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ASSESSING IMPACT OF MEDIUM-SIZED INSTITUTION DIGITAL CULTURAL HERITAGE ON WIKIMEDIA PROJECTS

Efforts by cultural heritage institutions to increase awareness of their digital collections have led them to find creative ways to reach users. One method for increasing access to digital special collection, archive, and museum holdings that has seen increasing popularity is the addition of digital cultural heritage materials and links to Wikimedia projects including Wikimedia Commons and Wikipedia. However, existing literature detailing the process and results of such strategies centers primarily on the work of large research institutions and focuses on web analytics to show the success of these projects. It is unclear if smaller institutions with niche and focused collections will see the massively increased traffic to their websites and digital libraries many of these programs have reported. There is also little evaluation of other means of impact for cultural heritage institutions linking their holdings to Wikimedia products, such as reuse of images or information published to Wikimedia by cultural heritage institutions. In order to contribute to the knowledge gap in this area of research, this article details a case study in linking and uploading digital assets from a medium-sized liberal arts college to Wikimedia projects, and assesses impact via web traffic, wiki reuse, and image reuse. The details of this research provide standards and methods for smaller institutions to model for similarly scaled projects while raising questions about the efficacy of undertaking such projects, particularly in light of the labor required, and about the need for better tools to differentiate between human and machine reuse.

Brief Overview of Wikimedia Projects

The Wikimedia Foundation is a nonprofit organization dedicated to free, public, open-content projects and was created in order to fund the online open encyclopedia Wikipedia. Since its inception, the Wikimedia Foundation has grown to encompass nearly a dozen discreet “content projects” as well as “infrastructure and coordination projects,” all available freely, publicly, and for editing by the public.¹ Content projects of the foundation include

- Wikipedia, an encyclopedia published in hundreds of languages. Wiki editors, or Wikipedians, can create new entries in Wikipedia, edit text and structured data for articles, and add media to articles from . . .
- Wikimedia Commons, a repository of images, sound recordings, videos, and other media for use on other Wikimedia Foundation projects, such as in Wikipedia articles, as well as for reuse beyond the Wikimedia platform. Wikipedians can upload media, create galleries, nominate and vote for featured or quality images, and monitor the use of media on other Wikimedia projects, such as in Wikipedia articles or on . . .
- Wikidata, a structured data database that acts as central storage for Wikipedia, Wikimedia Commons, other Wikimedia Foundation projects, and projects outside of Wikimedia, and contains items that represent topics, concepts, and objects.

Literature Review

¹ “Wikimedia Foundation.”

Cultural heritage institutions with digital resources, ranging from digitized collections to online finding aids, have shifted their priorities from restricting collections access to expanded openness and “broadest use” as a result of growing Web 2.0, or social web, technologies.² One strategy for increasing access to digital cultural heritage resources is the addition of links or uploaded media to the Wikimedia environment. Outside of the cultural heritage sector, adding public domain and open-licensed images to Wikimedia Commons, the media repository for all Wikimedia products, has been promoted as an effective search engine optimization strategy for marketers.³ This is supported by a 2012 study in the United Kingdom which found that over half of noun searches in Google pointed to a Wikipedia page as the first result, and that 99 percent of these searches included a Wikipedia entry on the first page of results.⁴ For cultural heritage institutions reaching beyond the goal of simply raising awareness of collections through social media channels, Wikimedia projects provide the opportunity to embed primary resources and references directly in an existing research environment.

Cultural heritage institutions have been experimenting with promoting their collections through Wikimedia projects for over a decade now, sometimes with extraordinary results. One of the earliest instances is a 2007 University of Washington Libraries project in which the Digital Initiatives unit worked with students to add digital collections links to Wikipedia, resulting in an upward trend in referrals from Wikipedia to the institution’s digital collections.⁵ Since then, library, archive, and museum wiki initiatives at the University of North Texas, University of Las Vegas Nevada, Wake Forest University, Syracuse University, National Archives, University of Houston, Ball State University, University of Pittsburgh, and Texas Tech University have seen immense increases in digital library and website traffic, referrals, downloads, and even in-person reference requests as a result.⁶ University libraries and archives have also involved students in editing wiki projects. Graduate students at Villanova University authored new Wikipedia articles and linked those as well as existing articles to digital collections of personal papers.⁷ An intern for Calisphere, part of the California Digital Library, added digital collection links to Wikipedia and found existing links and Wikimedia Commons uploads from Calisphere, providing a glimpse into which resources Calisphere users find most useful.⁸ And Ohio University introduced their special collections to composition students with the goal of students authoring or editing Wikipedia articles related to the university’s collections.⁹

More recent examples include an attempt to determine the overall impact of digital items from the Imperial War Museum Collections on Wikimedia Commons, finding that images were much more

² Cooban, “Should Archivists Edit Wikipedia.”

³ Broer, “An Untapped SEO Opportunity.”

⁴ Silverwood Cope, “Wikipedia.”

⁵ Lally and Dunford, “Using Wikipedia to Extend Digital Collections.”

⁶ Belden, “Harnessing Social Networks to Connect with Audiences”; Del Bosque et al., “Discovering Places to Serve Patrons in the Long Tail”; Pressley and McCallum, “Putting the Library in Wikipedia”; Combs, “Wikipedia as an Access Point for Manuscript Collections”; Ferriero, “On the Growing Relationship between the National Archives and Wikipedia”; Elder, Westbrook, and Reilly, “Wikipedia Lover, Not a Hater”; Szajewski, “Using Wikipedia to Enhance the Visibility of Digitized Archival Assets”; Galloway and DellaCorte, “Increasing the Discoverability of Digital Collections Using Wikipedia”; Perrin et al., “Know Your Crowd.”

⁷ Incrovato, “The Digital Library @ Villanova University and Wikipedia.”

⁸ Zentall and Cloutier, “The Calisphere Wikipedia Project.”

