



# A Tree's Strength Is Its Trunk: IIF as Core Operational Infrastructure

Esmé Cowles, Princeton University  
Mark Matienzo, Stanford University

CNI Membership Meeting  
December 4, 2020



# Esmé Cowles

Princeton University Library

- ▶ our digital library ecosystem
- ▶ using IIF to integrate digital content



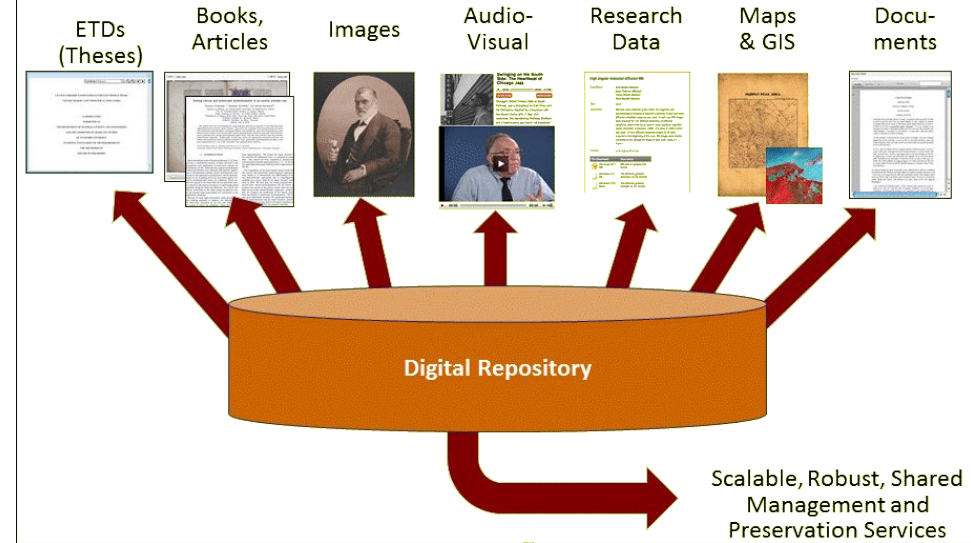
## the problem with monoliths

- ▶ long-standing software development challenge
- ▶ complexity and inter-dependency undermine sustainability
- ▶ different users with different needs

many proposed approaches for addressing these issues

# the hydra model

- ▶ one "body", many "heads"
  - ▷ body: repository/storage
  - ▷ head: different use cases



- ▶ some challenges:
  - ▷ staff and end users working in each head
  - ▷ multiple implementations of workflow, ingest
  - ▷ encourages silos: go the maps app to find maps

# trunk and branches model

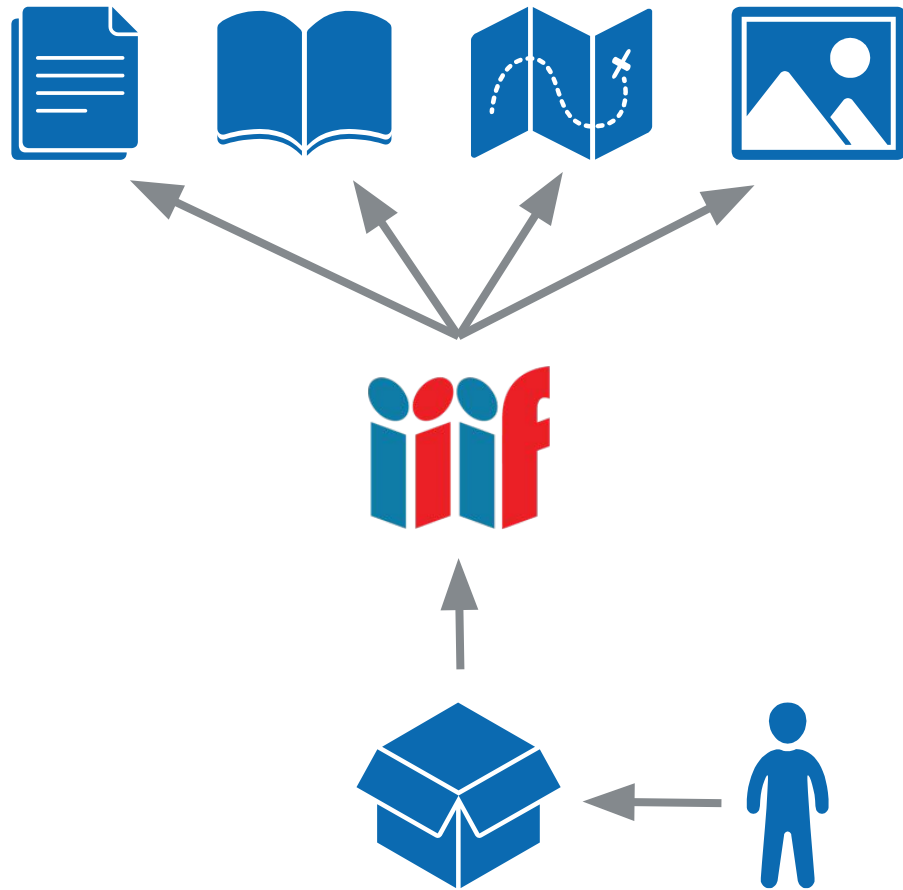
- ▶ organize applications based on audience
  - ▷ authentication, workflows, discovery criteria, scale, etc.
- ▶ base: workflows and object building funnel into one platform
- ▶ branches: discovery and access in multiple applications serving different user needs
- ▶ IIIF is the trunk that connects the base of the tree to the branches



# IIIF, what it is & how it helps

- ▶ A family of APIs for working with digital content
- ▶ IIIF Image API
  - ▷ transform images on the server
  - ▷ clients only download what they need
- ▶ IIIF Presentation API
  - ▷ combines digital content with enough metadata to build a digital object





# case study: a map of yosemite

a paper map that has been scanned, accessible in different contexts:

- ▶ Library Catalog, with other print and digital resources
- ▶ Digital Collections showcase, along with thematically-related items
- ▶ Maps Portal, along with other maps and geodata





6374507



kc16

Limit your search

Collections >

Type of Work v

Map Set 1

Subject >

Language >

State v

complete 1

Rights >

Has Structure >

Depositor >

Visibility v

Open 1

Date >

You searched for: 6374507 x

Start Over

1 entry found

Sort by relevance v

20 per page v

1. Yosemite : Wawona route via Mariposa Big Trees, Inspiration Point and Glacier Point ...



<b>Creator:</b>	Yosemite Stage and Turnpike Company	<input type="checkbox"/> Bookmark
<b>Source Metadata Identifier:</b>	6374507	
<b>Identifier:</b>	ark:/88435/0c483m816	
<b>State:</b>	complete	
<b>Call Number:</b>	HMC01.6651 and Electronic Resource	



