

Exploring the Challenges & Uses of Linked Open Data for Digitized Special Collections

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Deren Kudeki (dkudeki@illinois.edu)*

Stems from the following observations:

1. Digitized special collections are of growing importance in humanities scholarship and pedagogy.
 2. Libraries expend surprisingly few resources post-digitization.
 3. Currently digitized special collections remain in silos, hard to find & use
- After digitization, what more should we do to maximize value of collections?

Supported by a research grant from the Andrew W. Mellon Foundation



- Project Overview (Tim)
collections, current access, research questions, approach, team
- Finding links to other Web resources (Alex)
Identifying entities in the metadata, discovering links for these entities
- Metadata mapping challenges (Tim)
Image collection metadata, Kolb-Proust Archive records
- Upgrading the Motley user interface (Deren)
JSON-LD serialization, Google SDTT, enriching resource presentation



- Collections:
 - *Motley Collection of Costume and Theatre Design*
 - *Portraits of Actors, 1720 – 1920*
 - *Kolb-Proust Archive for Research*
- Selected because:
 - Well curated records
 - Encompass both scanned images & transcribed text
 - Include people, places, & event metadata
 - Many related, relevant resources on the Web





UNIVERSITY LIBRARY
UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

search

Motley Collection of Theatre and Costume Design

home:: collections:: browse:: search:: preferences:: teach:: my favorites:: help

add to favorites : reference url back to results : previous : next

(Crop this image)

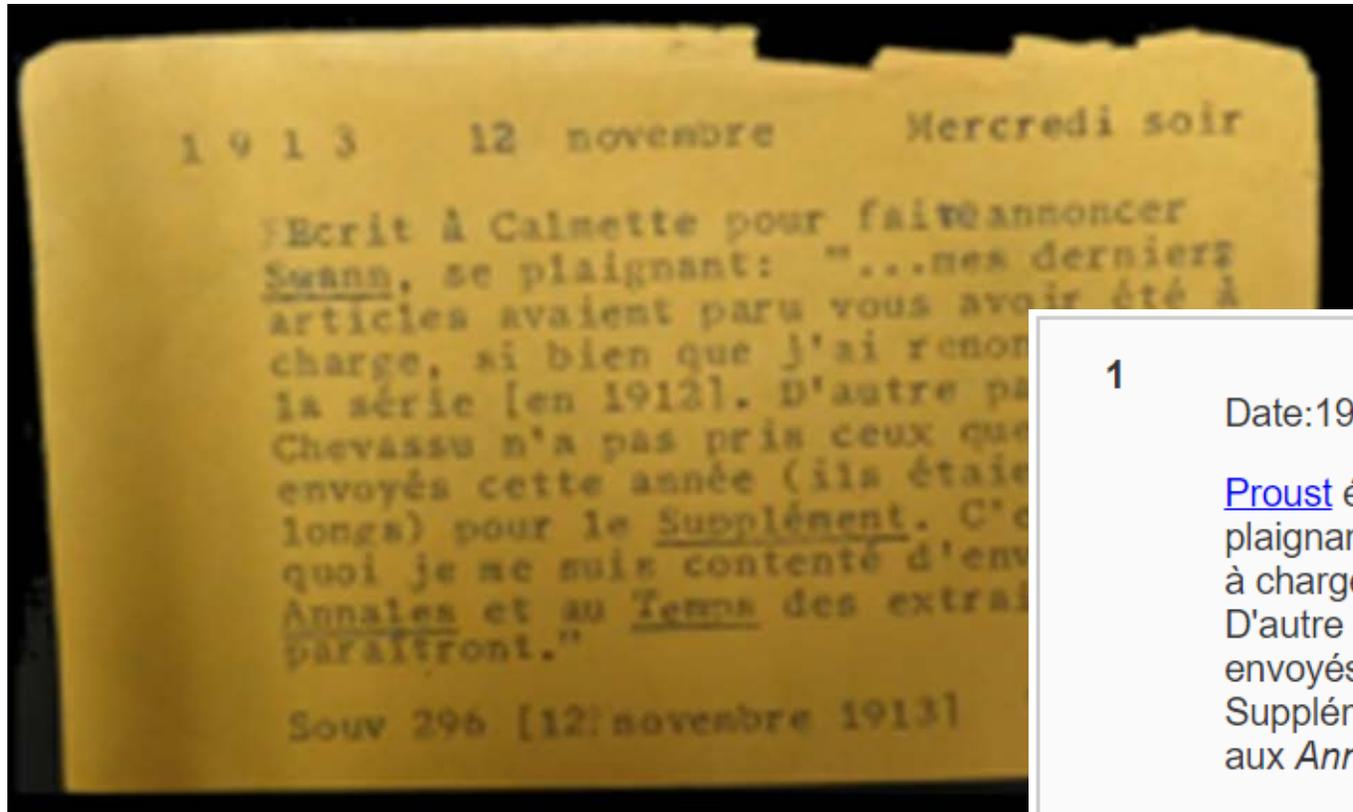
Image Title Caesar
Performance Title Julius Caesar
Author / Composer Shakespeare, William, 1564-1616
Theater Royal Shakespeare Theatre (Stratford-upon-Avon, England)
Object Costume rendering
Type Image
Material/Techniques Watercolor; Metallic; Gouache
Dimensions 11 1/2 x 15 1/4
Associated People Shaw, Glen Byam (director)
 Luckham, Cyril, 1907-1989
Subject I (AAT) costume design
 costumes (character dress)
 gouaches (paintings)
Subject II (TGMI) Theatrical productions
 Costume design drawings
 Theater--History
Subject (LCSH) Theater--History
Rights Rare Book and Manuscript Library, University of Illinois at Urbana-Champaign; For questions regarding these materials, please contact the Rare Book and Manuscript Library: <https://illinois.edu/fb/sec/7016277>
Physical Location University of Illinois at Urbana-Champaign. Rare Book and Manuscript Library
Inventory Number 570528-013
JPEG2000 URL http://varuna.grainger.illinois.edu/motley/jp2/570528_013.jp2
Collection Title Motley Collection of Theatre and Costume Design (University of Illinois at Urbana-Champaign Library)

