

extraMUROS :: Towards an API-Driven Multimedia Library Without Walls

*A proposal to the Harvard Library Lab
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Project Team

Core

James Burns

PhD Candidate, Department of Economics
Technology Director, Media And Place (MAP) Productions

Lucien Castaing-Taylor

John L. Loeb Associate Professor of the Humanities and of the Social Sciences, Departments of Visual and Environmental Studies and of Anthropology, FAS
Director, Film Study Center
Director, Sensory Ethnography Lab
Co-Director of Graduate Studies, Secondary Field in Critical Media Practice

Kara Oehler

Executive Director, Media And Place (MAP) Productions
Senior Producer, WNYC

Alix Reiskind

Visual Resources Librarian, Frances Loeb Library, GSD

Jeffrey T. Schnapp*

Founder, Stanford Humanities Lab
Visiting Professor of Romance Languages and Literatures, FAS
Visiting Professor of Architecture, GSD
Fellow, Berkman Center for Internet and Society
(*joining the Harvard faculty as a full professor effective 1/1/2011)

Jesse Shapins

Instructor of Architecture, Faculty of Architecture, GSD
PhD Candidate in Urbanism, Film and Visual Studies, GSD/FAS
President, Media And Place (MAP) Productions

Ann Whiteside

Librarian/Assistant Dean for Information Resources
Loeb Library, Harvard Graduate School of Design

Additional Team

Peter Bol

Director of Center for Geographic Analysis at Harvard
Harvard College Professor and the Charles H. Carswell Professor of East Asian Languages and Civilizations

Sheila Connor

Horticultural Research Archivist, Arnold Arboretum

Melissa Dollman

Audiovisual Cataloger, Schlesinger Library

Peter Galison

Joseph Pellegrino University Professor
Director, Collection of Historical Scientific Instruments

Co-Director of Graduate Studies, Secondary Field in Critical Media Practice

K. Michael Hays

Eliot Noyes Professor of Architectural Theory, GSD
Associate Dean of Academic Affairs, GSD

Ernst Karel

Lecturer in Anthropology
Assistant Director, Film Study Center
Manager, Sensory Ethnography Lab

Nancy Levinson

Editor, *Places* journal
Co-Founding Editor, Harvard Design Magazine

Ben Lewis

Senior GIS Specialist, Center for Geographic Analysis at Harvard

Randy Stern

Manager of Systems Development, Harvard University Library
Office for Information Systems

Julia Yezbick

PhD Candidate, Department of Anthropology
Co-Founder, *Sensate* journal

Project Overview

We propose an open-source HTML5 infrastructure built on public APIs that enables faculty, students, staff and the general public to collaboratively view, curate, annotate, exhibit and remix Harvard-owned digital multimedia collections and to interconnect them with other high-quality digital repositories across the web. While books (in material and digital form alike) are vital to the future of libraries, we believe that in an increasingly audiovisual world of scholarship and public discourse, it is essential that libraries play a major role in preserving, making available and providing innovative tools for interpreting society's audiovisual past, present and future across media. In the digital age, this role necessarily implies a concept of collections development, management and dissemination that reaches out beyond the brick-and-mortar boundaries of the physical library, building bridges between collections that are physically remote and/or held by partner institutions. Hence our project title: *extraMUROS*.

The label *extraMUROS* implies:

- an expansion of the traditional intramural concept of the library as an institution of memory and place of knowledge production and reproduction;
- a commitment to supporting innovative cross-media research platforms built around the triangulation of research, teaching, and scholarly communication;
- an intensified commitment to public access and public knowledge creation.

To this end, the project sets out to provide the Libraries with open-source tools with the following attributes:

- GEOLOCATION = it will enable the collaborative geoparsing of Harvard's digital media assets and the development of zoomable 2d and 3d map-based interfaces for access and navigation;
- AUGMENTATION = it will provide a model for the creation of "digital archives without walls" built on connections between intramural and extramural repositories and couplings between different media types
- CURATION = it will allow scholars and students to collaboratively create, curate, and share archival subdomains, as well as online exhibitions, slideshows, and editions combining text, digital images, audio and video;
- MULTICHANNELING = it will create a flexible pipeline that facilitates the experience of curated assets and multimedia scholarship not only online, but also in physical space by means of mobile (e.g. iPhone/Android) and tablet (e.g. iPad) devices responsive to a user's geographic location;
- TEACHING and COMMUNICATION = it will support and streamline the creation, sharing, and dissemination of web-based multimedia faculty work (lectures, curated domains, knowledge environments) and student projects combining Harvard- and non-Harvard-owned archival assets with media from across the web.