⁹ Vetter and Harrington, “Integrating Special Collections into the Composition Classroom.”

likely to be viewed on Wikipedia articles than directly in Wikimedia Commons.¹⁰ The Wicipobl project from the National Library of Wales used Europeana’s Impact Playbook to plan and then assess the impact of 4,862 Welsh portraits uploaded to Wikimedia Commons and corresponding metadata contributed to Wikidata.¹¹ And after a comparison of web analytics for images on the Smithsonian website and on Wikipedia showed one thousand times more views on Wikipedia, the museum implemented efforts to increase the Smithsonian’s presence on Wikipedia through edit-a-thons and contributing or enhancing data on Wikidata.¹² The Wikipedia project page on the GLAM-Wiki Initiative (“galleries, libraries, archives, and museums” with Wikipedia) further details successful collaborations between cultural heritage institutions and Wikipedians.¹³

The proliferation of these projects shows an increasing interest by cultural heritage institutions in working directly with wiki projects to promote collections and enhance knowledge of archival resources. As Archivist of the United States David Ferriero pointed out as far back as 2011, “Our work with Wikipedia is not only good enough, it’s great for us because it takes our goals of transparency, public participation, and collaboration to a new level.”¹⁴

Over a decade has passed since the first documented attempt by a cultural heritage institution to link their collections to wiki projects, so it is now possible to begin to isolate trends and best practices in these efforts. First, the majority of documented cases have involved large research universities or international museums, many of whom have world-renowned digital collections with a wide appeal. While some of the studies discussed here detail specific collections linked via Wikipedia, most do not, so it is not clear what types of digital collections or items would most likely result in the large increases in web traffic often reported. Successful attempts to link wiki projects to digital assets have ranged from single item uploads to hundreds or even thousands of wiki edits made by cultural heritage employees. In addition, cultural heritage institutions that have undertaken wiki projects have typically measured success of such efforts by looking at web analytics to their institutional websites and digital collections, though some also look at reuse on other wiki projects as well as reference requests.

Despite the overwhelming success reported in these projects, there may be barriers or drawbacks to engaging in such work. As Joy M. Perrin and colleagues note, cultural heritage institution embellishment of Wikipedia or Wikimedia Commons is a labor-intensive pursuit that may not be feasible for large-scale projects.¹⁵ Several of the cases outlined here also report difficulty in cultural heritage professionals and student workers learning the intricacies of Wikipedia editing, and some ran into significant hurdles in getting their links added without immediate deletion by other Wikipedians.¹⁶ Reports of such experiences are primarily found in the earliest articles detailing such projects, and updates to Wikipedia’s policies on “conflicts of interest” as well as

¹⁰ Morley, “Use and Impact of Cultural Heritage Images.”

¹¹ Jason.nlw, “English”; “Measuring Impact for the Cultural Heritage Sector.”

¹² Kapsalis, “Wikidata.”

¹³ “Wikipedia:GLAM/About.”

¹⁴ Ferriero, “On the Growing Relationship between the National Archives and Wikipedia.”

¹⁵ Perrin et al., “Know Your Crowd.”

¹⁶ Lally and Dunford, “Using Wikipedia to Extend Digital Collections”; Pressley and McCallum, “Putting the Library in Wikipedia”; Zentall and Cloutier, “The Calisphere Wikipedia Project.”

dedicated efforts to link experienced Wikipedians with cultural heritage institutions may have diminished some of these concerns.¹⁷

Additional criticisms of Wikipedia include concerns involving gross gender imbalances among content and editors, animosity toward women editors, and a lack of coverage of people of color due to the overwhelming whiteness of its editorial community.¹⁸ Some attempts to solve these issues have arisen by way of edit-a-thons, in which groups of new and seasoned Wikipedia editors converge and attempt to improve the site's coverage of underrepresented groups, such as Afrocrowd, and to empower "gendered activism," such as the annual art+feminism wiki edit-a-thon events.¹⁹ However, these obstacles will undoubtedly affect cultural heritage institutions where employees are predominantly women, thus risking hostility from other Wikipedia editors and the potential for unwarranted rejection of edits or uploads, and where employees, and librarians in particular, are predominantly white, risking the perpetuation of inherent racial biases already identified as hindrances to the overall value of wiki projects.²⁰

A recent study by George Cooban provides some best practices and strategies for cultural heritage institutions planning on working with wiki projects. Interviews with Wikipedians-in-residence and cultural heritage professionals were conducted to determine how archivists could best work with Wikipedia. The Wikipedians-in-residence advocated for archivists to improve articles beyond just adding links to collections in the "External Links" sections of articles, noting that "although adding links back to their catalogues can be worthwhile for both archivists and Wikipedia, editing articles, uploading content to Wikimedia Commons or investigating Wikidata may be more valuable still."²¹ In keeping with the "Wikimedia Movement Strategic Direction" to think of "knowledge as service," the GLAM-Wiki community has increasingly interacted with wiki products by sharing structured data through Wikidata. The benefits of doing so include utilizing concepts from Wikidata to enhance catalog directions, increasing awareness of cultural heritage collections by contributing data to Wikidata, and utilizing the tools and features of Wikidata and other wiki products to further create tools, software, and visualizations that extend the functionality of traditional library cataloging and indexing systems.²² The Library of Congress has begun taking advantage of these tools and features, adding Wikidata identifications for name authority file and Library of Congress subject headings to id.loc.gov, the linked data repository for Library of Congress authority files, and subsequently building an interface combining Library of Congress collection items with Wikidata information.²³ Cultural heritage contributions to Wikidata have also enabled institutions to evaluate gender and race imbalances and coverage gaps in both wikis and library authority records.²⁴

¹⁷ Wittylama, "Conflict of Interest and Archives."

¹⁸ Boboltz, "Editors Are Trying to Fix Wikipedia's Gender and Racial Bias Problem"; Hesse, "History Has a Massive Gender Bias"; Paling, "Wikipedia's Hostility to Women"; Wagner et al., "It's a Man's Wikipedia?"

¹⁹ "Afrocrowd.org"; Evans, Mabey, and Mandiberg, "Editing for Equality"; Robichaud, "Wikipedia Edit-a-Thons"; Stinson, Fauconnier, and Wyatt, "Stepping beyond Libraries."

²⁰ For more in-depth critiques of whiteness in librarianship, see Bourg, "The Unbearable Whiteness of Librarianship"; Chou and Pho, *Pushing the Margins*; Espinal, Sutherland, and Roh, "A Holistic Approach for Inclusive Librarianship"; Hathcock, "White Librarianship in Blackface"; Ramirez, "Being Assumed Not to Be"; and Strand, "Disrupting Whiteness in Libraries and Librarianship."