Enter search terms



kc16 ▾

[Back to Search](#) [Start Over](#)

### Yosemite : Wawona route via Mariposa Big Trees, Inspiration Point and Glacier Point ...

Claim

side 2

CONTENTS << Yosemite : Wawona route via Mariposa Big Trees, Inspiration Point and Glacier Point ... >> MORE INFORMATION

Edit This Map Set

File Manager

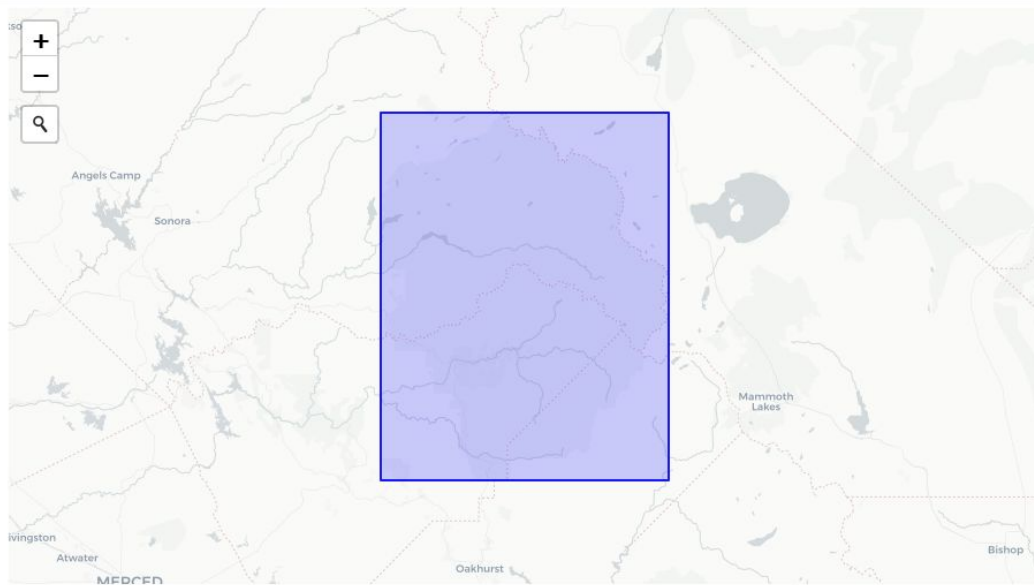
Order Manager

Structure Manager

Attach Child ▾

Delete This Map Set

Figgy



North 38.186350 East -119.199507 South 37.494842 West -119.886338

Toggle Map

<b>Collections</b>	<a href="#">Western Americana Collection</a>
<b>Rendered Links</b>	<a href="http://arks.princeton.edu/ark:/88435/0c483m816">http://arks.princeton.edu/ark:/88435/0c483m816</a> <a href="http://arks.princeton.edu/ark:/88435/vm40xv01t">http://arks.princeton.edu/ark:/88435/vm40xv01t</a>
<b>Local Fixity</b>	succeeded <b>2</b>
<b>Cloud Fixity Status</b>	succeeded <b>2</b>

Figgy

## Review and Approval

### Actions

- Complete** Published and accessible according to access control rules
- Takedown** Formerly-published but suppressed from display
- Flagged** In need of attention, but still accessible according to access rules

### Review comment

Submit

[Previous Comments](#)

## Related Resources

### Child Scanned Maps

Thumbnail	Title	Date Uploaded	Visibility	Actions
	Yosemite : Wawona route via Mariposa Big Trees, Inspiration Point and Glacier Point [side 1]	02/23/18 11:51:14 PM UTC	<b>open</b>	<a href="#">View</a> <a href="#">Edit</a> <a href="#">Detach</a>
	Yosemite : Wawona route via Mariposa Big Trees, Inspiration Point and Glacier Point [side 2]	02/23/18 11:51:16 PM UTC	<b>open</b>	<a href="#">View</a> <a href="#">Edit</a> <a href="#">Detach</a>

Figgy

Edit This Map Set

File Manager

Order Manager

Structure Manager

Attach Child ▾

Delete This Map Set

Keyword

Advanced Search

Bookmarks (0)

Course Reserves

yosemite 
Format > Map 
Subject: Topic > Yosemite National Park (Calif.)

Limit your search

Access

- In the Library 24
- Online 10

Library

Format

- Map  25

Publication year

1896 | 1944

1900 1925 1950 1975 2000

1 - 20 of 25

1. Yosemite : Wawona route via Mariposa Big Trees, Inspiration Point and Glacier Point ... [map].

Bookmark



Yosemite Stage and Turnpike Company [Browse]

San Francisco : Yosemite Stage & Turnpike Co., [ca. 1904]

MAP

**On-site access**  Special Collections - Historic Maps Collection » HMC01.6651

**Online** See the map (side 1): Digital content

2. Yosemite : Yosemite National Park, California / National Park Service, U.S. Deptment of the Interior.

Bookmark



United States. National Park Service [Browse]

[Washington, D.C.] : National Park Service, [2016]

MAP

**Available** Firestone Library - Government Documents Collection (DOCS) » I 29.6:Y

8/15/2016

3. Yosemite, CA [cartographic material]

Bookmark



[Berkeley, Calif.] : Wilderness Press, 1979.

MAP

Keyword  Search...



[Advanced Search](#)

[Bookmarks \(0\)](#)

[Course Reserves](#)

[Start over](#)

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[« Previous](#)

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10 of 26,797

[Cite](#)

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## Yosemite : Wawona route via Mariposa Big Trees, Inspiration Point and Glacier Point ... [map].

Author [Yosemite Stage and Turnpike Company \[Browse\]](#)

Format **Map**

Language **English**

Published/Created **San Francisco : Yosemite Stage & Turnpike Co., [ca. 1904]**

Description **(W 124°28'00"--W 114°07'00"/N 40°00'00"--N 32°31'00").**

**(W 122°00'00"--W 119°00'00"/N 38°32'00"--N 37°15'00").**

**3 maps on 1 sheet : col., both sides; 57 x 41 cm. or smaller, sheet 58 x 78 cm.**

### See also

[Find in other libraries](#)  
from [OCLC Worldcat.org](#)

### Available Online

See the map (side 1): [Digital content](#)

See the map (side 2): [arks.princeton.edu](#)

### Copies in the Library

Location

Call Number

Status

Special Collections - Historic Maps  
Collection

HMC01.6651

[Browse related items](#)

[On-site access](#)

[Reading Room Request](#)

[Where to find it](#)

Map title Map of Yosemite National Park, California  
Wagonroads, trails and prominent features of Yosemite Valley, California  
Route, Yosemite National Park

OCLC 228720480

International Standard  
Recording Code HM 2011-26


Other views [Staff view](#)

Navigation icons: back, forward, search (side 2), refresh, zoom in, zoom out, window, settings.