This proposal supports the Office of Information Services' strategic focus on developing novel applications based on open information streams, and responds to momentum across an extensive collaborative network at Schools, Centers and disciplines throughout the University. Specifically, our team includes faculty, staff, fellows, and students from Harvard's Berkman Center for Internet and Society; Loeb Design Library; Schlesinger Library; Graduate School of Design; Faculty of Arts and Sciences; Sensory Ethnography Lab; Film Study Center; as well as award-winning independent documentary producers and new media journalists. Moreover, this project supports a series of Harvard initiatives in the emerging context of the digital humanities, where the boundaries of research and scholarship increasingly move beyond exclusively textual form. These include: metaLAB Harvard, a

proposed new experimental space for digital humanities at the Berkman Center; a new GSAS Secondary Field in Critical Media Practice (CMP) that enables doctoral students to incorporate media-based work into their dissertations; and a proposed undergraduate concentration in Architecture + Design (A+D), which will be based on a series of studio courses that require students to incorporate archival media and maps into web and mobile-based digital narratives about specific sites.

Through this project, the Library Lab will leverage substantial existing resources and previous investments from inside and outside the University. This proposal builds on top of Zeega, an already-prototyped, open-source platform which Jesse Shapins, James Burns, Kara Oehler and Media And Place (MAP) Productions have developed over the past two years. Zeega's core method is based on hosting a dynamic database that references content across the Internet through public APIs. Instead of the database containing actual media objects, it is a map to the URLs of these media objects. This access information is further enhanced through additional metadata annotations made by users through Zeega (e.g. geolocation, custom tags, description). Zeega never copies or hosts any media files, and in every instance it displays proper citation and trackback URLs, thereby ensuring that projects produced using Zeega do not infringe on copyright. Front-end applications built on top of this foundation can display a database's assets through different modes of visualization and navigation. This concept was originally developed and demonstrated publicly as part of *Mapping Main Street* (<http://mappingmainstreet.org>), a collaboration between the Berkman Center, NPR and the Corporation for Public Broadcasting. Mapping Main Street is an ongoing collaborative documentary media project that creates a new map of America by pulling stories, photos, and videos recorded on actual Main Streets from the NPR, Flickr and Vimeo APIs. Zeega has recently been prototyped at Harvard as part of Media Archaeology of Place (<http://mediaarchaeologyofplace.org>), a PITF and Sensory Ethnography Lab project in which students use an HTML5 interface to geolocate and add individual media objects to a collaborative database and create nonlinear digital narratives that combine this media with their own audio, video and text.

Zeega's capabilities will not only be expanded and refined, but also extended through the creation of Sirikata-based resources. Developed at the Stanford Humanities Lab and KataLabs, Sirikata is a BSD licensed open source platform for browser-based 3d that provides a set of libraries and protocols that can be used to deploy games and virtual worlds, as well as fully featured implementations of services for hosting and deploying games and worlds. Sirikata relies upon the now widely adopted WebGL standard (present in the current beta releases of Firefox, Safari, and Chromium) which provides a programmatic interface for 3d graphics using the HTML5 canvas element. Browser-based 3d opens up some exciting new prospects not only for organizing access to and animating 2d archives but also for integrating work with objects and object-based collections into new forms of teaching and collaborative scholarship.

We propose building on this foundation, and developing this new infrastructure through a series of focused implementations connected to user groups and collections inside and outside the University. This context-based approach will ensure a hands-on testing and feedback environment, as well as foster adoption for long-term impact. Throughout, the intent will be to meet specific project requirements while producing generalized, reproducible solutions.

Showcase Project - Thick Mapping the American Landscape

We propose the creation of a showcase project that will illustrate the transformative potential of the proposal's larger concept of API-driven multimedia exhibition and re-interpretation. Using Loeb Design Library's "American Landscape and Architectural Design 1850-1920" collection of digitized magic lantern slides as a starting point, this project would cut across the different core feature objectives and user groups, drawing Harvard's libraries into a programmable web with the Library of Congress, Flickr, YouTube, and other online media repositories. We define this approach as *thick* mapping, adapting Clifford Geertz's concept of "thick description" to an innovative mode of researching, representing,

annotating and narrativizing landscapes through the structured interplay of multiple layers of media, drawn from multiple sources and time periods.