²¹ Cooban, "Should Archivists Edit Wikipedia," 267.

²² Stinson, Fauconnier, and Wyatt, "Stepping beyond Libraries."

²³ Ferriter, "Integrating Wikidata at the Library of Congress."

²⁴ Kapsalis, "Wikidata"; Klein and Kyrios, "VIAFbot and the Integration of Library Data on Wikipedia."

Cooban notes that cultural heritage professionals should see engaging with wiki projects less as a “tool” for promoting their collections and more as a “quid pro quo” relationship in which the wiki edits are of equal benefit to the institution as to Wikimedia project users. Cooban also reports that qualitative analysis of cultural heritage engagement with wiki projects is lacking and that most institutions focus on web traffic as a measure of success. Another method for assessing the impact of digital cultural heritage is content reuse and, in particular, image reuse. Reverse image lookup (RIL) services like Google Image Search or TinEye can be used by uploading an image or inputting an originating URL to find duplicates and similar images online. Previous RIL research have located instances of image reuse and then analyzed the context and purpose of reuse to help make digitization, marketing, and staffing decisions at cultural heritage institutions with collections ranging from the natural sciences to national library and gallery collections.²⁵

Research Methodology

In order to add diversity of institution type to the existing literature regarding cultural heritage institutions and wiki projects, as well as to propose additional impact measures for conducting such work, the following study details a project undertaken at Loyola University New Orleans (LUNO) to enhance Wikimedia Commons and related Wikipedia articles by adding digital assets.

Loyola University New Orleans

Unlike the previous cultural heritage institutions detailed, LUNO is a medium-sized private, liberal arts college with a Master’s L Carnegie Classification. LUNO’s special collections and archives preserves materials related to the history of Louisiana and the South, the Society of Jesus (Jesuits), and LUNO itself, and includes manuscript collections, rare books, microfilm, and digital collections. Digital collections are ingested as part of the Louisiana Digital Library, a statewide consortia that uses Islandora as its platform.²⁶

Users, Use, and Reuse

This study accepts the working definitions of “use” and “reuse” adopted by the Institute of Museum and Library Services national leadership grant project “Developing a Framework for Measuring Reuse of Digital Objects.” “Use” is defined as “discovering and browsing objects in a digital repository, often described as ‘clicks’ or ‘downloads’ without knowing the specific context for the use,” while “reuse” is defined as “how often and in what ways digital repository materials are utilized and repurposed. In this definition, we do know the context of the use.”²⁷ Users are generally assumed (or, at the very least, hoped) to be human users and not bots or web crawlers, though, as is discussed later, the choice to analyze use and reuse by machine-generated “users” may vary by institution.

²⁵ Kelly, “Reverse Image Lookup of a Small Academic Library Digital Collection”; Kirton and Terras, “Where Do Images of Art Go Once They Go Online?”; Kousha, Thelwall, and Rezaie, “Can the Impact of Scholarly Images Be Assessed Online?”; Reilly and Thompson, “Understanding Ultimate Use Data and Its Implication for Digital Library Management”; Reilly and Thompson, “Reverse Image Lookup.”

²⁶ Louisiana Digital Library, <https://www.louisianadigitallibrary.org>.

²⁷ Kelly et al., “Setting a Foundation for Assessing Content Reuse.”

Wikipedia and Wikimedia Commons Edits

Several different strategies were undertaken in order to compare and contrast their efficiency and impact in this case study. Following tips and best practices identified in the literature review case studies, the author created a wiki editor account to keep track of edits and uploads. As others have noted, however, if additional LUNO staff or students begin working with Wikipedia and Wikimedia Commons in the future, additional accounts will need to be created and “watchlists” can be developed to monitor activity related to LUNO edits.

First, ninety-eight images from three distinct collections were uploaded to Wikimedia Commons. These were

- Forty-nine images from Johann Gottlieb Mann’s *Deutschlands wildwachsende Arzneypflanzen*, a volume published in 1828 containing hand-colored lithographs of medical plants, flowers, and fruits, digitized and available in the Louisiana Digital Library;²⁸
- Forty-six images from the LUNO University Photographs Collection, comprising photographs dating back to the early twentieth century from the University Archives, digitized and available in the Louisiana Digital Library;²⁹ and
- Three images of Janet Mary Riley, a LUNO alumna and the first female law professor in New Orleans, digitized and available in an Omeka digital exhibit.³⁰

All of the images were determined to be in the public domain and were chosen for the diversity in audience they might attract. *Deutschlands wildwachsende Arzneypflanzen* is rare; WorldCat reports that twenty libraries own it. It has the potential to appeal to visual artists, scientists, botanists, and Germanic studies scholars, to name a few. The LUNO University Photographs Collection may have a much smaller potential audience composed of LUNO alumni and New Orleans history enthusiasts, but the objects are largely unique and reuse of them could easily be traced back to institutional holdings if applicable. The Janet Mary Riley images are also relatively unique and were chosen as a completed article on her was not yet available in Wikipedia, and also to contribute to women’s history on Wikipedia. It should be noted, however, that like many American universities, the collective memory of LUNO documented in the archives largely reflects a white male view of campus, as well as a larger white male representation of history via LUNO’s rare books, and the images selected for inclusion in this case study reflect such biases, power, privilege, and oppression. Future additions from LUNO’s collections should attempt to increase the representation of nonwhite, nonmale perspectives from both the archives and the rare book collection.³¹

²⁸ “Germany’s Wild Medicinal Plants,” Louisiana Digital Library, <https://www.louisianadigitallibrary.org/islandora/object/loyno-p16313coll20:collection>.

²⁹ “Loyola University New Orleans University Photograph Collection,” Louisiana Digital Library, <https://www.louisianadigitallibrary.org/islandora/object/loyno-p16313coll28:collection>.

³⁰ “Janet Mary Riley: A Voice for Social Justice in Louisiana,” Loyola University New Orleans Special Collections and Archives, <https://loynosca.omeka.net/exhibits/show/jmr>.

³¹ For a more in-depth analysis of how university student publications reinforce the entitlement of whiteness as the dominant experience in colleges, see Stewart, “Whiteness as Collective Memory in Student Publications at Midwestern Liberal Arts Colleges.”