CONTENTS << Yosemite : Wawona route via Mariposa Big Trees, Inspiration Point and Glacier Point ... >> MORE INFORMATION

side 2

Sheet 9999997



Catalog

# Digital PUL

Selections from Princeton's Digital Repository

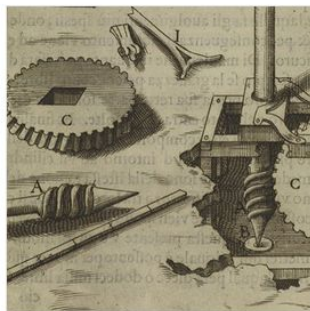
Keyword  Search...

Signed out successfully.



- All
- A Curator's Guide to DPUL
- Curated Collections Program
- Ephemera
- Library Selections
- Milberg Gallery Exhibitions
- Music & Performing Arts

### Special Collections



Building Exhibits in Digital PUL



Ho! For the Open Country



In Pursuit of the Picturesque



Gutenberg & After



Digital Collections



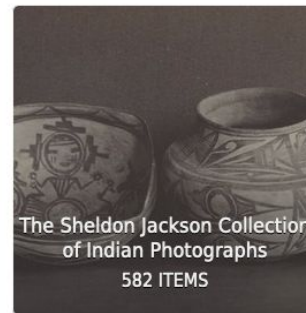
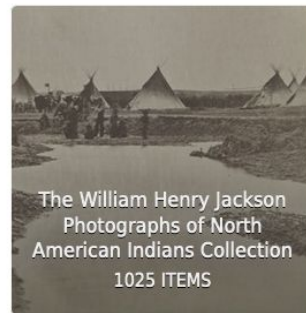
[Native American History](#)

[Mormon Americana](#)

The College of New Jersey began acquiring books and other materials about the trans-Mississippi West long before Western Americana was collectible and well before the 1890 U.S. Census announced the closing of the American frontier. Some accounts of early explorations, such as Jonathan Carver's *Travels through the Interior Parts of North America* (1784), came to the college in 1812 with the purchase of John Witherspoon's former library. The 1884 subject catalog of the college library lists several government publications on the exploration of the American West, such as John C. Frémont's *Report of the Exploring Expedition to the Rocky Mountains, Oregon, and North Carolina* (1845) and F. V. Hayden's *Annual Reports of the Geological and Geographical Survey of the Territories* (1874-1878). More notable, however, for their early inclusion in the holdings of the college are several collections of documentary photographs of the American West taken from the 1850s through the 1890s.

[Learn more](#) about the history of the Western Americana photograph collections

## Digitized Collections



Digital  
Collections





Above the clouds on Eagle Peak, Yosemite Valley, California, U.S.A. = Encima de las nubes en el pico Eagle, Valle Yosemite, California, U.S.A

Bookmark



Yo-semite Valley photographic views : falls and valley of Yo-semite in Mariposa County California / executed by C.E. Watkins, San Francisco

Bookmark



Compiled map of existing and proposed roads to Yosemite Valley, 1899

Bookmark



Yosemite : Wawona route via Mariposa Big Trees, Inspiration Point and Glacier Point ...

Bookmark



Yosemite National Park, showing boundaries established by act of Congress : approved June 11, 1906

Bookmark



Yosemite National Park, showing changes in boundaries recommended by commission appointed pursuant to act of Congress : approved April 28, 1904

Bookmark



### Browse All

See all records and filter results by dragging, zooming, or searching for locations on the map.



### Scanned Maps

Scanned historic, geoscientific, topographic, and bathymetric maps and charts.



### Vector Data

Data representing geographic features as points, lines, and polygons.



### Sanborn

Detailed building maps of cities and towns created by The Sanborn Map Company.



### Raster Data

Pixel-based data such as aerial photographs, satellite imagery, land-use maps, and elevation.