powered by CONTENTdm @ University of Illinois at Urbana-Champaign Homepage ^ to top ^

Existing access - Motley

CONTENTdm
for
image collections

Existing access (2)



CDL's XTF for the
transcribed text of the
Kolb-Proust Research Archive

1

Date:1913 mercredi soir 12 novembre

[Proust](#) écrit à [Calmette](#) pour faire annoncer *Swann*, se plaignant: "... mes derniers articles avaient paru vous avoir été à charge, si bien que j'ai renoncé à finir la série [en 1912]. D'autre part, [M. Chevassu](#) n'a pas pris ceux que j'avais envoyés cette année (ils étaient trop longs) pour le Supplément. C'est pourquoi je me suis contenté d'envoyer aux *Annales* et au *Temps* des extraits qui y paraîtront."

à [Gaston Calmette](#), Cor XII, p. 308, n. 142 [Le mercredi soir 12 novembre 1913]

Record:c69410

Key research questions

1. What additional challenges are encountered when transforming legacy special collections research and metadata records into LOD?
 - metadata describing digitized images
 - records describing a scholar's notes and research outcomes
2. Can LOD be leveraged to help contextualize & enrich digitized special collections and provide useful links to related information resources?



1. Transform records into Linked Open Data (LOD) graphs
analyze & remediate legacy metadata, use automated & manual means to add links, apply schema.org semantics (identify needed extensions), ...
 - Goals: enrich descriptions, provide context & enhance discovery
Improve authority control, add links for context, add search engine-friendly descriptions, support more informative displays, ...
2. Add functionality to User Interface (UI)
More context, more interactive, more opportunities to understand resources, ... Assess UI qualitatively with before & after user testing.



- Principal Investigator: ***Tim Cole***
- Co-PIs: ***Myung-Ja (MJ) Han, Caroline Szylowicz***
- Lead Developer: ***Deren Kudeki***
- Project Coordinator: ***Ryan Dubnicek***
- Project PhD Students: ***Jacob Jett, Joo Ho Lee***
- Graduate Assistants: ***Alex Kinnaman, Melina Zavala***



Exploring the Challenges & Uses of Linked Open Data for Digitized Special Collections:

Adding links to other Web resources

Alex Kinnaman (kinnama2@illinois.edu)

Goal (for now) is connectedness & context

- Linked Open Data sources
 - Virtual International Authority File (VIAF)
 - Wikipedia / DBPedia
 - Library of Congress Name Authorities (id.loc.gov)
- Other Web Resources
 - Theatricalia.com
 - Internet Movie Database (IMDb.com)
 - Internet Broadway Database (IBDb.com)
 - Theater home pages on the Web



Methods – personal name identification

Goal: Metadata cleanup, enhancement, reconciliation

- Worked with an extracted metadata spreadsheet of 4789 items that also contain the personal names in the original metadata
- Checked each individual collection item for personal names that were penciled in on the renderings but not included in the digital metadata
- Cross-checked spreadsheet with potential personal names
- Ensure that people fit in the theatre context, e.g. were an actor, director, composer, etc., through manual search process
- Added and corrected personal names in metadata spreadsheet
- Over 900 personal names identified



Methods – Personal names manual search process used

Goal: Find 2+ online sources, preferably LOD, that reasonably confirm the role for a personal name

- Manually searched WorldCat Identities, LoC, Wikipedia, IMDb, IBDb
- Conducted broad Google search
 - With first/last name, birth/death years
 - With first/last name, keyword “actor,” “actress,” or “theatre”
- Pulled sources based on affiliation with theatres and well-known theatre people, time period, and inclusion on theatre cast/crew lists
- Important to note that these methods are feasible for a well-curated collection of this size, but not necessarily for all digital collections



Finding links for persons

Total identified = 984 (preliminary) Links were found for 624 names	Persons
having Wikipedia / DBPedia links	311 (32%)
having VIAF links	218* (22%)
found by searching viaf.org directly	87
found by searching LC Name Authority File	196
found by searching WorldCat Identities	93
having Theatricalia links	475 (48%)
having IMDb links	353 (36%)
having IBDb links	42 (4%)
having more than 1 link	446 (45%)

* VIAF links for 476 names (364 additional) were found using VIAF Auto Suggest API.