The images were uploaded to Wikimedia Commons using the UploadWizard, and metadata was entered manually based on existing metadata in the digital library and exhibit.³² Links to the Louisiana Digital Library collection or Omeka exhibit for each corresponding digital object uploaded to Wikimedia Commons were included in the Wikimedia Commons metadata.

Prior to uploading to Wikimedia Commons, the Google Image “Search by Image” function was used to find instances of reuse for these same images.³³ The content or purpose of the website where reuse was identified was labeled using content analysis, a quantitative research method.³⁴

Next, seven existing Wikipedia articles were edited to include links to six LUNO digital collections, four individual digital objects, the Janet Mary Riley exhibit, and a digital timeline using archival materials hosted on LUNO’s website. In addition, an existing Riley draft article was completed, and a new article was authored about Joseph-Aurélien Cornet. In sum, the digital collections, objects, exhibits, and timeline linked on Wikipedia included

- Joseph-Aurélien Cornet, FSC, Collection
- Johann Gottlieb Mann, *Deutschlands wildwachsende Arzney-Pflanzen*
- Janet Mary Riley: A Voice for Social Justice in Louisiana (exhibit)
- Lafcadio Hearn Correspondence Collection
- Loyola University Athletics Collection
- Loyola University *Maroon* Newspaper Collection
- Loyola University Photographs Collection
- New Orleans Opera Association Archives Collection
- New Orleans Opera Association Timeline
- New Orleans Review Collection
- Crescent City Jockey Club Program, March 1 1904
- Crescent City Jockey Club Program, January 3 1906
- Henry Mayer, *In Laughland*.
- S. Augustus Mitchell, *Mitchell’s Ancient Atlas, Classical and Sacred*³⁵

Abbreviated titles for each collection and item are listed in appendix A.

Following best practices, Wikipedia page edits included adding links to these collections and items in the External Links sections of Wikipedia pages, adding links in the bodies of articles, and adding relevant information to the bodies of articles using digital collection descriptions and finding aids, thus resulting in additional links added to the References sections of articles.

All editing and uploading was completed from July 16–18, 2018. A single librarian who was familiar with the collections (and who had been primarily responsible for initial metadata creation

³² https://commons.wikimedia.org/wiki/Commons:Upload_Wizard.

³³ “Find Related Images with Reverse Image Search.”

³⁴ Drisko and Maschi, *Content Analysis*.

³⁵ All collections and items can be found in the Louisiana Digital Library with the exception of “Janet Mary Riley: A Voice for Social Justice in Louisiana” and the New Orleans Opera Association Timeline.

and ingest into the digital library and Omeka) completed this work in about eleven hours, including assessment of which images to upload and location of high-quality copies of these images in digital storage.

Analysis

Impact data for the Wikimedia Commons uploads and Wikipedia edits was gathered from several sources after nine and a half months in May 2019, set to roughly correspond with the period of access and use data collected prior to the wiki edits from October 2017 to mid-July 2018. Wikimedia Commons provides reuse data for image placement on other wikis, which was documented for each upload. The Google Image “Search by Image” function was used again to find instances of reuse for the newly uploaded Wikimedia Commons images. Google Analytics for the Louisiana Digital Library and the LUNO library website (which hosts the New Orleans Opera Association Timeline) were also gathered for the period preceding and following Wiki edits.³⁶ Analysis was completed by the same librarian who originally uploaded the images and edited the Wikipedia articles, requiring approximately fifty hours of labor to gather and analyze the data.

Results

Wiki Reuse

Of the ninety-eight images uploaded to Wikimedia Commons, only seven were reused for a total of twelve instances of reuse on Wikimedia Commons and other wikis. One of these was placement by the author of one of the Janet Mary Riley images on the newly published Wikipedia article; this article was then duplicated to two non-English wikis and to Wikidata. One of the wiki reuse instances was an incorrect placement of a LUNO building image on the Wikipedia article for another university. The remainder of file usage on other wikis comprised pages auto-generated by Wikimedia Commons such as “new user uploads” and image galleries generated by bots based on image categories.

Google Analytics

Google Analytics pageviews, landing pages, and referrals were analyzed for two time periods: October 1, 2017–July 16, 2018, or prior to the Wikimedia Commons and Wikipedia edits; and July 19, 2018–April 30, 2019, to analyze traffic after the edits. Both of these time periods include some slower months when academic use of the library’s resources tends to dip, particularly December, June, and July. Google Analytics for all of LUNO’s items in the Louisiana Digital Library for October 1, 2017–April 30, 2019, do not show noteworthy changes in numbers of users or sessions across the months analyzed, and the only significant dip in pageviews occurred (inexplicably) in December 2018. Previous analysis of the library’s special collections and archive collections and research requests has shown that outside researchers unaffiliated with the university are some of the most frequent users of the collections, so it does not appear that the academic calendar

³⁶ Google Analytics were not available for the Janet Mary Riley exhibit as the Omeka version used at the time this project started did not allow Google Analytics. The site has since been upgraded, and analytics are available as of February 2019, but there is no comparison data for previous months.

significantly affects usage of digital collections and, potentially, the same materials hosted on Wikimedia Commons or referred to on Wikipedia.

Before any edits were made to wikis, Wikimedia projects accounted for 3 percent of traffic referred to all of LUNO’s items and collections in the Louisiana Digital Library. Wiki websites ranked sixth out of fifty-one referring sites to these collections. After Wiki edits were made, Wikimedia projects accounted for 4 percent of traffic referred to these same collections and items, and Wiki websites ranked fifth out of forty-four referring sites to these collections. However, pageviews for collections and items included in the case study actually saw a decrease of 27 percent after edits to wikis were made (fig. 1), though individual items linked in Wikipedia articles (as opposed to whole collections, exhibits, or timelines) saw slight increases in pageviews (fig. 2).