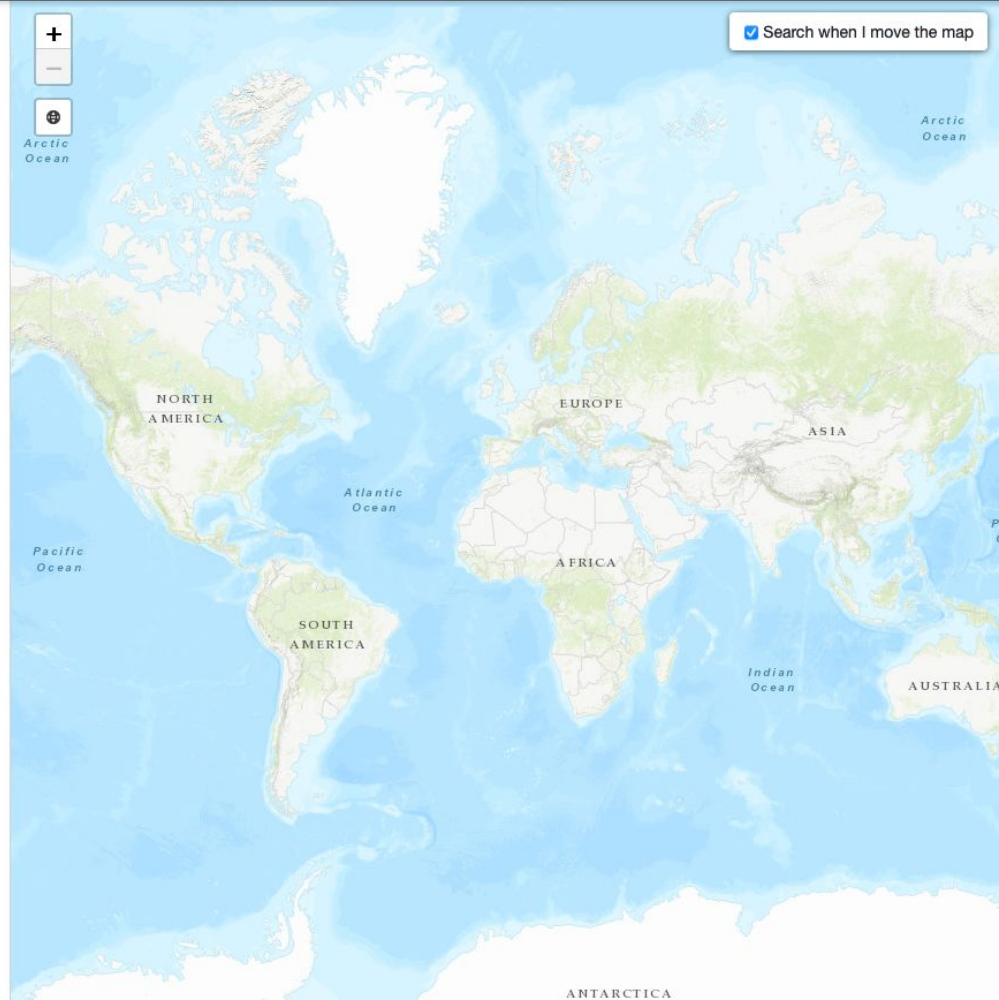


Arctic Ocean

Pacific Ocean

Atlantic Ocean

Search when I move the map



Yosemite National Park, showing changes in boundaries recommended by commission appointed pursuant to act of Congress : approved April 28, 1904. TIFF. [Washington : s.n.], 1904 (Washington : The Norris Peters Co.). princeton-r207tr66k. Relief shown by shading and spot heights. "Map 1 exhibit A." "S. Doc. 34 58 3." "To accompany report of commission dated August 31, 1904."



12. Yosemite : Wawona route via Mariposa Big Trees, Inspiration Point and Glacier Point ...

Yosemite : Wawona route via Mariposa Big Trees, Inspiration Point and Glacier Point ... San Francisco : Yosemite Stage & Turnpike Co., [ca. 1904]. princeton-0c483m816. Yosemite Stage and Turnpike Company. Relief shown by hachures and spot heights. Panel title. Insets: photographs of Yosemite. "Drawn by J.C. Henkenius." Originally issued folded to 20 ...

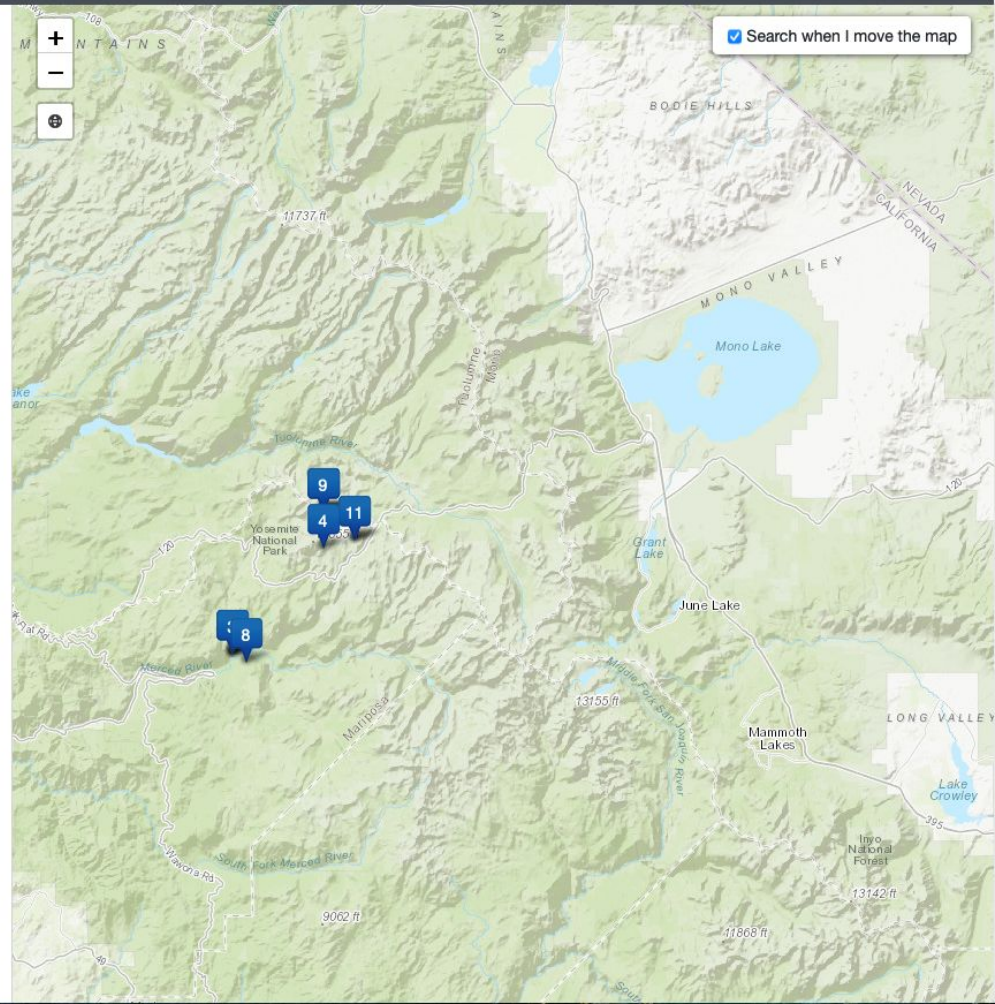


13. Compiled map of existing and proposed roads to Yosemite Valley, 1899

Compiled map of existing and proposed roads to Yosemite Valley, 1899. TIFF. [Washington? : G.P.O.?], 1899. princeton-df65v9779. Relief shown by spot heights. In upper margin: Yosemite National Park Commission 1899. In lower margin: S. Doc. 155-56-1. From: Report of the Commi...



14. A map of California with descriptive notes



# Key Benefits

- ▶ Build digital objects in one place
- ▶ Share ingest & workflow functionality
- ▶ Reuse digital content in multiple contexts to meet user needs





## Mark Matienzo

Stanford University Libraries

- ▶ our digital library ecosystem
- ▶ using IIF to integrate digital content across and beyond the institution

# IIIF as the trunk at Stanford

- ▶ Supporting evolving needs and technical concerns
- ▶ Leveraging content across and outside the organization
- ▶ Reuse across contexts



# Evolution of a “generic” viewer

- ▶ Provided by delivery environment
- ▶ Separation of concerns allows managing change in implementation and specifications
- ▶ All the while leveraging + supporting IIF







Image 1



Image 2



Image 3



Image 4



Image 1



Image 2



Image 3



Image 4

2014



 [purl.stanford.edu/fw090jw3474](http://purl.stanford.edu/fw090jw3474)