Finding links for venues (theaters)

Total identified = 59 (preliminary) Links were found for 52	Venues
having Wikipedia / DBPedia link	49 (83%)
having VIAF link	45 (76%)
having home page link	36 (61%)
having other link(s)	16 (27%)
having more than 1 link	47 (80%)

Finding links for performances

Total identified = 127 (preliminary) Links were found for 105	Performance Titles
having Wikipedia / DBPedia link	95 (75%)
having Theatricalia link	45 (35%)
having other link(s)	10 (8%)
having more than 1 link	44 (35%)

- Personal names: LoC, Wikipedia, IMDb, IBDb, WorldCat Identities
- Theatres & performances: Theatricalia, IBDb, Wikipedia
- Easiest to start in WorldCat to find links to other controlled vocabularies quickly, then Google
- Googling with full names and birth/death dates usually not effective, need an additional keyword instead
- Benefits of manual search: Different name spellings/maiden names/nicknames, slightly different birth/death dates, and looking for contextual clues



- Tasks
 - Cleanup
 - Enhancement
 - Reconciliation
 - Link collection
- Metadata Extraction Spreadsheet: 4789 items, over 900 names
- Time: 6 months graduate hourly work at 10-12hrs/week = ~240 hours



- Link collection for Portraits of Actors (PoA)
- Began with automatic collection for personal names and is being filled in with manual collection
- Easier to work with a set list than to create your own list, but this was not possible for Motley
- More difficult to find as many sources as Motley because the people associated with this collection are generally older





Exploring the Challenges & Uses of Linked Open Data for Digitized Special Collections:

Metadata mapping challenges

Timothy W. Cole (t-cole3@Illinois.edu)

Motley mapping – design principles

- Task: migrate flat, customized Dublin Core to Semantic Web – friendly RDF
 - Selection of schema.org vocabulary
 - Already being used by OCLC and Web search engines
 - Expressive enough to preserve (almost all) existing metadata
 - Transformation of strings into URIs
 - VIAF identifiers for people and organizations
 - Library of Congress geo-identifiers for places
 - LCSH SKOS & Getty AAT LOD vocabularies concepts for subjects (about), etc.
- Exercise Good Linked Data Practices
 - Disambiguate the entities described in our metadata records
 - Facilitate reuse of metadata in outside contexts



Motley mapping - an image with metadata



Image Title	Caesar
Performance Title	Julius Caesar
Author / Composer	Shakespeare, William, 1564-1616
Theater	Royal Shakespeare Theatre (Stratford-upon-Avon, England)
Object	Costume rendering
Type	Image
Material/Techniques	Watercolor; Metallic; Gouache
Dimensions	11 1/2 x 15 1/4
Associated People	Shaw, Glen Byam (director) Luckham, Cyril, 1907-1989
Subject I (AAT)	costume design costumes (character dress) gouaches (paintings)
Subject II (TGMI)	Theatrical productions Costume design drawings
Subject (LCSH)	Theater--History
Rights	Rare Book and Manuscript Library, University of Illinois at Urbana-Champaign; For questions regarding these materials, please contact the Rare Book and Manuscript Library: https://illinois.edu/fb/sec/7016277
Physical Location	University of Illinois at Urbana-Champaign. Rare Book and Manuscript Library
Inventory Number	570528-013
JPEG2000 URL	http://varuna.grainger.illinois.edu/motley/jp2/570528_013.jp2
Collection Title	Motley Collection of Theatre and Costume Design (University of Illinois at Urbana-Champaign Library)

