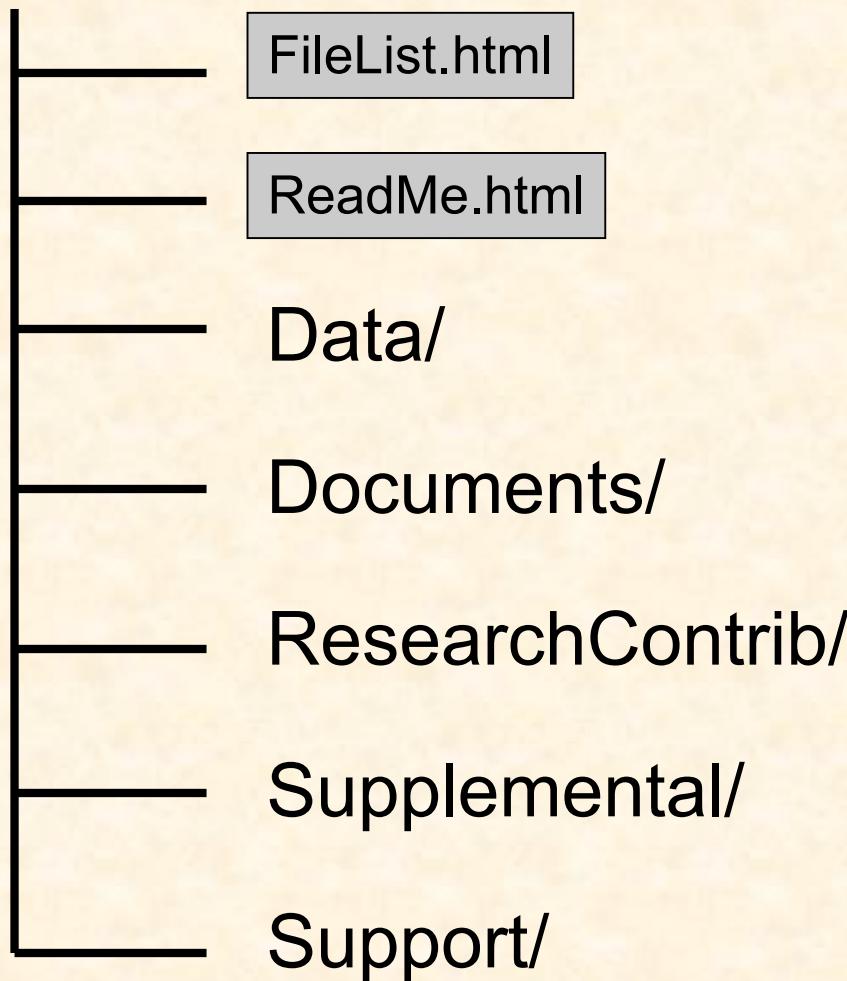
The screenshot shows a web browser window with the title "Archimedes Palimpsest". The address bar contains the URL "http://www.archimedespalimpsest.net/". Below the address bar is a toolbar with various icons. The main content area has a red header bar with the text "THE ARCHIMEDES PALIMPSEST". On the left side, there is a sidebar with a dark blue background containing links: "The Palimpsest", "Conservation", "Imaging", "Scholarship", "Program Management", "Digital Palimpsest", "Image Bank", "Archimedes Forum", "Press", "About Archimedes", and "Home". The main content area displays a table titled "THE ARCHIMEDES PALIMPSEST PROJECT: DIGITAL PRODUCT". The table has columns for "Name", "Last modified", "Size", and "Description". The table lists several files and directories:

Name	Last modified	Size	Description
0_ReadMe.html	21-May-2008 20:26	21K	
0_ReadMe.txt	21-May-2008 20:26	13K	
1_FileList.html	22-May-2008 07:49	1.3M	
1_FileList.txt	21-May-2008 22:59	445K	
Data/	06-Sep-2008 14:03	-	
Documents/	19-May-2008 06:18	-	
ResearchContrib/	21-May-2008 20:31	-	
Supplemental/	23-May-2008 17:55	-	
Support/	21-May-2008 20:31	-	

Top of page

Archive Layout

/ [root]