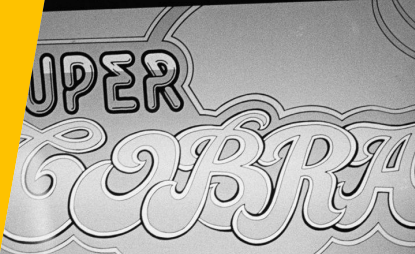




Image 1



Im



2014



2015





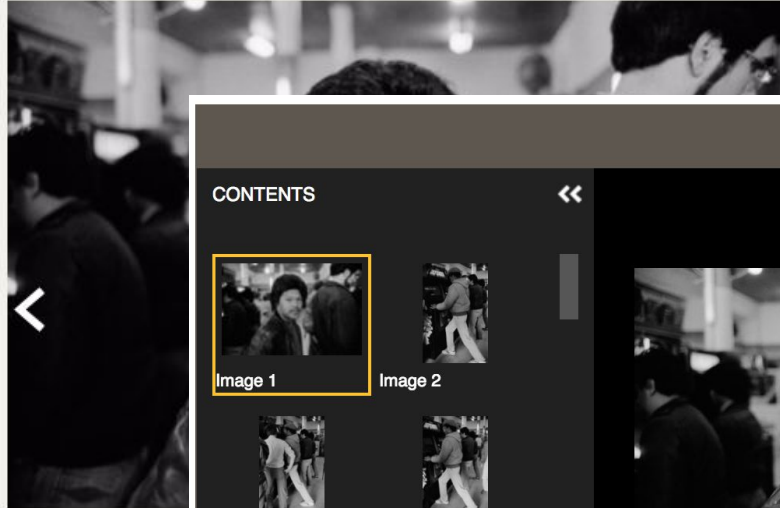
Image 1



Im



36 images



CONTENTS



Image 1



Image 2



Image 3



Image 4



ATTRIBUTION



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MORE INFORMATION



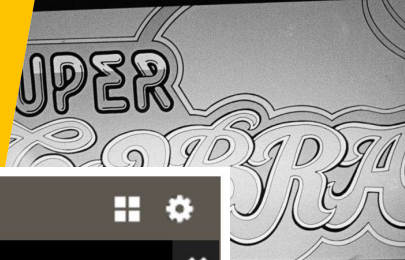
2014



2015



2017



1st Street Arcade San Francisco



Image 1



Im



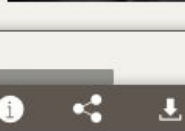
2014



2015



36 Images



2017

CONTENTS



Image 1



Image 2



Image 3

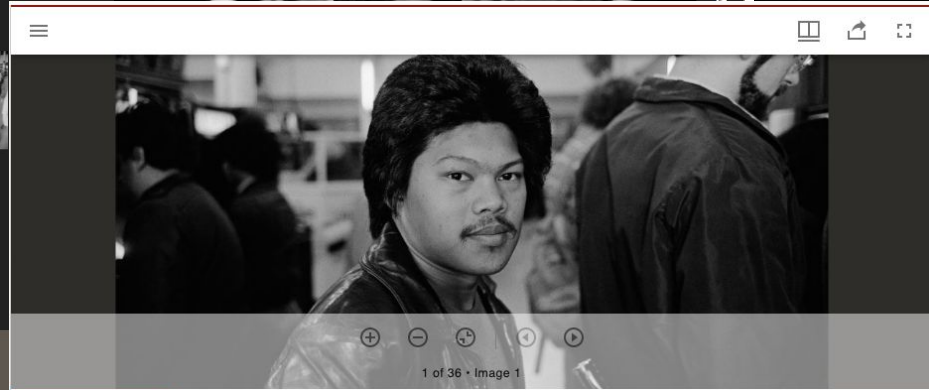
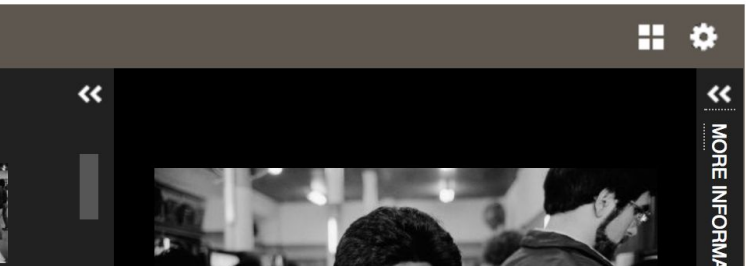
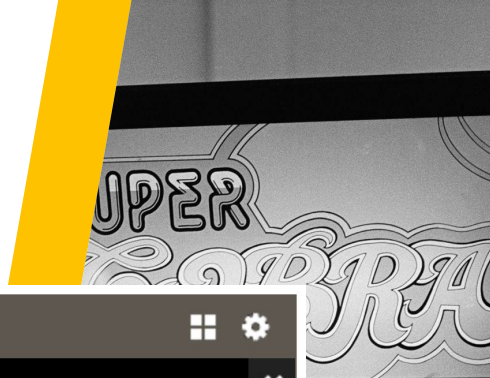


Image 4



2019

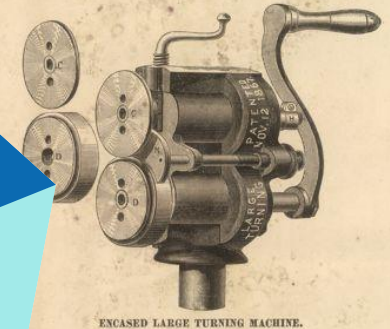
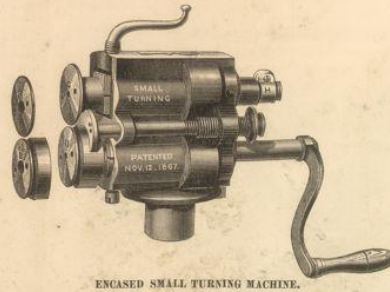
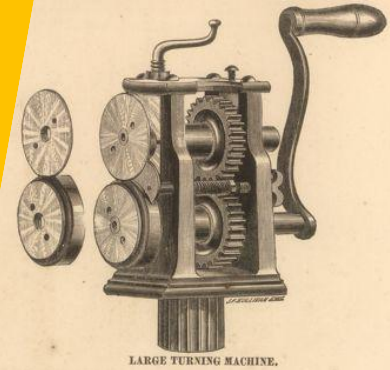
[purl.stanford.edu/fw090jw3474](http://purl.stanford.edu/fw090jw3474)



# Supporting different user needs

... means supporting viewing experiences:

- ▶ “Generic” image viewing
- ▶ Comparison
- ▶ Document viewing
- ▶ Interactive experiences (e.g. in hybrid “phygital” exhibits)



Back to results

Send to Select

# Palo Alto Cal., [Sheet] 2.

Publication [New York] : [Sanborn - Perris Map Co., Limited, 117 & 119 Broadway], Aug. 1895.