What the CONTENTdm metadata actually describes



Linked Data
Adds Context

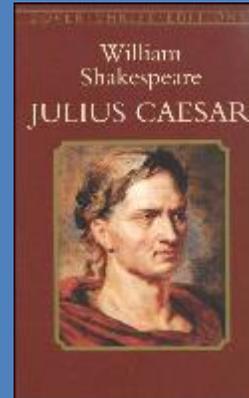
Costume design by Motley



For a stage production
directed by Glen Byam Shaw



Performed at the
Royal Shakespeare Theater



Of a play by
William
Shakespeare





CONTENTdm Website

Home Browse All Log in Help English

Search [] Search Advanced Search Results 14 of 146

Home » [Notes Collection of Theatre and Costume Design \(New\)](#) » Caesar

References URL Add tags Comment Rate ☆☆☆☆

External Resources

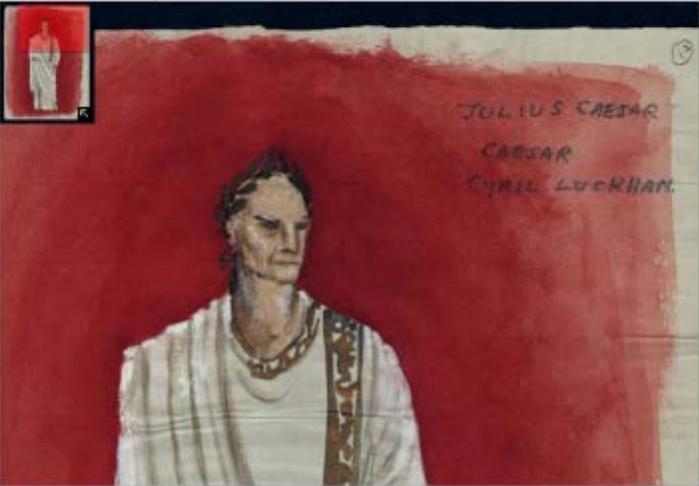
- Julius Caesar (play)**

The Tragedy of Julius Caesar is a tragedy by William Shakespeare, believed to have been written in 1599. It is one of several plays written by Shakespeare based on true events from Roman history, which also include Coriolanus and Antony and Cleopatra, although [more from Wikipedia] DBPedia Theatricalia Theatricalia
- William Shakespeare (Author)**
- Glen Byam Shaw (Director)**
 - Gender: male
 - Glencairn Alexander "Glen" Byam Shaw, CBE (13 December 1904 – 29 April 1986) was an English actor and theatre director, known for his dramatic productions in the 1950s and his operatic productions in the 1960s and later. [more from Wikipedia] DBPedia VIAF Record OMB Record Theatricalia
- Luckham, Cyril (Actor)**
- Royal Shakespeare Theatre**

The Royal Shakespeare Theatre (RST) is a 1,600+ seat thrust stage theatre owned by the Royal Shakespeare Company, dedicated to the British playwright and poet William Shakespeare. It is located in the town of Stratford-upon-Avon – Shakespeare's birthplace [more from Wikipedia] DBPedia VIAF Record WorldCat Identifies Other Other
- Motley (Organization)**

Caesar [Download] [Print]

View Description



Description

Rating	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 Based on 0 ratings
Image Title	Caesar
Performance Title	Julius Caesar
Theater	Royal Shakespeare Theatre (Stratford-upon-Avon, England) ¹²
Author	Shakespeare, William, 1564-1616 ¹⁰
Associated People (Director)	Shaw, Glen Byam, 1904-1986 ¹⁷
Associated People (Actor)	Luckham, Cyril, 1907-1969
Object	Costume rendering
Type	Image
Material/Techniques	Watercolor Gouache Metallic
Dimensions	11 1/2 x 15 1/4

Enhanced display using RDF (json-ld) metadata embedded in page

Boxes are added in left column to display links and information retrieved from LOD services

Properties of the sketch, a schema: VisualArtwork

External Resources

- ▶ [Julius Caesar \(play\)](#)
- ▶ [William Shakespeare \(Author\)](#)
- ▶ [Glen Byam Shaw \(Director\)](#)
- ▶ [Luckham, Cyril \(Actor\)](#)
- ▶ [Royal Shakespeare Theatre](#)
- ▼ [Motley \(Organization\)](#)

Motley was the name of the theatre design firm made up of three English designers, sisters Margaret Harris (known as "Percy") (1904–2000) and Sophie Harris (1900–1966), and Elizabeth Montgomery Wilmot (1902–1993). The name derives from the word 'Motley' [\[more from Wikipedia\]](#)

[DBPedia](#)
[VIAF Record](#)

Links are also provided (in description) to external authorities, Web pages and scanned media

▼ Description

Rating 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 Based on 0 rating(s)

Image Title Caesar

Performance Title Julius Caesar

Theater Royal Shakespeare Theatre (Stratford-upon-Avon, England) [↗](#)

Author Shakespeare, William, 1564-1616 [↗](#)

Associated People (Director) Shaw, Glen Byam, 1904-1986 [↗](#)

Associated People (Actor) Luckham, Cyril, 1907-1989

Object Costume rendering

Type Image

Material/Techniques Watercolor
Gouache
Metallic

Dimensions 11 1/2 x 15 1/4

Subject I (AAT) [costume design ↗](#)
[costumes \(character dress\) ↗](#)
[gouaches \(paintings\) ↗](#)

Subject II (TGMI) [Theatrical productions ↗](#)
[Costume Design drawings ↗](#)

Subject (LCSH) [Theater--History ↗](#)

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Physical Location University of Illinois at Urbana-Champaign. Rare Book and Manuscript Library

Inventory Number 570528-013

JPEG URL http://imagesearch-test1.library.illinois.edu/motley/jpg/570528_013.jpg

Collection Title Motley Collection of Theatre and Costume Design (University of Illinois at Urbana-Champaign Library)

RDF <http://imagesearch-test1.library.illinois.edu/jsonld/7532.json>



Field Name	Mapping to schema.org – schema:VisualArtwork
Image Title	schema:name (Text)
Design by	schema:creator (schema:Organization) [always Motley in this case]
Object	schema:genre (Text)
Type	schema:artform (Text or URL)
Material/Techniques	schema:artMedium (Text or URL)
Dimensions	schema:height & schema:width
Subject I (AAT)	schema:about (URL from vocab.getty.edu)
Subject II (TGMI)	schema:about (URL from id.loc.gov)
Subject III (LCSH)	schema:about (URL from id.loc.gov)
Rights	schema:copyrightHolder (schema:Organization or schema:Person)
Physical Location	schema:provider (schema:Organization or schema:Person)
JPEG 2000 URL	schema:associatedMedia (schema:ImageObject, URL)
Collection Title	schema:isPartOf (schema:Collection)