Digitized through the American Memory Project and entirely available under fair use, this collection of approximately 2,800 lantern slides represents an historical view of American buildings and landscapes built during the period 1850-1920. Although the documentation of canonical architectural design played a vital role in this collection, the lantern slides also illustrate a variety of socioeconomic environments. The collection records environments of lower and middle class Americans along with the estates and mansions of wealthy members of society. Because of this, the collection can also be seen as a social document, as well as an architectural survey.

Currently, these images are accessible on the Library of Congress website and through VIA. In both cases, however, it is difficult to experience the breadth or depth of the collection, not to mention to perceive interrelationships with other media objects within and outside the repository. Both are “flat” archives, organized as if a vast filing cabinet to be experienced by reaching into one or another folder.

Through the Library Lab, we propose geolocating the media within this collection, and creating an online research, teaching, and curation environment that combines these images with relevant streams of media from other repositories and APIs. We are particularly interested in combining this collection with other geographically-specific collections of audio, video and images inside and outside the University. From within Harvard, we plan to incorporate ca. 1500 landscape images documenting the Arnold Arboretum, along with the Arboretum’s collection of aerial images. It also likely that new, relevant digital collections will become available at Schlesinger Library, Harvard Film Archive and Loeb Music Library, after speaking with archivists Melissa Dollman, Liz Coffey and David Ackerman, respectively. Some of the most promising external digital collections we have identified are (see Appendix A for a full list):

- [Boston Public Library’s Flickr stream](#), including collections of photographs from the 1873 fire, stereoscopes and regional postcards.
- [The Macaulay Library at the Cornell Lab of Ornithology](#), the world’s largest natural sound and video archive of animal behavior, all freely available and already geolocated.
- Over 3,000 sound recordings already digitized and available as .mp3 and .wav as part of the [Library of Congress’ American Memory Project](#), ranging from early Edison film and sound recordings to presidential speeches to music and oral histories collected in California, Ohio, West Virginia, the Dust Bowl and the South.
- [The Library of Congress’ YouTube channel](#), which includes a collection of 26 films from San Francisco recorded 1897-1916, amongst hundreds of other historical videos.
- [The Urban Landscape Digital Image Access Project at Duke University](#), containing thousands of images of urban landscapes from 14 institutions across the country.

We would design and build three innovative interface templates for working with and exhibiting digital multimedia collections. Integrated into each view would be search and dynamically-generated navigation to related media assets. These forms of “incidental discovery” (similar to what happens when browsing books in the stacks) would be generated through custom algorithms developed using a combination of a media object’s metadata and user behavior. In the future, it might be possible to incorporate recommendations for HOLLIS records that are related to individual audiovisual media objects. The three interfaces we would develop for this showcase project are:

1. Map

This view would display a collection using a map-based interface.

2. Grid

This view would display a collection through multiple image thumbnails, with the ability to easily curate and display a slideshow.

3. Slide Drawers

This view would set out to capture key aspects of the physicality of the medium being examined—in this case black and white, glass magic lantern slides—that are otherwise stripped away by digitization; (thickness, size, binding, surface, labeling conventions; the history of the medium itself, its use, and the support devices and techniques [projectors, screens, special effects]).

All three will be developed in both 2d and 3d iterations with the 3d serving as the default mode for clients that are running WebGL-enabled browsers. We are persuaded that 3d interfaces offer fundamental cognitive and navigational advantages with respect to conventional interface designs when dealing with large and/or non-text-based archives (viz. sound recordings), not to mention in visualizing complex webs of connection between different kinds of media artifacts. In each and every case, they allow for variable, user-controlled viewing angles on the same core sets of media assets, as well as for multiple views (grid, map, etc.).

In addition to aggregating these different collections and providing new forms of visualization and navigation, we propose facilitating a national remix initiative to encourage people to help further annotate these collections and create new combinations of this archival media, along with incorporating their own material. A variety of Harvard courses would contribute to the initiative, but to generate widespread participation, this initiative would be presented with multiple media and outreach partners. *Places Journal*, a leading online journal of contemporary architecture, landscape, and urbanism with over 175,000 unique visitors per month, is committed to publishing a series of articles on specific lantern slides in juxtaposition with other media. *Sensate*, a new Harvard-based online journal for innovative projects that engage new modes of media-based scholarship and critical practice has agreed to create a dedicated issue on the topic of thick mapping and the American landscape. We will also explore media partnerships with local NPR stations (e.g. WGBH) and possibly a national broadcast radio series.