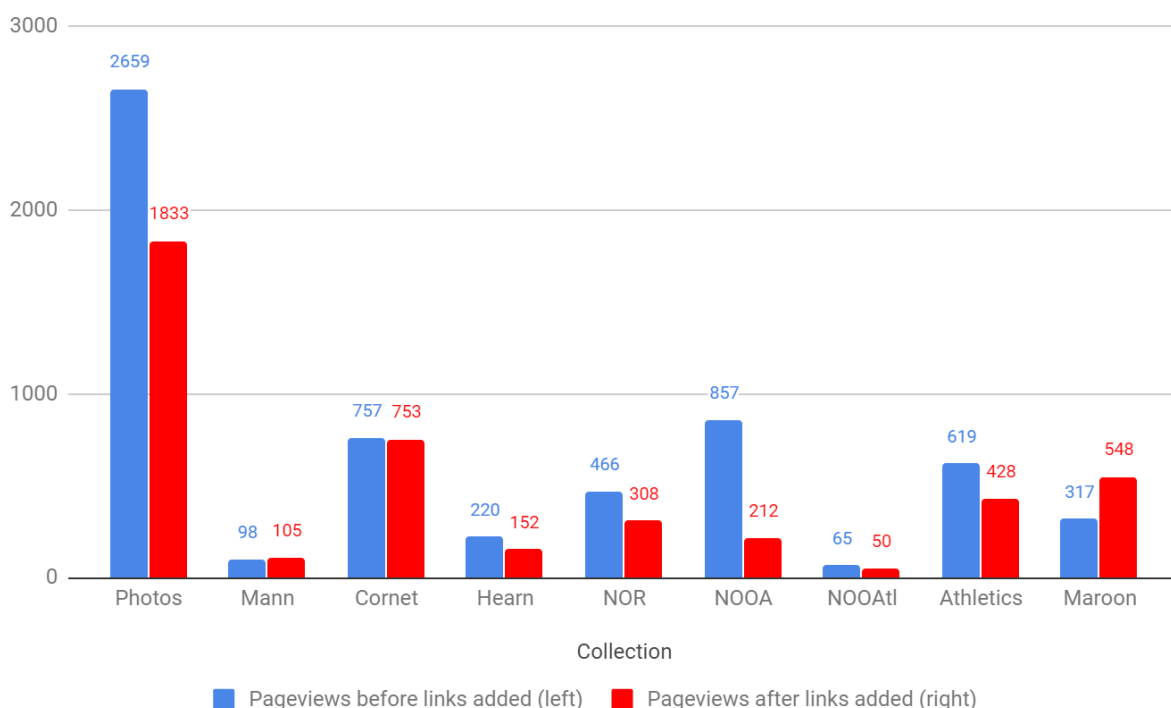


Figure 1. Pageviews for collections linked on Wikipedia or uploaded to Wikimedia Commons (see appendix 1 for abbreviations)

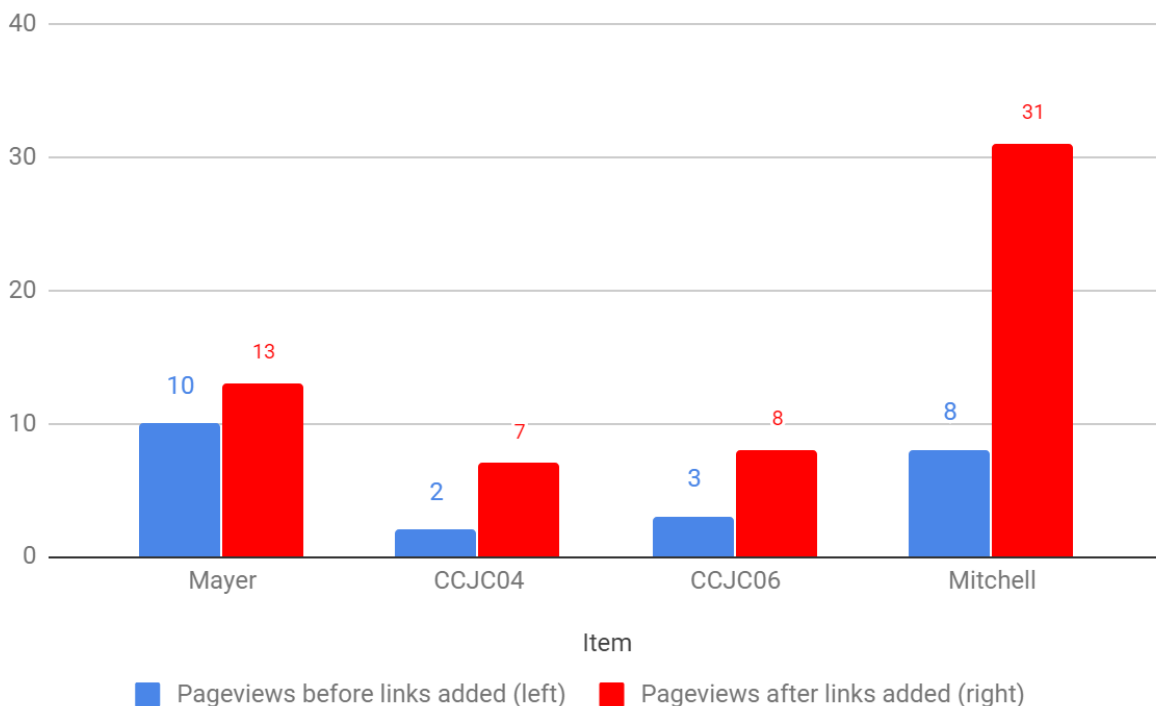


Figure 2. Pageviews for individual items linked on Wikipedia (see appendix 1 for abbreviations)

For comparison, pageview traffic for the entire Louisiana Digital Library increased by 10 percent during the same time period, and pageviews for LUNO collections and individual items increased by 18 percent.

Although overall traffic from wiki sites to LUNO’s digital collections only saw a slight increase, sessions in which the landing pages for the digital collections and items added to Wikipedia and Wikimedia Commons were the initial page used to enter the digital library were also analyzed to see if traffic going directly to these pages increased. There was a 20 percent increase in sessions with landing pages for collections and items linked in Wikipedia articles and Wikimedia Commons (fig. 3, table 1).