Julius Caesar (play)

The Tragedy of Julius Caesar is a tragedy by William Shakespeare, believed to have been written in 1599. It is one of several plays written by Shakespeare based on true events from Roman history, which also include Coriolanus and Antony and Cleopatra. Although [\[more from Wikipedia\]](#)
[DBPedia](#)
[Theatricalia](#)
[Theatricalia](#)

William Shakespeare (Author)

Glen Byam Shaw (Director)

Luckham, Cyril (Actor)

Royal Shakespeare Theatre

The Royal Shakespeare Theatre (RST) is a 1,040+ seat thrust stage theatre owned by the Royal Shakespeare Company dedicated to the British playwright and poet William Shakespeare. It is located in the town of Stratford-upon-Avon – Shakespeare's birthplace [\[more from Wikipedia\]](#)
[DBPedia](#)
[VIAF Record](#)
[WorldCat Identities](#)
[Other](#)
[Other](#)
[Other](#)

Motley (Organization)

Performance and venue entities referenced

Description	
Rating	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 Based on 0 rating(s)
Image Title	Caesar
Performance Title	Julius Caesar
Theater	Royal Shakespeare Theatre (Stratford-upon-Avon, England) ↗
Author	Shakespeare, William, 1564-1616 ↗
Associated People (Director)	Shaw, Glen Byam, 1904-1986 ↗
Associated People (Actor)	Luckham, Cyril, 1907-1989
Object	Costume rendering
Type	Image
Material/Techniques	Watercolor Gouache Metallic
Dimensions	11 1/2 x 15 1/4
Subject I (AAT)	costume design ↗ costumes (character dress) ↗ gouaches (paintings) ↗
Subject II (TGMI)	Theatrical productions ↗ Costume Design drawings ↗
Subject (LCSH)	Theater--History ↗
Rights	Rare Book and Manuscript Library, University of Illinois at Urbana-Champaign; For questions regarding these materials, please contact the Rare Book and Manuscript Library: https://illinois.edu/fb/sec/7016277 ↗
Physical Location	University of Illinois at Urbana-Champaign. Rare Book and Manuscript Library
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Collection Title	Motley Collection of Theatre and Costume Design (University of Illinois at Urbana-Champaign Library)
RDF	http://imagesearch-test1.library.illinois.edu/jsonld/7532.json



Field Name	Mapping to schema.org – schema:isPartOf (schema:CreativeWork)
	schema:additionalType (URL) [spc:StageWork]
Performance Title	schema:name (Text)
Theater	schema:locationCreated (schema:Place)
Opening Performance Date	schema:dateCreated (Date)
Notes	schema:description (Text)

External Resources

▶ Julius Caesar (play)

▼ William Shakespeare (Author)

- Gender: male

William Shakespeare (/ˈʃeɪkspɪər/; 26 April 1564 (baptised) – 23 April 1616) was an English poet, playwright, and actor, widely regarded as the greatest writer in the English language and the world's pre-eminent dramatist. He is often called England's [more from Wikipedia]
DBPedia
VIAF Record
BNF Record
DNB Record

▼ Glen Byam Shaw (Director)

- Gender: male

Glencairn Alexander "Glen" Byam Shaw, CBE (13 December 1904 – 29 April 1986) was an English actor and theatre director, known for his dramatic productions in the 1950s and his operatic productions in the 1960s and later. [more from Wikipedia]
DBPedia
VIAF Record
DNB Record
Theatricalia

▼ Luckham, Cyril (Actor)

- Gender: male

Cyril Alexander Garland Luckham (25 July 1907 – 8 February 1989) was a British film, television and theatre actor. [more from Wikipedia]
DBPedia
VIAF Record
BNF Record
WorldCat Identities
Theatricalia
IMDb
Other

▶ Royal Shakespeare Theatre

▶ Motley (Organization)

Persons referenced

▼ Description

Rating 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 Based on 0 rating(s)

Image Title Caesar

Performance Title Julius Caesar

Theater Royal Shakespeare Theatre (Stratford-upon-Avon, England) [↗]

Author Shakespeare, William, 1564-1616 [↗]

Associated People (Director) Shaw, Glen Byam, 1904-1986 [↗]

Associated People (Actor) Luckham, Cyril, 1907-1989

Object Costume rendering

Type Image

Material/Techniques Watercolor
Gouache
Metallic

Dimensions 11 1/2 x 15 1/4

Subject I (AAT) costume design [↗]
costumes (character dress) [↗]
gouaches (paintings) [↗]

Subject II (TGMI) Theatrical productions [↗]
Costume Design drawings [↗]

Subject (LCSH) Theater--History [↗]

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RDF <http://imagesearch-test1.library.illinois.edu/jsonld/7532.json>