Pedagogical Development Environments

In addition to the showcase project, these tools will also be developed through the following Harvard courses during the course of the grant. Working with these classes will inform future content and software development needs.

Spring 2011

HISTSCI 290 | GSD 3497: Critical History: Curating Images, Objects, Media
Professors Peter Galison and Jeffrey Schnapp

Online exhibition showing the process of creating installations of four distinct objects in the Harvard library collections.

VES 158ar | ANTH 2835r: Sensory Ethnography / Image, Sound, Culture: Studio Course
Professors Lucien Castaing-Taylor and Ernst Karel

Media anthropology students will record sounds at the contemporary locations of Boston-based images held in the Harvard Libraries, and then combine these into an online multimedia map.

HAA 208g | GSD 3435: The Architectural Imagination (Graduate Seminar in General Education)
Professors K. Michael Hays and Erika Naginski

This course is aimed at developing a curriculum for a new proposed undergraduate concentration in architecture. An ongoing discussion of how best to use these digital tools in the concentration's course offerings will be integrated into the workshop sessions.

GSD 3448: The Mixed-Reality City
Professor Jesse Shapins

Students will use these tools to create a series of mobile-phone based performance walks in the Boston metro region combining archival media from each location with contemporary recordings.

Fall 2011

Gen Ed - United States in the World 24: Reinventing Boston: The Changing American City
Professor Chris Winship

Students will use the tools to fulfill the assignment of creating 5 neighborhood memos, combining their own photos, audio and video with archival media.

Gen Ed - Aesthetic and Interpretive Understanding: The Architectural Imagination
Professor K. Michael Hays

The professor plans to use these tools to build web-based multimedia lectures, incorporating archival images from Harvard libraries with other repositories (e.g. Flickr). Moreover, students will use these tools to fulfill assignments, creating multimedia essays that integrate images from the Harvard libraries.

Technical Requirements

Opening up VIA

Ability to access VIA digital image URLs and metadata in order to use them for novel forms of in-class presentation and public exhibition. We have spoken with Randy Stern and Bobbi Fox, developers of the VIA backend, and they already have an experimental API. Through this Library Lab proposal, this VIA API would be further developed, useful for both this specific project, as well as others.

Giving back to VIA and the Open Data Community

We would create an API for Zeega that pushes data generated through Zeega implementations back into the Harvard libraries. The first test for this would be the geolocation of the lantern slide collection. Moreover, this API would enable future app development inside and outside Harvard. Through this Library Lab proposal, a new VIA API would be added to support input of geolocation information for images from Zeega back into a VIA record, and further back into the original catalog record for the image, either in OLIVIA or in Shared Shelf for subsequent re-use.

Curatorial Interfaces for Creating Multimedia Exhibitions

We would develop curatorial tools and VIA APIs that allow users to generate collections based on search strings (e.g. all images in VIA and Flickr with the keywords "boston"), and then to filter these collections for public exhibition. These collections could be generated through a combination of different APIs, thus facilitating the easy creation of collections that cross institutional and medium-specific boundaries.

Mobile and Tablet Browsing

As the whole project will be built using HTML5, we will also provide mobile and tablet-formatted versions of any exhibition created.

Remixing Archival Media

In addition to providing tools to generate large databases and visualize collections, these tools will also enable users to combine different individual assets from multiple collections into authored, narrative sequences.

Multiple Users Editing a Single Sequence

Similar to Google Docs, we will allow multiple users to collaboratively edit a single project. The multiplayer capabilities of Sirikata will allow for real-time collaborative work in 3d environments as well as on 3d objects and collections.

Sharing

Embed feature and tie-ins to Twitter, Facebook, etc.

Dynamic Content

We would provide the ability to layer dynamic content into any collection or narrative sequence. This is crucial for the participatory portion of the showcase project as it allows anyone to contribute media to Flickr, YouTube and SoundCloud and have these contributions automatically incorporated into the project.