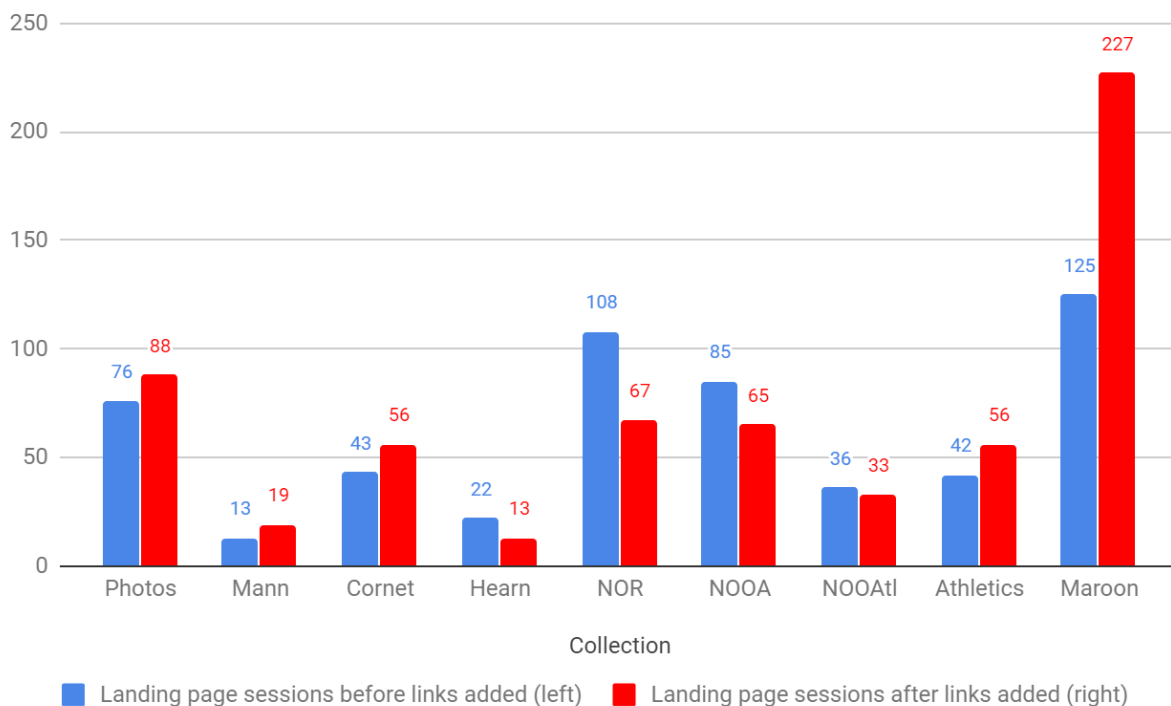


Figure 3. Landing page sessions for collections linked on Wikipedia or uploaded to Wikimedia Commons (see appendix 1 for abbreviations)

	Pageviews before	Pageviews after	Landing page before	Landing page after
Photos	2659	1833	76	88
Mann	98	105	13	19
Cornet	757	753	43	56
Hearn	220	152	22	13
NOR	466	308	108	67
NOOA	857	212	85	65
NOOAtl	65	50	36	33
Athletics	619	428	42	56
Maroon	317	548	125	227
Mayer	10	13	0	4
CCJC04	2	7	0	4

CCJC06	3	8	0	6
Mitchell	8	31	0	20

Table 1. Pageviews and landing page sessions for collections and items added to Wikipedia and Wikimedia Commons (see appendix 1 for abbreviations). Yellow highlighting signifies instances in which traffic increased after the edits were made.

Google Reverse Image Lookup

While the addition of LUNO’s digital images to Wikimedia Commons did not increase traffic to LUNO’s digital collections, reuse of these same images outside of the Wikimedia landscape saw a huge increase. Prior to uploading images to Wikimedia Commons, the Google Image “Search by Image” function identified thirteen instances of reuse, four each from the LUNO University Photographs and *Deutschlands wildwachsende Arzneypflanzen*, and five for the images from the Janet Mary Riley exhibit. Nine and a half months after the images had been uploaded to Wikimedia Commons, Google Image found 130 instances of reuse—a 900 percent increase—with the largest number of reuse instances using images from the LUNO University Photographs collection (fig. 4).

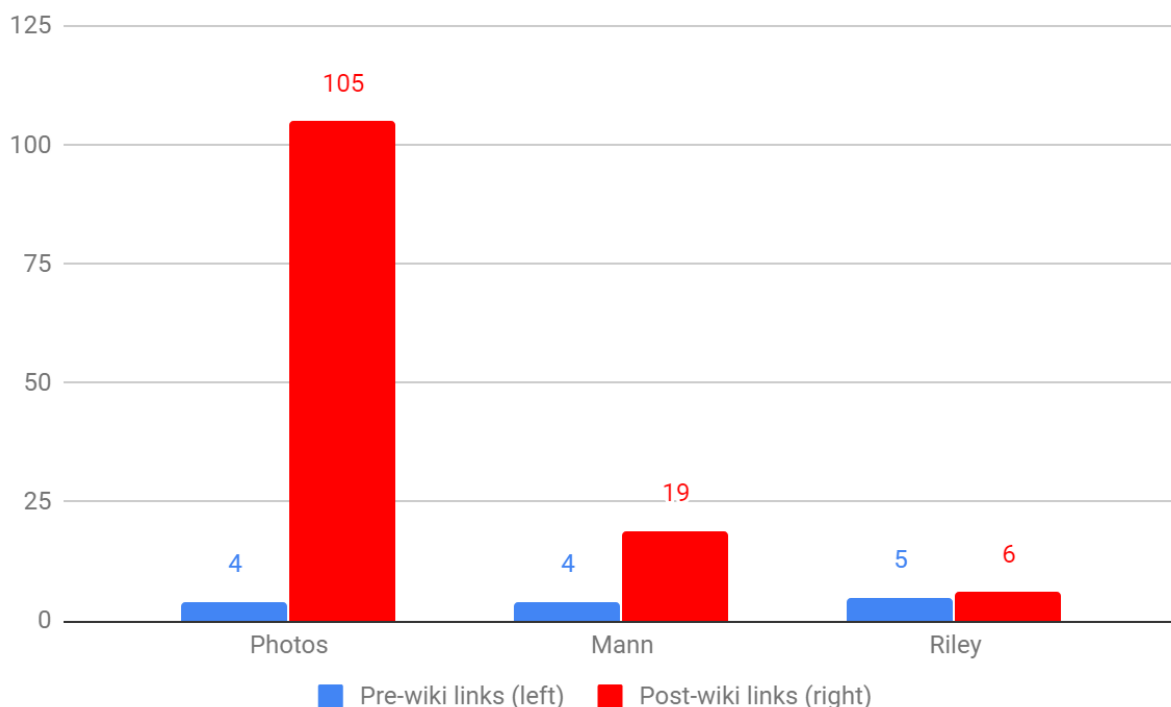


Figure 4. Google Image reuse results before and after wiki links

Images were primarily reused in media galleries, particularly stock image websites like Alamy, which seem to crawl Wikimedia Commons to find freely reusable media.³⁷ Some of these stock image websites also sell printed or high-resolution copies of the images, so commercial websites were frequently documented. Social websites like Tumblr blogs similarly included a significant number of reused images (fig. 5).