Field Name	Mapping to schema.org – schema:contributor (schema:Person, schema:Organization)
Associated People (...)	schema:name (Text)
(role)	schema:jobTitle (Text)

Field Name	Mapping to schema.org – schema:exampleOfWork (schema:Book)
Performance Title	schema:name (Text)
[publication date]	schema:datePublished (Date)
[part of]	schema:isPartOf (schema:CreativeWorkSeries) [when true]
Author/Composer	schema:author (schema:Person)

Add @id (URI), schema:sameAs (URI), schema:birthdate (Date), etc.
as found from LOD resources and services

Motley mapping issues

- Metadata remediation: ambiguity of CONTENTdm field names
 - Some fields conflate different kinds of entities, e.g., Author/Composer, Associated People, Subjects, Theater
- One-to-one violations: costume & set designs
 - Particular to Stage Productions (a.k.a. Stage Works)
 - Sometimes shared across multiple performances (aka Theater Events)
- What to map: decision on what to map and what not to map into LOD
 - Not all metadata is for discovery and access.
 - Should all metadata fields be mapped to schema.org semantics?



Kolb-Proust Archive mapping – design issues

- The Archive is a research output of Professor Philip Kolb
 - An annotated guide to Proust's correspondence, works, and life events
 - Links together people, events, bibliographic entities (articles, books, ...)
- Treat each card as a dataset containing
 - Mentions of person entities and citations to bibliographic items
- Special challenge: cards were encoded in TEI





The Kolb-Proust Archive for Research

Search: **plaignant** in the full text [\[X\]](#)
Calmette, Gaston (calmet1) in subject [\[X\]](#)

[RSS](#) | [Modify Search](#) | [New Search](#)

Results: 1 Item

Browse by [Facet](#) | [Title](#) | [Author](#)

Sorted by:

Page: 1

Preferred Name

- [Calmette, Gaston](#) [\[X\]](#)
- [Chevassu, Francis](#) (1)

Date

- ⊕ [1913](#) (1)

Type

- [Chronology](#) (1)

1

Date:1913 mercredi soir 12 novembre

[Proust](#) écrit à [Calmette](#) pour faire annoncer *Swann*, se plaignant: "... mes derniers articles avaient paru vous avoir été à charge, si bien que j'ai renoncé à finir la série [en 1912]. D'autre part, [M. Chevassu](#) n'a pas pris ceux que j'avais envoyés cette année (ils étaient trop longs) pour le Supplément. C'est pourquoi je me suis contenté d'envoyer aux *Annales* et au *Temps* des extraits qui y paraîtront."

à [Gaston Calmette](#), Cor XII, p. 308, n. 142 [Le mercredi soir 12 novembre 1913]

Record:c69410

TEI

```
1 <?xml version="1.0" encoding="UTF-8"?>
2 <TEI xml:id="c69410">
3   <teiHeader type="text" status="new" TEIform="teiHeader"> [12 lines]
16 <text>
17   <body>
18     <div1 id="c69410" org="uniform" part="N" sample="complete" type="card">
19       <head>
20         <date value="19131112">1913 mercredi soir 12 novembre</date>
21       </head>
22       <div2 org="uniform" part="N" sample="complete" type="subdiv">
23         <p>
24           <name key="proust1" nymRef="Proust, Marcel; pseud. Horatio">Proust</name> écrit à
25             <name key="calmet1" nymRef="Calmette, Gaston">Calmette</name> pour faire
26             annoncer <title>Swann</title>, se plaignant: "... mes derniers articles avaient
27             paru vous avoir été à charge, si bien que j'ai renoncé à finir la série [en 1912].
28             D'autre part, <name key="chevas1" nymRef="Chevassu, Francis">M. Chevassu</name>
29             n'a pas pris ceux que j'avais envoyés cette année (ils étaient trop longs) pour le
30             <emph>Supplément</emph>. C'est pourquoi je me suis contenté d'envoyer aux
31             <title level="j">Annales</title> et au <title level="j">Temps</title> des
32             extraits qui y paraîtront."</p>
33         <listBibl default="NO">
34           <bibl default="NO">à <name key="calmet1" nymRef="Calmette, Gaston">Gaston
35             Calmette</name>, Cor XII, p. 308, n. 142 [Le mercredi soir 12 novembre
36             1913]</bibl>
37         </listBibl>
38       </div2>
39     </div1>
40   </body>
41 </text>
42 </TEI>
43
```

Partial Mapping of TEI document elements

TEI	Schema
div1 @id	schema:Dataset
	schema:author < http://viaf.org/44300868 >
	schema:inLanguage "fr"
->head->date @value	schema:temporalCoverage [schema:DateTime]
->div2->p->name ->div2->note->name	schema:mentions [schema:Person]
->div2->p->title ->div2->note->title	schema:mentions [schema:CreativeWork]
->div2->(listBibl)->bibl	schema:citation [schema:CreativeWork]



Exploring the Challenges & Uses of Linked Open Data for Digitized Special Collections:

Upgrading the Motley user interface

Deren Kudeki (dkudeki@illinois.edu)

Goal: Use JavaScript to enrich HTML item display by adding additional links and data relevant to the item