User-Friendly New Project Creation and General Project Documentation

Currently, in order to produce new projects using Zeega, manual installation on a remote server is required.

Through the Library Lab, we would make it possible for any user to create a unique, hosted instance of Zeega through an easy-to-use online interface. This experience would be as simple and easy as creating a new blog on WordPress.com. Through this, library and public users of all kinds could create multimedia slideshows and online exhibitions combining Harvard-owned digital assets with other media from across the web.

In addition to this hosted, non-technical solution, we would also create a thoroughly documented open-source version of the codebase for more custom installations and further development. This is equivalent to what is offered on WordPress.org.

Timeline and Phasing

The project would take one year to complete and would be developed in two distinct phases.

Funding Stage 1

During the first phase (spring 2011), we would develop a proof of concept for the showcase project focused on the Boston metro region. This version would include a preliminary integration of VIA, Zeega and Boston maps from the Center for Geographic Analysis, with some initial testing of Sirikata integration. It would be available online, as well as on mobile and tablet devices. In addition to this prototype, during the first phase we would also: a) develop the graphic design mock-ups and technical requirements for the interface templates required for working with and exhibiting digital multimedia collections; b) make use of the term's pedagogical environments (HISTSCI 290, VES 158ar, HAA 208g and GSD 3448) to carry out user testing with both faculty and students.

Funding Stage 2

During this phase, we would expand the Boston-based prototype to the national scale, incorporating all of the images from the Lantern Slide collection, as well as adding additional collections from the Library of Congress, the Prelinger Archives, Flickr, YouTube and other repositories. In addition to the project development and full Sirikata integration, we would perform extensive outreach to libraries and local history associations across the country, in collaboration with *Places* and other media organizations, to facilitate the participatory annotation and media production portion of the project. In addition to the showcase project, in the second phase, the software would be used in pedagogically for lectures and classrooms in two Gen Ed courses. This phase would culminate in the release of a hosted and open-source version of the software (w/ documentation), marked by a major public event in fall 2011.

Resources

We recognize this proposal might be unique to the Library Lab's production structure, as our team includes experienced designers, developers, project managers and producers, who are both within Harvard and outside consultants. In addition to this team, we would imagine needing additional personnel that could either come from inside or outside the University. We imagine the institutional home for the project to be the Berkman Center and GSD.

- 2 full-time advanced JavaScript developers (12 months)
- 1 part-time graphic designer (12 months)
- 1 part-time project manager (12 months)

1 part-time Sirikata programmer (12 months)
1 part-time producer for “Thick Mapping the American Landscape” project (12 months)
Systems Administration consultant (3 months)
Work-study positions for GSD students for geolocation assistance (3 months)
Backfill time for VIA programmers
Web Hosting

Beta testing/idea-generation workshops (hackathons)

- Students in critical media practice
- GSD faculty
- “Thinking w/ Technology” community
- Berkman Fellows
- Boston metro community of digital multimedia librarians

Fall launch event

Evaluation

Short-term benefits will be primarily measured based on the degree to which the platform is adopted in teaching and research efforts across the University. If we successfully deploy the platform in the above-mentioned teaching environments, students and faculty in multiple schools, undergraduate and graduate, will be exposed to the tools and the potential for a new mode of engaging with digital multimedia collections. We will consult with faculty, students and staff to hear what worked and what needs improvement to better meet their needs at mid-term and the end of the semester (by means of interviews and a questionnaire). Beyond simple implementation, the ultimate success of these efforts will be measured by interest from other faculty, students, staff and outside institutions in using the platform.

The success of the first phase of the showcase project will be evaluated based on the ability to make multiple collections related to the Boston metro region accessible through an easy-to-use interface and demonstrating meaningful interrelationships between previously atomized media objects. The success of the full-scale showcase project will be based on the number of interesting collections we are able to meaningfully aggregate and make accessible for reinterpretation. As a primary aim of the showcase project is to generate awareness of the platform within the University and beyond, publicity, site traffic and average time of visit will be key metrics. We will also measure the success for this portion of the project by the number of users, and the quality of annotations and contributions they make.

Long Term Sustainability

Long-term, this project proposes a uniquely lightweight means of supporting the Harvard libraries. Based on independent open-source initiatives, the further development of the software is not the sole responsibility of the University. Instead, as is well-known, successful open-source projects produce benefits through distributed contribution, so as the project grows through a community beyond Harvard, the value for Harvard libraries increases.