Physical descrip... 1 map.

## Digital content



Catalog

[Start Over](#) [Back to Search](#)[« Previous](#) | **5 of 8** | [Next »](#)

## Tools

 [Bookmark](#)[Citation](#)[Email](#)Palo Alto Cal  **Author(s)** [Sanborn Map Company](#)**Description** Bar scale on map given in "Feet". Compass rose indicates north toward upper left of sheet. Shows streets and buildings, some labeled according to individual rooms.**Publisher** [Sanborn - Perris Map Co., Limited, 117 & 119 Broadway]**Place(s)** [California, Palo Alto, California, Santa Clara County \(Calif.\), and Palo Alto \(Calif.\)](#)**Subject(s)** [Fire risk assessment](#)**Held by** [Stanford](#)**More details at** <https://purl.stanford.edu/tw742yr8951>**Use and reproduction** Image from the Map Collections courtesy Stanford University Libraries. This item is in the public domain. There are no restrictions on use. If you have questions, please contact Branner Earth Sciences Library & Map Collections at [brannerlibrary@stanford.edu](mailto:brannerlibrary@stanford.edu).**Copyright** This work has been identified as being free of known restrictions under copyright law, including all related and neighboring rights. You can copy, modify, distribute and perform the work, even for commercial purposes, all without asking permission.**License**  Public Domain Mark 1.0

## Embedded Content



Maps Portal

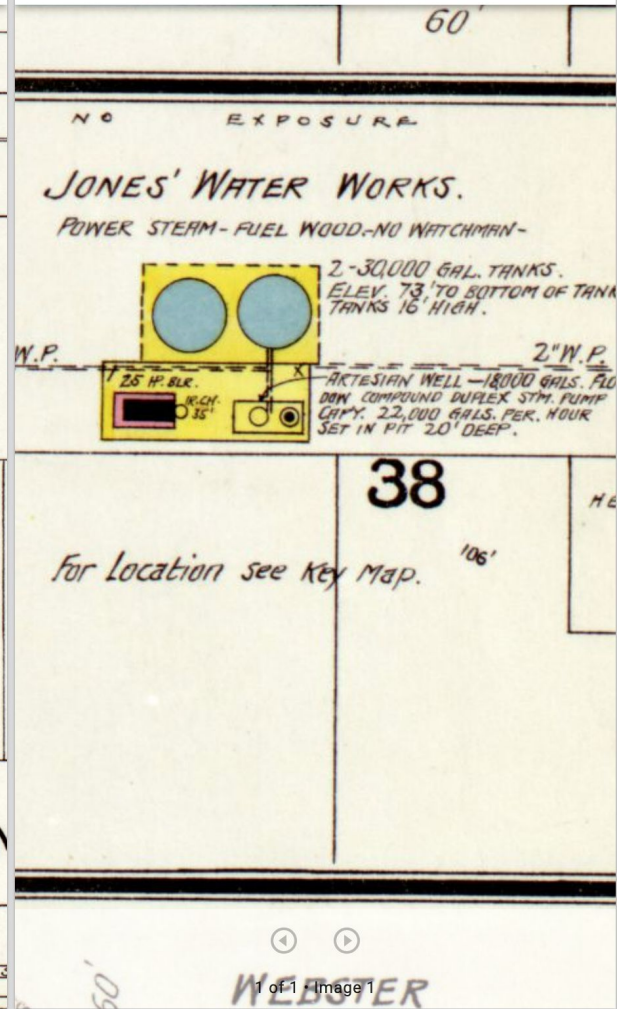
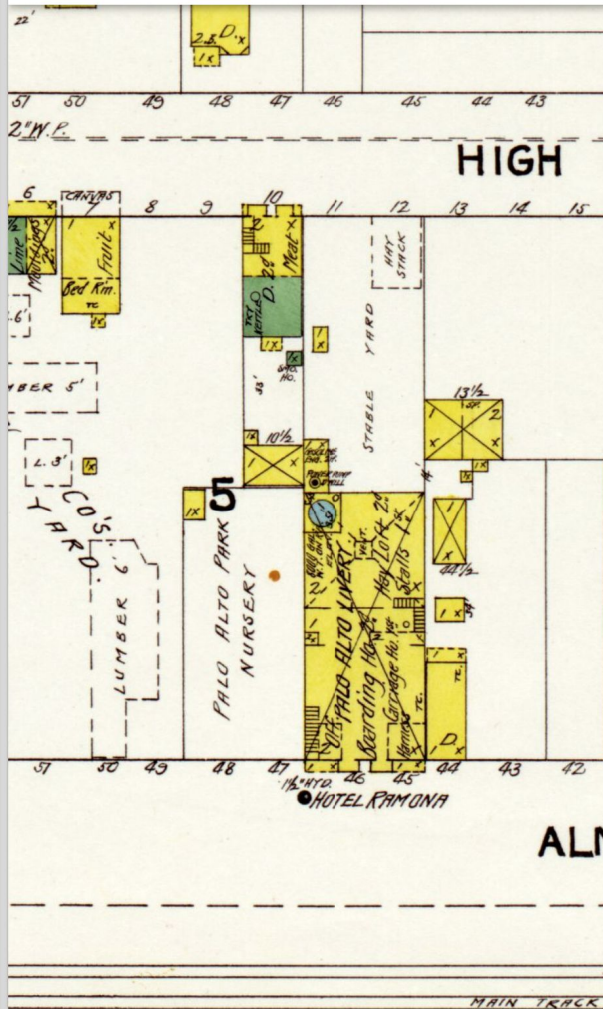


Image comparison



# Sanborn Fire Insurance Maps

HOME CURATED FEATURES ▾ BROWSE ABOUT

Everything ▾ Search...