The Data Directory

	<u>Name</u>	<u>Last modified</u>	<u>Size</u>
	<u>Parent Directory</u>		-
	<u>0000-100r.tgz</u>	26-Jun-2008 15:06	1.7G
	<u>0000-100r/</u>	06-Sep-2008 15:26	-
	<u>0000-100v/</u>	06-Sep-2008 15:26	-
	<u>0000-171r/</u>	06-Sep-2008 14:03	-
	<u>0000-171v/</u>	06-Sep-2008 14:02	-
	<u>002r-001v/</u>	06-Sep-2008 14:02	-
	<u>002v-001r/</u>	06-Sep-2008 14:01	-
	<u>003r-006v/</u>	06-Sep-2008 14:02	-
	<u>003v-006r/</u>	06-Sep-2008 14:01	-
	<u>004r-005v/</u>	06-Sep-2008 14:02	-
	<u>004v-005r/</u>	06-Sep-2008 14:01	-
	<u>010r-009v/</u>	06-Sep-2008 14:03	-
	<u>010v-009r/</u>	06-Sep-2008 14:02	-

Folio Directories

The screenshot shows a web browser window titled "Archimedes Palimpsest". The address bar displays the URL <http://isc.archimedespalimpsest.net/Data/081v-088r/>. The browser interface includes standard navigation buttons (back, forward, home, search) and social sharing links (Mail, Stuff, Programming, Clients, post to delicious, my delicious, Share on Facebook, AP, Metadata Manager). A sidebar on the left contains links to various sections: Imaging, Scholarship, Program Management, Digital Palimpsest, Image Bank, Archimedes Forum, Press, About Archimedes, and Home. The main content area is a table listing files in the specified directory. The table has columns for Name, Last modified, Size, and Description. The "Name" column lists numerous files, many of which are XRF spectra (e.g., BaBack, CaBack, FeBack, MnBack) and associated registered versions (e.g., registered.md5, registered.tif, registered.xmp) for different elements (Ba, Ca, Fe, Mn) and backscattering directions (Back, Front). Other files listed include Sinar LED365 and LED445 images (e.g., pack8.jpg, pack8.md5, pack8.tif, pack8.xmp) and their corresponding registered versions. The "Last modified" column shows dates ranging from August 2008 to September 2008, and the "Size" column indicates file sizes in kilobytes (K) or megabytes (M).

Name	Last modified	Size	Description
Parent Directory	-	-	-
081v-088rStub_Arch03v_XRF_BaBack_registered.md5	04-Sep-2008 15:24	81	
081v-088rStub_Arch03v_XRF_BaBack_registered.tif	04-Sep-2008 15:12	85M	
081v-088rStub_Arch03v_XRF_BaBack_registered.xmp	05-Sep-2008 03:50	7.3K	
081v-088rStub_Arch03v_XRF_CaBack_registered.md5	04-Sep-2008 15:24	81	
081v-088rStub_Arch03v_XRF_CaBack_registered.tif	04-Sep-2008 15:13	85M	
081v-088rStub_Arch03v_XRF_CaBack_registered.xmp	05-Sep-2008 03:50	7.3K	
081v-088rStub_Arch03v_XRF_CaFront_registered.md5	04-Sep-2008 15:24	82	
081v-088rStub_Arch03v_XRF_CaFront_registered.tif	04-Sep-2008 15:13	85M	
081v-088rStub_Arch03v_XRF_CaFront_registered.xmp	05-Sep-2008 03:50	7.3K	
081v-088rStub_Arch03v_XRF_FeBack_registered.md5	04-Sep-2008 15:24	81	
081v-088rStub_Arch03v_XRF_FeBack_registered.tif	04-Sep-2008 15:13	85M	
081v-088rStub_Arch03v_XRF_FeBack_registered.xmp	05-Sep-2008 03:50	7.3K	
081v-088rStub_Arch03v_XRF_FeFront_registered--.md5	04-Sep-2008 15:24	84	
081v-088rStub_Arch03v_XRF_FeFront_registered--.tif	04-Sep-2008 15:13	85M	
081v-088rStub_Arch03v_XRF_FeFront_registered--.xmp	05-Sep-2008 03:50	7.3K	
081v-088rStub_Arch03v_XRF_MnBack_registered.md5	04-Sep-2008 15:24	81	
081v-088rStub_Arch03v_XRF_MnBack_registered.tif	04-Sep-2008 15:13	85M	
081v-088rStub_Arch03v_XRF_MnBack_registered.xmp	05-Sep-2008 03:50	7.3K	
081v-088r_Arch03v_Sinar_LED365_01_pack8.jpg	21-Aug-2008 00:33	165K	
081v-088r_Arch03v_Sinar_LED365_01_pack8.md5	29-May-2008 15:58	77	
081v-088r_Arch03v_Sinar_LED365_01_pack8.tif	29-May-2008 15:59	254M	
081v-088r_Arch03v_Sinar_LED365_01_pack8.xmp	08-Sep-2008 05:11	12K	
081v-088r_Arch03v_Sinar_LED445_01_pack8.jpg	21-Aug-2008 00:27	114K	
081v-088r_Arch03v_Sinar_LED445_01_pack8.md5	29-May-2008 15:58	77	
081v-088r_Arch03v_Sinar_LED445_01_pack8.tif	29-May-2008 15:58	254M	

Folio Directories (contd.)