We believe this project is uniquely situated to achieve this aim because of our diverse team that sustains connections across multiple Schools within Harvard, enabling strong adoption and investment from many departments and offices over time; to a wide network of librarians focused upon digital multimedia; to the broader open-source development community through the Berkman Center; to the journalism and new media publishing sector through our long-time work in the field and relationships to PRX and the Nieman Lab; and to the new media art and design community.

We would be happy to meet with the Library Lab Proposal Review Committee to discuss our proposal and answer questions. During a meeting, we could present the working prototype of Zeega to give you a further sense of the software current capabilities and long-term potential. Please do not hesitate to contact us.

Jeffrey T. Schnapp (jschnapp@gsd.harvard.edu)

Jesse Shapins (jshapins@fas.harvard.edu)

Ann Whiteside (awhiteside@gsd.harvard.edu)

Appendix A: Preliminary Survey of Additional Digital Collections of Interest

Audio

Environment, natural life:

American Field Guide

<http://www.pbs.org/americanfieldguide/>

<http://macaulaylibrary.org/index.do>

<http://blb.biosci.ohio-state.edu/>

Music, oral:

Vincent Voice Library at Michigan State University Libraries

<http://vvl.lib.msu.edu/index.cfm?action=formattype>

Direct URL access to 2063 .mp3 files

The Vincent Voice Library is a collection of primary source sound material, found mainly in speech, interview, lecture and performance formats. It is the largest academic voice library in the United States and is part of the Michigan State University Libraries. Most items held in the public domain are available for online listening as mp3 files.

Collections highlights include:

- Rare Edison recordings from the late Nineteenth Century and early Twentieth Century, including the voices of Sarah Bernhard, Buffalo Bill Cody, Gladstone, Tennyson, and Queen Victoria.
- Voices of the American Presidents since Benjamin Harrison, including speeches, interviews and press conferences.
- A large holding of World War II actualities, featuring Nazi propaganda, war news from the major networks, and the speeches of Churchill, Stalin and FDR.
- A broad representation of the arts in America and abroad, with the voices of Barrymore, Picasso, John Lennon, Brando, Fanny Brice, Bob Hope, Louis Armstrong, George Bernard Shaw, Salvadore Dali, T.S. Eliot and others.
- A view of the life and culture of Michigan State University, including speeches of the University Presidents and such visitors to campus as Martin Luther King, Jr., Malcolm X, Timothy Leary, Allen Ginsberg and Bill Clinton.

Cylinder Preservation and Digitization Project at University of California Santa Barbara

<http://cylinders.library.ucsb.edu/browse.php>

Direct URL access to thousands of .mp3s

-Topics vary from prohibition to transportation to music and oral histories divided by state.

Belfer Audio Laboratory Cylinders Digital Connection and Archive at Syracuse University

<http://libwww.syr.edu/information/belfer/cylinders/index.html>

Direct URL access to 1200 .mp3 and .wav files (they are planning to have 6,000 available by the end of 2010)

Collections range from chicken sounds to tango music to vaudeville to yoddles to presidential speeches.

Video

Work, culture:

<http://memory.loc.gov/ammem/awlhtml/> ;

Images

Built environment:

<http://library.duke.edu/digitalcollections/diap/>

Scientific:

<http://www.photolib.noaa.gov/>

Historic:

Tending the Commons: Folklife and Landscape in Southern West Virginia

<http://library.pacific.edu/ha/digital/spooner/spooner.asp>

Library of Congress collection includes 679 excerpts from original sound recordings and 1,256 photographs from the American Folklife Center's Coal River Folklife Project (1992-99) documenting traditional uses of the mountains in Southern West Virginia's Big Coal River Valley.

Quaker friends meeting houses

http://tritych.brynmawr.edu/cdm4/browse.php?CISOROOT=/SC_Houses&CISOSTART=1,141

All images tagged to cities

The Asahel Curtis Photo Company Photographs

<http://content.lib.washington.edu/cdm4/browse.php?CISOROOT=/curtis>

Collection of 1,677 items provides one of the most valuable photographic records of Seattle, Washington State, Alaska and the Klondike covering a period from the 1850s until 1940. This Photo Company was the last in a series of photo studios associated with Asahel Curtis. The studio did primarily commercial work and specialized in documenting Pacific Northwest activities.