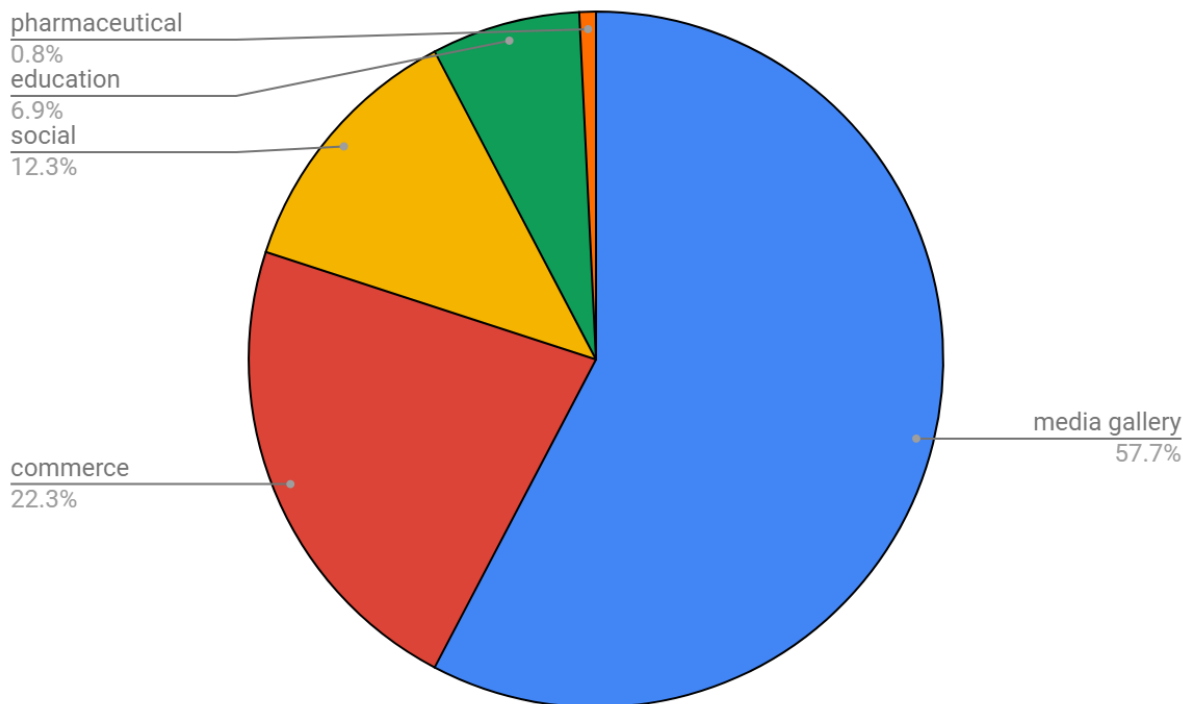


Figure 5. Content of websites with reused images

LUNO University Photos saw the biggest increase in reuse, with a 2,525 percent increase. Reuse of images from *Deutschlands wildwachsende Arzneypflanzen* increased by 375 percent and Janet Mary Riley by 20 percent.

Discussion

This study found that, while linking digital cultural heritage collections and items in Wikipedia articles did not result in increased traffic to institutional websites and digital libraries, uploading images to Wikimedia Commons did lead to large increases in content reuse outside of wiki projects. However, this project lays the groundwork for some additional steps that may lead to further engagement with the digital library.

Danielle Elder, R. Niccole Westbrook, and Michele Reilly discuss the positive results they saw when they not only added images from their collections to Wikimedia Commons but also added

³⁷ <https://www.alamy.com>.

those images to relevant Wikipedia articles, including non-English Wikipedia articles.³⁸ While the study detailed in this article only used that technique once, placing an image of Janet Mary Riley on a newly created article about the pioneering lawyer, doing so did increase reuse both on and off wikis. Further efforts of this kind should be undertaken and the web analytics assessed to see if users are more likely to engage with digital cultural heritage images when they are embedded and contextualized in articles, rather than just within Wikimedia Commons.

The same study from Elder and colleagues recommends adding additional specific categories to images uploaded in Wikimedia Commons in order to increase visibility.³⁹ While the categories originally used for the Wikimedia Commons uploads in this study were selected based on broad, assumed interest areas, there are likely countless other categories that could increase the likelihood that users find LUNO's uploaded images while browsing Wikimedia Commons. Additional reuse assessment using Google Image might also reveal whether the number and specificity of categories used for Wikimedia Commons images has an impact on reuse volume.

Reuse of the LUNO University Photographs Collection skyrocketed after the selected images were uploaded to Wikimedia Commons. Unlike the other two collections selected for Wikimedia Commons uploads, these photographs are a largely unique collection that was suspected to have a niche audience. The major increase in reuse might point to wider appeal of these images than was initially assumed. However, much of the reuse was the result of web crawling by stock photo websites that aggregated images and then, sometimes, sold them for profit. Cultural heritage institutions may not value this type of reuse in the same way as human reuse, and in fact may instead utilize this type of assessment to track down nefarious or unwanted reuse of materials. While the aggregation and monetization of the public domain university photographs is entirely legal, would the reuse increase show desired impact when reporting the significance of the collection and its use to stakeholders? Or would reuse data representing citations or use of photographs in print publications, educational blogs, and news media better show the worth of the digital collection? The answers to these questions will vary by institution and should be determined in conjunction with discussion of organizational mission and the objectives of specific assessment campaigns. In addition, best practices for defining and assigning meaning to different types of reuse are needed to aid institutions in meeting their particular assessment goals.