- 081v-088r_Arch03v_Sinar_LED365_01_pack8.jpg
- 081v-088r_Arch03v_Sinar_LED365_01_pack8.md5
- 081v-088r_Arch03v_Sinar_LED365_01_pack8.tif
 081v-088r_Arch03v_Sinar_LED365_01_pack8.xmp
- 081v-088r_Arch03v_Sinar_LED445_01_pack8.jpg
- 081v-088r_Arch03v_Sinar_LED445_01_pack8.md5
- 081v-088r_Arch03v_Sinar_LED445_01_pack8.tif
 081v-088r_Arch03v_Sinar_LED445_01_pack8.xmp
- 081v-088r_Arch03v_Sinar_LED470_01_pack8.jpg
- 081v-088r_Arch03v_Sinar_LED470_01_pack8.md5
- 081v-088r_Arch03v_Sinar_LED470_01_pack8.tif
 081v-088r_Arch03v_Sinar_LED470_01_pack8.xmp
- 081v-088r_Arch03v_Sinar_LED505_01_pack8.jpg

Folio Directory Integration

- All core images of a folio side with integrated metadata:
 - Raw: spectral images, raking light, tungsten
 - Processed pseudo-color, normalized UV, “sharpie,” true color
 - XRF and/or Heiberg, if available
- XMP metadata sidecar files for all images
- TEI P5 Netz-Wilson transcription with integrated metadata
- MD5 checksums for all data files
- Registered images

Supplemental

The screenshot shows a web browser window with the following details:

- Address Bar:** Archimedes Palimpsest, http://isc.archimedespalimpsest.net/Supplemental/Arcl
- Toolbar:** Standard Mac OS X toolbar with icons for back, forward, home, search, and others.
- Menu Bar:** Mail, Stuff, Programming, Clients, post to del.icio.us, my del.icio.us, Share on Facebook, and a right-pointing arrow.
- Left Sidebar (Dark Blue):**
 - The Palimpsest**
 - Conservation
 - Imaging
 - Scholarship
 - Program Management
 - Digital Palimpsest
 - Image Bank
 - Archimedes Forum
 - Press
- Main Content Area:**

THE ARCHIMEDES PALIMPSEST PROJECT: DIGITAL PRODUCT

Beta Release

Name	Last modified	Size	Description
Parent Directory		-	
FloatingBodies/	06-Sep-2008 20:35	-	
Method/	29-May-2008 18:54	-	
SphereAndCylinder/	29-May-2008 18:54	-	
SpiralLines/	29-May-2008 18:54	-	
Stomachion/	29-May-2008 18:54	-	

Internal Documentation

The screenshot shows a web browser window titled "Archimedes Palimpsest". The URL in the address bar is <http://isc.archimedespalimpsest.net/Documents/Internal/>. The page content is titled "THE ARCHIMEDES PALIMPSEST" and "THE ARCHIMEDES PALIMPSEST PROJECT: DIGITAL PRO". A sidebar on the left lists various project sections: "The Palimpsest", "Conservation", "Imaging", "Scholarship", "Program Management", "Digital Palimpsest", "Image Bank", "Archimedes forum", "Press", "About Archimedes", and "Home". The main content area displays a table of files under the heading "Beta Release".

