Decoding cultural heritage objects
The Pencil of Nature (Cover of first fascicle)
William Henry Fox Talbot, Nicolaas Henneman, Benjamin Cowderoy, and Brown Longman
London: Longman, Brown, Green, & Longmans, 1844, 1844, 1846
Yale Center for British Art

*The Pencil of Nature (Cover of first fascicle)*

Talbot, William Henry Fox, Nicolaas Henneman, Benjamin Cowderoy, and Brown Longman

London: Longman, Brown, Green, & Longmans, 1844, 1844, 1846
The Reading Establishment, William Henry Fox Talbot & Nicolaas Henneman, 1846
Salted paper prints from paper negatives, overall 19.9 × 49.1 cm
Plates from *The Pencil of Nature*, Metropolitan Museum of Art
Prints from *The Pencil of Nature*, Yale Center for British Art
Decoding

Challenges:
- Object heterogeneity
- Rates of changes
- Study scaling & tool deployment
- Data analysis & sharing

The Object

Technique limitations:
- In-situ measurements
- Non-destructive or micro-destructive

Monitoring & Risk management

What was it?

What is it?

What is it becoming?
Posters

• Elizabeth Coquillette
  • Application of handheld Laser-Induced Breakdown Spectroscopy (LIBS) to develop quantitative calibration curves for the analysis of heritage copper alloys

• Pablo Londero
  • Portable laser ablation sampling for elemental and isotopic ICP-MS analyses

• Kate Schilling
  • Mahogany Species Identification by Thermal Desorption GC/MS

• Kate Schilling, Paul Whitmore, Rui Chen
  • Noninvasive techniques for detecting chemical changes in cultural heritage objects
What is it? *In-situ* & non-destructive spectroscopies

X-ray fluorescence spectrometers

Bruker Tracer III-SD
Handheld, large spot size

Bruker Artax micro-focus, small area mapping

Bruker M6 Jetstream: micro-focus, large area mapping
What is it? Portable non-contact imaging of surface topography

Micro-RTI (Reflectance Transformation Imaging)
What is it? Portable non-contact imaging of texture: Texturescope

High-throughput, inexpensive, repeatable, easy-to-use

Easy to replicate & deploy: Museum of Fine Arts, Houston
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Texture affinity  
Robert Mapplethorpe  
platinum and palladium prints  
1983-1989
What is it becoming? *In-situ* & non-destructive tracking of color change

Microfading tester

Stable and sensitive color measurement
Filtered visible SPD (near-UV optional)
Very high intensity focused spot (50 Suns)
Equivalent light dose ca. 1 year per minute
What is it becoming? *In-situ* & non-destructive tracking of color change

Microfading tests of *Pencil of Nature* images

Areas of highlight: bleach (paper bleaching)

Image density intensifies (darkens and becomes more neutral) - to a greater degree for darker areas
Red: Complete or significantly complete copies in six fascicles
Yellow: Significantly complete copies bound as one volume or disbound
Gray: Multiple part holdings
Light Blue: Single parts
Purple: Significant miscellaneous collections

Countries/cities with multiple holdings (total):
England: 28
Scotland: 6
NYC: 7
California: 6
Germany: 2
Contributors

• Paul Messier
• Paul Whitmore, Rui Chen
• Pablo Londero, Colette Hardman-Peavy
• Chitra Ramalingam, Yale Center for British Art

Posters

• Elizabeth Coquillette
  • Application of handheld Laser-Induced Breakdown Spectroscopy (LIBS) to develop quantitative calibration curves for the analysis of heritage copper alloys

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**What is it?** *In-situ* & micro-destructive sampling and analyses

Portable UV laser ablation sampling module

** Prototype setup with IR laser **
Yale IPCH

**Laser ablation ICP-MS instrumentation **
Institute for Geosciences, Johannes Gutenberg-Universität Mainz
What is it? *In-situ* & micro-destructive sampling and analyses

Portable UV laser ablation sampling module

Prototype setup with IR laser
Yale IPCH

**Rummer, dated 1770**
Clear flint glass (leaded) with enamel

*Probably made in Bohemia; formerly said to have been made in Manheim, Pennsylvania*
What is it? Method and data analysis development

Mahogany Species Identification by Thermal Desorption GC/MS

Application of handheld Laser-Induced Breakdown Spectroscopy (LIBS) to develop quantitative calibration curves for the analysis of heritage copper alloys

Photo: Metropolitan Museum of Art

Photo: Yale University Art Gallery
Bruker M6 Jetstream XRF: micro-focus, large area mapping
Welcome Collection

A meeting of the Royal Society at Somerset House in the Strand. Engraving by H. S. Melville, 1844, after F. W. Fairholt, 1843
Anonymous portrait miniature of John Laing. ca. 1830.
Painting on ivory, 8.8 x 6.7 cm

Portait miniature of Sir Peter Hesketh-Fleetwood, Bt., Sir William Charles Ross, 1826
Watercolor on ivory, 11.1 x 8.3 cm
View from the Window at Le Gras, Joseph Nicéphore Niépce, ca. 1826
Gernsheim Collection, Harry Ransom Center.
Bitumen on pewter, Image 11.9 x 17.8 cm

Reproduction of Joseph Nicéphore Niépce’s View from the Window at Le Gras, Helmut Gernsheim & Kodak Research Laboratory, Harrow, England, 1952
Gernsheim Collection, Harry Ransom Center.
Gelatin silver print with applied watercolor
Still Life with Casts, Louis Jacques Mandé Daguerre, 1837
Whole plate daguerreotype, approx. 16.5 x 21.5 cm
Collection of the Société Française de Photographie

Boulevard du Temple, Paris, Louis Jacques Mandé Daguerre, 1838
Daguerreotype
The Roofline of Lacock Abbey, William Henry Fox Talbot, probably 1835-1839
Salt-fixed photogenic drawing negative, 11.1 x 11.7 cm
The J. Paul Getty Museum, Los Angeles (84.XM.478.9)

Boulevard du Temple, Paris, Louis Jacques Mandé Daguerre, 1838
Daguerreotype