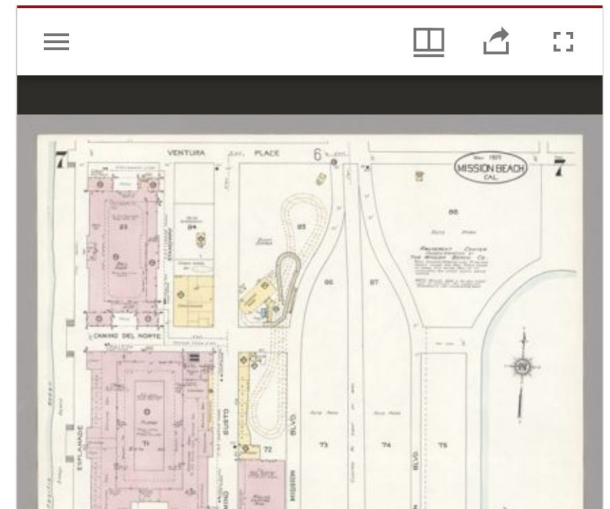


Fire insurance maps are produced to provide information to insurers about the composition and use of buildings in order to provide correct underwriting of policies. These maps, primarily produced in the United States by the Sanborn Company, are now historically important documents of the towns and cities from the start of the late 19th Century. The maps include: building footprints; building material shown by color, height and number of stories; features such as doors, windows, chimneys, and elevators; address and lot lines; uses such as dwellings, hotels, churches, and chicken coops; street widths, water pipes, hydrants, and cisterns, and occasionally the ethnicity of the occupants. These maps are now heavily used to study the history of a place by historians, genealogists, urban planners, and ethnic studies. Stanford Libraries holds maps mainly of California and has scanned those that are out of copyright.

## Mission Beach, California 1929

Mission Beach in San Diego County, California has long been a tourist destination. Mission Beach Amusement Center, shown here, was built by business mogul John D. Spreckels in 1925 in hopes of stimulating development in the area where he owned real estate. Only two structures remain from the original park, the wooden Giant Dipper roller coaster and the Natatorium. The roller coaster was restored in 1989-1990 and was designated a National Historic Landmark on July 4, 1990. The Natatorium, designed by architect Frank Walter Stevenson, was built in 1925 and originally was filled with seawater. The building had a retractable roof to allow for indoor and outdoor swimming. The Natatorium, now called The Plunge, is under restoration with an expected completion in 2019. The original park included a ballroom capable of holding 5,000 dancers, a roller skating rink, a merry-go-round, a fun house, and a "wonderland." **Belmont Park** now is a full-fledged amusement park with rides, swimming, and a boardwalk.

Online exhibits



# Parker Library On the Web

## Manuscripts in the Parker Library at Corpus Christi College, Cambridge

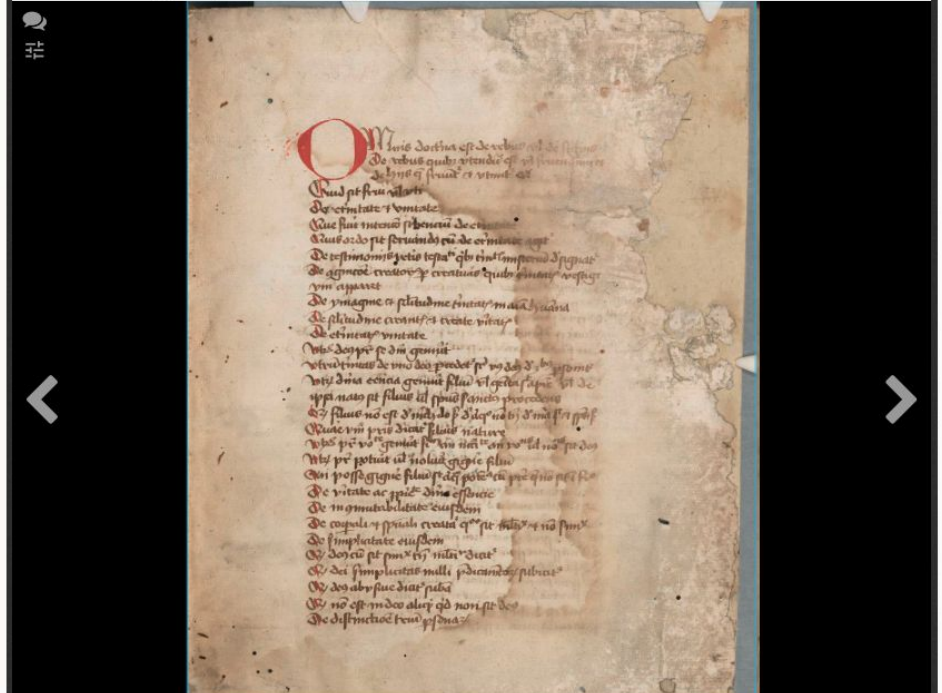
HOME CURATED FEATURES BROWSE ABOUT

Everything Search...

Home / Browse / The Elbing Manuscripts / Cambridge, Corpus Christi...

### Cambridge, Corpus Christi College, MS 522: Peter Lombard, Sententiarum libri IV. Edit

Cambridge, Corpus Christi College, MS 522: Peter Lombard, Sententiaru... f. 2r



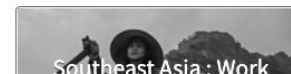
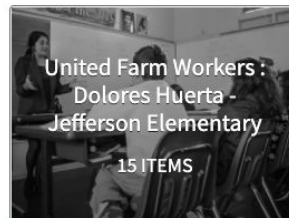
Online exhibits

# The David Bacon Photography Archive at Stanford

## Work & Social Justice

[HOME](#) [EXHIBIT](#) [BROWSE](#) [ABOUT](#)

Everything ▾ Search...

[Home](#) / [Browse](#)

Online exhibits

# Adding new features

- ▶ Searching within an item's full text
- ▶ Emerging authentication needs



## CONTENTS



6



7



8



9



trial

17/25




- 26 On 13 December 2001, the Public Prosecutor transferred to the Court a summary autopsy report on bodies exhumed in East Timor from February 16 to August 26, 2000.
- 27 On 8 February 2002, the Public Prosecutor, the accused and their legal representatives, upon being called, attended at the hearing. After opening the session, the court asked the parties whether they were ready for the **trial**, in which case the Court will go ahead with the opening statement of the Public Prosecutor. All the parties told the Court that there were ready, however, the Public Prosecutor raised the issue of submission of what kind of evidence the defense intends to present for the **trial**. The defense replied that there were still trying to meet the witnesses and looking for the evidence to submit to the Court. The Court ordered the defense to submit what kind of evidence and witnesses to present for the **trial** by the 15<sup>th</sup> February 2002. The Court postponed the **trial** hearing of the case to 22 February 2002. As 22<sup>nd</sup> February 2002 was a UN holiday, the hearing of the case was postponed on 4 March 2002.
- 28 On 15 February 2002, the defense of the 3 accused persons submitted the list of their witnesses. The Defense of Sabino Gouveia Leite submitted a list of 3 witnesses composed of Manuel Ana Rosario Da Costa, Joaquim Moniz, and Pedro Noronha.
- 29 On 25 January 2002, the Public Prosecutor submitted the original letter from Sabino Gouveia Leite to Jose Gouveia Leite dated 6 may 1999.
- 30 On 20 February 2002, the Public Prosecutor filled an application for leave to further amend the indictment against the accused persons, pursuant to Section 32 of UNTAET Regulation 2001/25. The application was reiterated during the **trial** hearing on the 4<sup>th</sup> March 2002, where the prosecutor explained the content of the motion to further amend the indictment. The Court decided to grant leave to the Public Prosecutor to amend the indictment on the 27<sup>th</sup> March 2002 and decided that the proposed amendment be part of the indictment.
- 31 The ordinary **trial** was scheduled on the 5<sup>th</sup> March 2002. It was conducted over 15 Sessions (From 5 March 2002 until 20 November 2002).
- 32 On the 5<sup>th</sup> March 2002, the Public Prosecutor delivered his opening statement and read out the indictment in an open hearing. The Defendant Sabino