Since pageviews on LUNO's digital library collections for images uploaded to Wikimedia Commons decreased after they were added, does that mean users are finding what they need through Wikimedia Commons and therefore do not need to access the digital library? Or would better, more thorough metadata for the items in Wikimedia Commons lead users to want to search the Louisiana Digital Library for related items? And why did access for LUNO collections in the Louisiana Digital Library, and for the collections cited on Wikipedia articles, decrease? Further monitoring of web analytics is necessary to see if the decrease in pageviews for collections and items linked to wikis is an anomaly.

This case study involves a relatively small number of collections and objects added to wiki projects, and the sample size, particularly as to Wikipedia edits, might be nonreplicable. In addition, some of the projects detailed in the literature review resulted in hundreds of Wikipedia

³⁸ Elder, Westbrook, and Reilly, "Wikipedia Lover, Not a Hater," 42.

³⁹ *Ibid.*

articles edited, so the volume of edits may correspond to the volume of increased engagement (though others saw impressive results with a single upload to Wikimedia Commons, so more research is needed to back this theory).⁴⁰

As some of the other cultural heritage institutions discussed previously saw success working with student workers to develop wiki editing programs, LUNO might benefit from embedding wiki editing into coursework or work study assignments to expand on this program. This issue of labor is an important one in determining whether there is sufficient merit for a cultural heritage institution to engage in a wiki editing/uploading project. Previous case studies involving cultural heritage work with wiki projects do not always make clear how many items or edits were made through the course of the project, nor are the hours and number of staff involved in the project always described. This case study attempts to be transparent in how many staff (one) and how many hours (eleven for initial editing and uploading, fifty for analysis) were needed, to clarify what an institution's human resource investment might be in attempting a small-scale wiki editing project. As previously mentioned, many of the institutions reporting "successful" wiki editing projects have been large, well-resourced institutions, so this too may affect the ability not only to start such a campaign but also to sustain it, especially if staff turnover occurs during the project. Various, if the institution's goals are to engage students with research and online resources, then projects that center wiki editing and cultural heritage materials in coursework or internships may still be feasible and valuable regardless of whether traffic to the institution's digital resources increases.

Further analysis and better documentation in future cultural heritage wiki projects may allow for the development of a return-on-investment assessment tool for determining whether the time and resources needed will result in great enough use and reuse to merit such a program. The Digital Library Federation's Digitization Cost Calculator, for example, is a tool in which the number of scans, financial investment (salary or hourly rate plus benefits for staff), equipment, and processes to be performed are entered in order to determine the cost and time involved in digitization; a similar tool could benefit cultural heritage institutions in developing and planning outreach and assessment projects.⁴¹

Finally, while web analytics and image reuse give some sense of the quantitative and qualitative effects of connecting digital cultural heritage to wiki projects, the benefit to users of wiki projects is much more difficult to assess. James Morley's "impact factor" measurement for images uploaded to Wikimedia Commons attempts to tackle this, but how can the benefit of additions to Wikipedia articles be measured? Wikipedia provides some tools, such as the ability to thank another Wikipedian for their edits, but this is anecdotal at best. As reported by the Wikimedia Foundation's "Supporting Commons Contribution by GLAM Institutions" research project, "donating media to Commons is a means to an end. GLAM organizations and the volunteers who work with them want to know the media they upload is being used, and to be able to evaluate the impact of their donations against institutional goals."⁴² Web analytics fail to paint a complete picture of reuse, and differentiating between human and machine use and reuse may be needed to truly show the significance of digital collections. Therefore, if the goal of cultural heritage

⁴⁰ Perrin et al., "Know Your Crowd."

⁴¹ <https://dashboard.diglib.org>.

⁴² "Research: Supporting Commons Contribution by GLAM Institutions."

institutions working with wikis is to improve access to knowledge and cultural heritage (rather than to increase web traffic), how can institutions determine whether they are succeeding? Perhaps tracking scholarly, student, and web citations to Wikipedia articles enhanced by information from cultural heritage collections could provide some insight; or further interviews with Wikipedia users as to how the content of Wikipedia could be improved by cultural heritage institutions; or even assessment of the quality of Wikipedia articles with and without cultural heritage additions could be starting points. Regardless, more qualitative research is needed, as is the development of best practices and tips for this type of assessment.

Conclusion

This article provides details on how cultural heritage institutions can begin a wiki editing project as well as a variety of ways to assess the impact of such an undertaking. These techniques add to the body of existing research in this field and augment the use of web analytics, the assessment tool currently most adopted by cultural heritage professionals. While the results of this study show that increases in web traffic to digital collections and websites for cultural heritage institutions may not always occur after linking to collections and digital libraries on Wikipedia, the protocols and tools detailed here should provide a model to evaluate the efficacy of engaging in such projects. Uploading images to Wikimedia Commons resulted in much greater reuse of these images outside of wiki projects, but a specific institution's aims and goals in increasing access, particularly in an online environment where machine reuse and aggregation may be seen as less noteworthy than human reuse, must be taken into consideration. The addition of new methods for assessing the impact of digital cultural heritage collections gives greater awareness of successful marketing and outreach efforts to cultural heritage professionals. While more case studies and research on the effectiveness of linking digital cultural heritage on wiki projects, specifically for institution types less represented in the literature, is still needed, this article provides methods that can be adopted by small institutions for similarly scaled projects.

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Appendix A. Collection Names and Abbreviations

Collection or Item Name	Code
Joseph-Aurélien Cornet, FSC, Collection	Cornet
Janet Mary Riley: A Voice for Social Justice in Louisiana (exhibit)	Riley
Lafcadio Hearn Correspondence Collection	Hearn
Loyola University Athletics Collection	Athletics
Loyola University Photographs Collection	Photos

Johann Gottlieb Mann, <i>Deutschlands wildwachsende Arzney-pflanzen</i> (Stuttgart: Zu haben bei dem Herausgeber, 1828)	Mann
Loyola University Maroon Newspaper Collection	Maroon
New Orleans Opera Association Archives Collection	NOOA
New Orleans Opera Association Timeline	NOOAtl
New Orleans Review Collection	NOR
Crescent City Jockey Club Program, March 1 1904	CCJC04
Crescent City Jockey Club Program, January 3 1906	CCJC06
Henry Mayer, <i>In Laughland</i> (New York: R. H. Russell, 1899)	Mayer
S. Augustus Mitchell, <i>Mitchell's Ancient Atlas, Classical and Sacred</i> (Philadelphia: Butler, 1844)	Mitchell