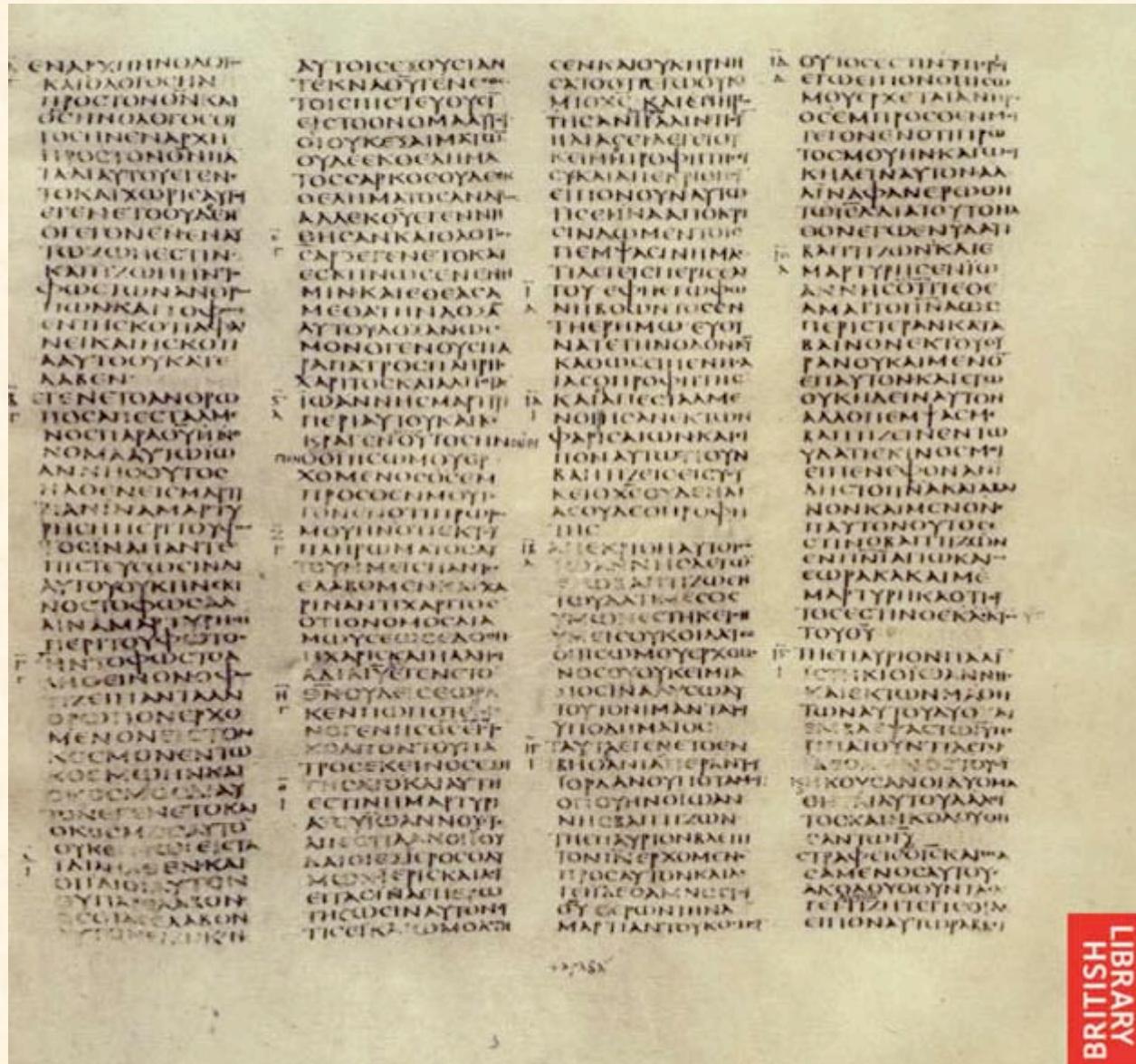
Name	Last modified	Size	Description
Parent Directory		-	
Archie 1.0.pdf	29-May-2008 18:54	444K	
FileNamingConventions.html	29-May-2008 18:54	23K	File
FileNamingConventions.txt	29-May-2008 18:54	14K	
FolioIndex.html	29-May-2008 18:54	38K	Archimed
FolioIndex.txt	29-May-2008 18:54	34K	
Image_Metadata_Standard.pdf	29-May-2008 18:54	133K	
Image_Metadata_Standard_XRF_Extensions.pdf	29-May-2008 18:54	90K	
MD5_ReadMe.txt	29-May-2008 18:54	3.9K	
Transcription_Metadata_Mapping.txt	29-May-2008 18:54	2.6K	
Transcription_Metadata_Standard.pdf	29-May-2008 18:54	130K	

External Documentation

The screenshot shows a web browser window with the title "Archimedes Palimpsest". The address bar displays the URL <http://isc.archimedespalimpsest.net/Documents/External/>. The browser interface includes standard navigation buttons (back, forward, home, search) and social sharing links (Mail, Stuff, Programming, Clients, post to del.icio.us, my del.icio.us, Share on Facebook, AP, Metadata Manager). A sidebar on the left contains links to various sections: Imaging, Scholarship, Program Management, Digital Palimpsest, Image Bank, Archimedes Forum, Press, About Archimedes, and Home. The main content area is titled "Beta Release" and features a table listing files. The table has columns for Name, Last modified, Size, and Description. The "Name" column lists the file names, many of which are underlined as links. The "Last modified" column shows all entries were modified on May 29, 2008, at 18:54. The "Size" column provides file sizes for most entries, such as 936, 389K, 142K, 609K, 774K, 31M, 34K, and 17K. The "Description" column is mostly blank or contains a single dash.