Full text search





 Stanford users: log in to access all available features. [CONTINUE](#)



GRAVITY PROBE B  
MASS POSITIONING SYSTEM  
FINAL REPORT



KEVIN M. BROWN      GREG GARDNER  
Principal Investigator      Co-Principal Investigator  
Stanford University      Stanford University

MISSIONARY LARRY LORING



Authentication

# Leveraging many trunks: encouraging implementation

- ▶ Stanford Digital Repository as campus-wide service
- ▶ Other implementations on campus (e.g. Hoover Institution Library and Archives)
- ▶ Working with external resources



# Andy Warhol Photography Archive

## Contact Sheets: 1976 - 1987

[HOME](#) [BROWSE](#) [SELECTED NEGATIVES: WARHOL'S NEW YORK, 1984](#) [ABOUT](#)

Everything ▾

Search...



### Limit your search

Date &gt;

Topic &gt;

Region &gt;

From 1976 until his death in 1987, Andy Warhol (U.S.A., 1928-1987) was never without his camera. He snapped photos at discos, dinner parties, flea markets, and wrestling matches. Friends, boyfriends, business associates, socialites, celebrities, and passersby all captured Warhol's attention.

Drawing on a trove of over 3,600 contact sheets featuring 130,000 photographic exposures acquired in 2014 from The Andy Warhol Foundation for the Visual Arts, Inc., the images document Warhol's daily life. The collection features candid portraits of celebrities and artists of the era including: Jean-Michel Basquiat, Truman Capote, Jimmy Carter, Martha Graham, Halston, Keith Haring, Debbie Harry, Bianca Jagger, Grace Jones, Jackie Kennedy, Liza Minnelli, Dolly Parton, Robert Rauschenberg, Elizabeth Taylor, Diane Von Furstenberg, and more.



This collection of Warhol's contact sheets – printed thumbnails from a roll of film – represents the complete range of the American artist's black-and-white photographic practice from 1976 until his unexpected death in 1987.

Click on "Topic" in the left-hand sidebar to see a list of people, places, and subject terms in the collection.

## Campus partners using SDR



[Digital Collections](#) › [Works](#) › [Photograph of leafy tree on grassy lawn with body of water in the distance](#)

BACK

< 23 of 26 >



**Collection Structure:** [Leonid Andreyev miscellaneous papers](#) › [Color glass autochromes](#) ›  
 Photograph of leafy tree on grassy lawn with body of water in the distance

**Item Title:** Photograph of leafy tree on grassy lawn with body of water in the distance

**Collection Title:** [Leonid Andreyev miscellaneous papers](#)

**Contributor:** Andreyev, Leonid (1871-1919)

**Date Created:** 1900/1919?

**Subject(s):** [Russia](#)

**Country of Origin:** [Russia](#)

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Other implementations

## Sanborn Fire Insurance Maps

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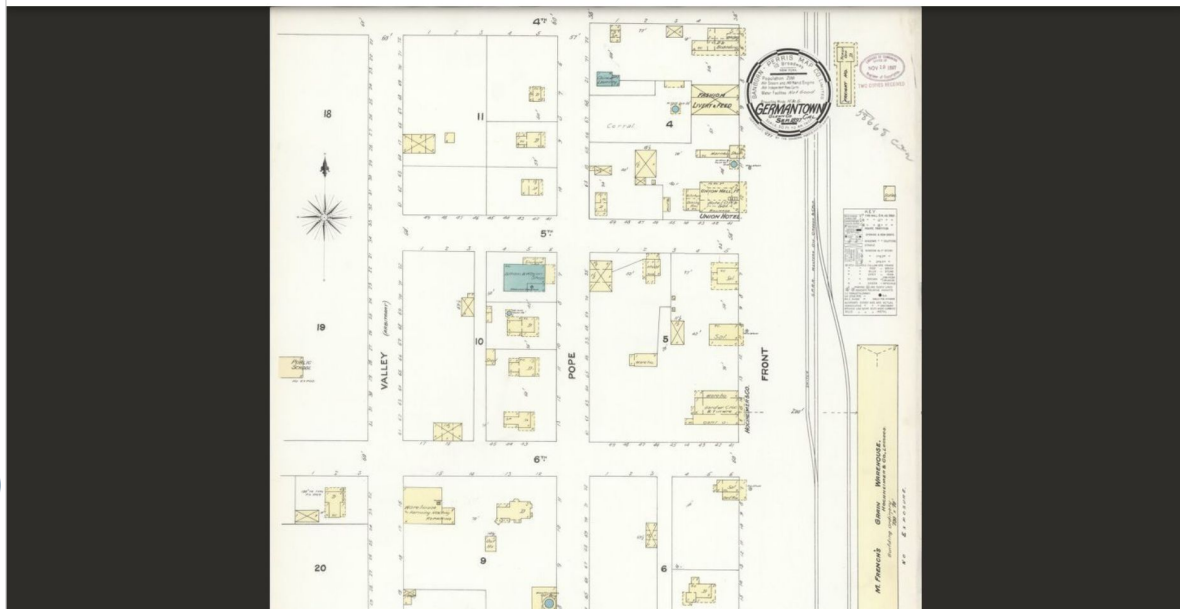
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## Sanborn Fire Insurance Map from Germantown, Glenn County, California.

Edit

Sanborn Fire Insurance Map from Germantown, Glenn County, California.



External content (from LOC)

# Reuse across contexts

- ▶ IIIF (and oEmbed) provide “seams” for content across our platforms, allowing technical and visual consistency
- ▶ Allows for a greater return on investment in digitization and platform/infrastructure development

# Thank You!

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CNI Membership Meeting

December 4, 2020