- Focus on displaying info about entities associated with an item
 - People, Theaters, and Performances
- Create a JavaScript object for each entity and populate it with data
 - Local data initializes the object
 - VIAF and Wikipedia links in the local data are used to retrieve more data
- Objects vary by entity type, but all can take some common attributes
 - e.g. name, short abstract, links



JavaScript prototype for person entities

```
function PersonEntity(id, identifier, homePage, longAbstract, shortAbstract,  
  name, enWikiUrl, ViafUrl, jobTitle, gender, birthDate, deathDate) {  
  this.id = id;  
  this.identifier = identifier;  
  this.homePage = homePage;  
  this.longAbstract = longAbstract;  
  this.shortAbstract = shortAbstract;  
  this.name = name;  
  this.enWikiUrl = enWikiUrl;  
  this.ViafUrl = ViafUrl;  
  this.links = new AutomapperConfig ();  
  this.type = 'Person';  
  this.jobTitle = ( jobTitle ? jobTitle : 'Actor' );  
  this.gender = gender;  
  this.birthDate = birthDate;  
  this.deathDate = deathDate;  
  return;  
}
```



JavaScript prototype for venue (theater) entities

```
function TheaterEntity(id, identifier, homePage, longAbstract, shortAbstract,
    name, enWikiUrl, ViafUrl, address, openingYear, seatingCapacity) {
    this.id = 'theater-' + id;
    this.identifier = identifier;
    this.homePage = homePage;
    this.longAbstract = longAbstract;
    this.shortAbstract = shortAbstract;
    this.name = name;
    this.enWikiUrl = enWikiUrl;
    this.ViafUrl = ViafUrl;
    this.links = new AutomapperConfig ();
    this.type = 'PerformingArtsTheater';
    this.address = address;
    this.openingYear = openingYear;
    this.seatingCapacity = seatingCapacity;
    return;
}
```



JavaScript prototype for performance entities

```
function PerformanceEntity(id, identifier, homePage, longAbstract,
    shortAbstract, name, enWikiUrl, ViafUrl, premiere, playSubject) {
    this.id = id;
    this.identifier = identifier;
    this.homePage = homePage;
    this.longAbstract = longAbstract;
    this.shortAbstract = shortAbstract;
    this.name = name;
    this.enWikiUrl = enWikiUrl;
    this.ViafUrl = ViafUrl;
    this.links = new AutomapperConfig ();
    this.type = 'Performance';
    this.premiere = premiere;
    this.playSubject = playSubject;
    return;
}
```



- Local data read from JSON-LD embedded in HTML
 - Parse through to find entities
 - Schema.org architecture makes info discoverable to others
- Use VIAF and Wikipedia links to fetch additional information
 - Brings in data like text descriptions of entities and links
 - If a new link is VIAF or Wikipedia, we can follow that to load even more data
- Once entity object is filled with found data it is fed into master object that detects what fields are populated
- Feed master object into mustache template to build accordion that displays information about any entity



Example of JSON-LD for person entity

Person entity with an @id attribute (VIAF or Wikipedia link):

```
{
  @type: "Person",
  jobTitle: "Conductor",
  name: "Mackerras, Charles",
  @id: "http://viaf.org/viaf/51672956"
},
```

Without @id, more data is listed in the entity:

```
{
  @type: "Person",
  jobTitle: "Director",
  name: "Blatchley, John",
  birthdate: "1922",
  deathdate: "1994",
  - sameAs: [
    "http://www.imdb.com/name/nm3257641/bio",
    "http://theatricalia.com/person/25q/john-blatchley"
  ]
}
```



Enhanced user interface

CONTENTdm Website

Home Browse All Log In ? Help English

Search Search Advanced Search Results 17 of 107

Home >> Motley Collection of Theatre and Costume Design (New) >> Caesar

Reference URL Add tags Comment Rate ★★★★★

External Resources

Julius Caesar (play)

The Tragedy of Julius Caesar is a tragedy by William Shakespeare, believed to have been written in 1599. It is one of several plays written by Shakespeare based on true events from Roman history, which also include Coriolanus and Antony and Cleopatra. Although [more from Wikipedia] [DBPedia](#) [Theatricalia](#) [Theatricalia](#)

William Shakespeare (Author)

- Gender: male

William Shakespeare (/ˈʃeɪkspiər/; 26 April 1564 (baptised) – 23 April 1616) was an English poet, playwright, and actor, widely regarded as the greatest writer in the English language and the world's pre-eminent dramatist. He is often called England's [more from Wikipedia] [DBPedia](#) [VIAF Record](#) [BNF Record](#) [DNB Record](#)

[Glen Byam Shaw \(Director\)](#)