Name	Last modified	Size	Description
Parent Directory		-	
DCMI_Metadata_Terms/	29-May-2008 18:54	-	
README.txt	29-May-2008 18:54	936	
RELAX_NG_spec-20011203/	29-May-2008 18:54	-	
TIFF_Revision_6.pdf	29-May-2008 18:54	389K	
Unicode5.0/	29-May-2008 18:54	-	
XML1.0/	29-May-2008 18:54	-	
XSL1.1/	29-May-2008 18:54	-	
ZIPfileFormatSpecification_6.3.2.txt	29-May-2008 18:54	142K	
css2.txt	29-May-2008 18:54	609K	
html40.txt	29-May-2008 18:54	774K	
pdf_reference_1-7.pdf	29-May-2008 18:54	31M	
rfc1321.txt	29-May-2008 18:54	34K	
rfc5013.txt	29-May-2008 18:54	17K	

Future Opportunities



Related Projects

- International Dunhuang Project <http://idp.bl.uk/>
- Codex Sinaiticus
<http://www.codexsinaiticus.org/>
- Oxyrhynchus papyri
- Herculaneum papyri
<http://www.papyrology.ox.ac.uk/>
- The Homer Multitext Project
http://chs.harvard.edu/chs/homer_multitext
- British National Gallery Vasari Project
<http://eprints.ecs.soton.ac.uk/2238/>
- Waldseemüller Map
<http://www.loc.gov/rr/geogmap/waldexh.html>



Integrated Product - 29 Oct, 2008



All Data Available



Provide Access to Source Data

- Simple Master Data Format
- Source, Processed and Refined Data
- Standard Metadata using Dublin Core

158v. col. 1 1<>μυσμα ειλα<>σσον εκαστ>ιο<υ 2τοι δοθεντοσ στερεου μ>εγ<ε 3θουσα ..20?.. 4.. 24?.. 5.. 14?.. η<>θ<ω π>αρ< α> 6<>λληλ> ..6?.. και ..4?.. (14? 7 ..8?.. EZ <πε>ριφ< χν ε 8 .. . νησ τ ..3-4?.. <Ν>; σημει A 9 .. η = .. τουτω<ν> α 10 6?.. < B > ..5-6?.. ρ ..3-4?.. 11 κατε..τω<ν> α ..8?.. 12 ν εγγυσ πα .. λ>ου τ<η>σ KZ < α> 13Α<Β> ΓΔ <Ε>Ζ και απο τ<ων> ..6?.. 14 επι<πεδα αν>εστα<τω ορθα> (<u>προσ</u>) την EK 15 εωσ το<ν> τεμ<ν>δυντοσ επιπ<εδου απο 16 δε τ<η>γ ..2-3?.. α.η ..14?.. 17 των AB Γ<Δ E>Ζ <επιπεδα ανε 18 στατ<ν> ωρθα (προσ) <το> Ε<Ζ π< αρ<λλ>η	158v. col. 2 1σχημα τι <π>ρισμα<t>ω<ν τ>ο κατα 2την .. παρ<αλληλον> ..6-7?.. 3τ<ω>ν ..20?.. 4το κατα ..10?.. δ ..4?.. 5<ε>γγε<γ>ραφ<θω>..3-4?..ΚΟλημ 6<>υ του τητ<μιστοσ> ..10?.. 7ου και<ι> αλλα π<ε>ρ<εγερ<αφθω εκ 8π>ρισμα<t>ω<ν> ..6?.. α ..6?.. 9<>οισ αισ<γ>κειμ<ενο>ι<σ> ..4-5?.. 10θειξ<αι>ι (<u>οιτι</u>) το <πε>ρι<γ>εγ<ρ>α<μιμεν(ον)> 11σχημα του εγγεγραψι<μινου> υ 12περεχει εκ<αιστο>υ του δοθεντοσ 13<στ>ερε<ο>υ μεγεθο<υσ> <ε>πει <γ>α<ρ> το ε 14<λ>ασσ<ον> χωτ πρι<σμα>τ<ω>γ των 15ε<ν τωι> περιγερ<α>μινω σχη 16μιατι> το <>ατα <το EN παραλη>η 17<λογρα>μιουν <σ>ον εστιν τωι <ελ>α<σ> 18<σο>υ πρισματι τω<ν> ευ τωι ξ<γ>ψε 19<γραψ>μινω <>ωι κατα <το> .Φ <πα
---	--



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