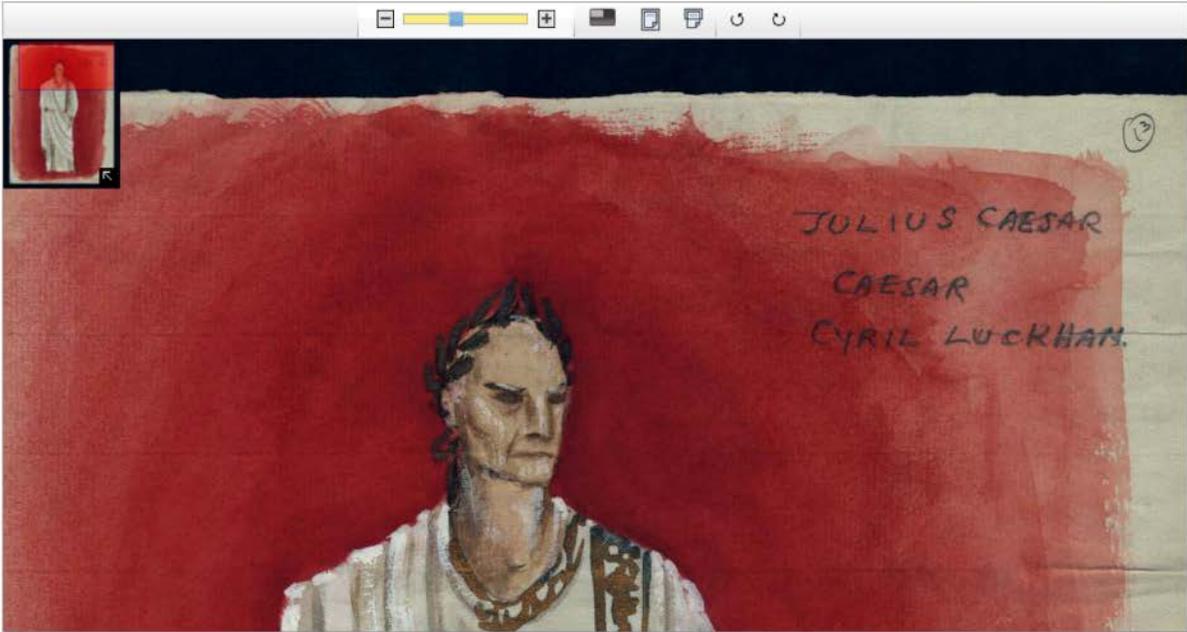
[Luckham, Cyril \(Actor\)](#)

[Royal Shakespeare Theatre](#)

[Motley \(Organization\)](#)

Caesar

[View Description](#) [Download](#) [Print](#)



Description

Rating	
Image Title	Caesar
Performance Title	Julius Caesar

Google Structured Data Tool

```
"contributor": [
  {
    "@type": "Person",
    "jobTitle": "Director",
    "name": "Glen Byam Shaw",
    "@id": "http://viaf.org/viaf/67675249",
    "sameAs": [
      "https://en.wikipedia.org/wiki/Glen_Byam_Shaw",
      "http://theatricalia.com/person/jfx/glen-byam-shaw"
    ]
  },
  {
    "@type": "Person",
    "jobTitle": "Actor",
    "name": "Luckham, Cyril",
    "birthdate": "1907",
    "deathdate": "1989",
    "@id": "https://viaf.org/viaf/19863983/",
    "sameAs": [
      "http://id.loc.gov/authorities/names/no2004077340.html",
      "https://en.wikipedia.org/wiki/Cyril_Luckham",
      "http://www.imdb.com/name/nm0524740/",
      "http://www.worldcat.org/identities/lccn-no2004-77340",
      "http://theatricalia.com/person/2ph/cyril-luckham"
    ]
  }
],
"genre": "Costume rendering",
"artform": "Image",
"artMedium": [
  "Watercolor",
  "Gouache",
  "Metallic"
],
"width": {
  "@type": "Distance",
  "name": "11 1/2 inches"
},
"height": {
  "@type": "Distance",
  "name": "15 1/4 inches"
}
```

contributor	
@type	Person
@id	http://viaf.org/viaf/67675249
jobTitle	Director
name	Glen Byam Shaw
sameAs	https://en.wikipedia.org/wiki/Glen_Byam_Shaw
sameAs	http://theatricalia.com/person/jfx/glen-byam-shaw
contributor	
@type	Person
@id	https://viaf.org/viaf/19863983/
jobTitle	Actor
name	Luckham, Cyril
sameAs	http://id.loc.gov/authorities/names/no2004077340.html
sameAs	https://en.wikipedia.org/wiki/Cyril_Luckham
sameAs	http://www.imdb.com/name/nm0524740/
sameAs	http://www.worldcat.org/identities/lccn-no2004-77340
sameAs	http://theatricalia.com/person/2ph/cyril-luckham
birthdate	1907
deathDate	1989
width	
@type	Distance
name	11 1/2 inches
height	
@type	Distance
name	15 1/4 inches
about	
@type	Thing
@id	http://id.loc.gov/authorities/subjects/sh85134531
about	

Automated link discovery

- Automatically discover VIAF links for people and theaters using Python script that calls VIAF's AutoSuggest API
 - Retrieves single results, can't judge between multiple suggestions
- **Results: 476 VIAF links found for people through automation**
 - Contrast with 218 VIAF links found manually
 - Overlap of 112 VIAF links found by both processes
 - 364 new VIAF links were found
 - Automation didn't find links for 440 people

