SHINING LIGHTS: MAGIC LANTERNS AND THE MISSIONARY

MOVEMENT, 1839—1868

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guides and interlocutors than Jo Ichimura at SOAS, Ivana Fralan at the University of Birmingham, Anne Martin and Karen Carruthers at the David Livingstone Centre, Alison Metcalfe and David McClay at the National Library of Scotland, and Phil Wickham at the Bill Douglas Cinema Museum. The lion share of my archival research was funded by Indiana Univeristy's Office of the Vice Provost of Research through the Mellon Innovating International Research, Teaching, and Collaboration Dissertation Research Fellowship. For photographs of slides, I am indebted to Margreet Wagenaar, Annet Duller, Trevor Beattie, Terry and Debbie Borton, and Peter Gillies who generously donated images of slides from their collections. And for the show-stopping 3D model of the improved phantasmagoria lantern, I owe many thanks to Katie Chapman and Tassie Gnaidy of CyberDH.

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Preface

This dissertation was submitted to the committee and defended as a website: http://scalar.maryborgoton.com/shininglights. The author encourages the reader to explore the dissertation's content in this digital-born form. This document functions as a partial remediation of the dissertation's prose content. It was submitted in accordance with the University Graduate School's Guidelines.

The table of contents reflects the content of this PDF, not the dissertation itself. For the dissertation's table of contents, see "Remediation of the dissertation's main outline."

Mary Elizabeth Borgo Ton

SHINING LIGHTS: MAGIC LANTERNS AND THE MISSIONARY MOVEMENT, 1839—

1868

This dissertation excavates the global history of early screen culture by studying the letters, journals, and published narratives of missionaries who used projection equipment to supplement their spoken presentation of Christianity with visual material. As the most detailed eye-witness accounts of magic lantern shows on the fringes of the empire before the advent of photography, these primary sources enable me to reconstruct images that missionaries presented to audiences in the South Pacific and Africa, explore the local context of these events, and discuss the representation of magic lantern shows in textual sources. Far from being a one-way transmission of religious thought, magic lantern shows invited reciprocal performances from their audiences, ranging from lavish displays of wealth to tearful silence to raucous joke-telling. I suggest that these unscripted moments speak to the ways that audiences co-opted lantern shows as a means to negotiate their relationship to Christianity and to the empire. By foregrounding the contributions of audiences in the global south and "native" missionaries to magic lantern shows, I challenge Euro-centric histories of early screen culture. These case studies focus on four luminaries within the Victorian missionary movement: John Williams, David Livingstone, Samuel Crowther and his son Dandeson. Drawing from media studies and anthropology, I argue that magic lantern shows and their subsequent representation in text are best understood as moments of mediation. Textual accounts of lantern shows function as records of a multisensory event and as the material expression of embodied cultural practices. Excavating the layers of representation that have accrued over time results in a mode of analysis that I characterize as an "archaeology of mediation." This dissertation takes the form of a website,

http://scalar.maryborgoton.com/shininglights, in order to reflect on the analog and digital technologies that shape our view of nineteenth-century lantern shows. As a study of the nineteenth-century screen experience, this dissertation explores the potential for digital publishing platforms to offer interactive, virtual encounters with archival material. The pdf contains the website's introduction, table of contents, and bibliography. The supplemental files remediate the website's content and its visual design.

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Contents

Remediation of the dissertation's main outline

The following table of contents appeared in the navigational bar of the website. It functions as primary path through the dissertation's content. For alternate paths through the material, see "Layers in Focus."

Remediation of the dissertation's preface

The footnotes in this section were originally formatted as hyperlinks.

Although this project began as a document, it developed into a more colorful and dynamic presentation of textual and visual material through its conversion into website. Privileging the website as the primary form of this dissertation reflects ongoing conversations about alternative forms of scholarship at a faculty and graduate student level. By offering a brief summary of similar projects, I will situate this project within its scholarly milieu.

Digital projects at a faculty level have adopted two strategies for publishing a website and a monograph simultaneously. Matthew F. Delmot's The Nicest Kids in Town (University of California Press, 2012)[1] was published by the University of California press as a physical monograph with a companion Scalar site.[2] The website contained additional visual and photographic material that could not be represented in the print edition. The website does not represent all of the book content; instead, the digital companion summarizes Delmot's key arguments and digitally publishes close readings of additional visual material. Sean Silver's The Mind is a Collection (UPenn Press, 2016) imagines a different relationship between the website and the monograph. Rather than see one form of publication as subservient to the other, Silver describes both as two outcomes of the same project. The custom-built website[3] functions as a virtual museum of eighteenth-century cognitive models, and the monograph[4] serves as a catalogue of this exhibition. While the digital exhibition received widespread acclaim, it was the

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[1] https://www.ucpress.edu/book.php?isbn=9780520272088
[2] http://nicestkids.com/nehvectors/nicest-kids/index
[3] http://www.mindisacollection.org/
[4] http://www.upenn.edu/pennpress/book/15446.html

publication that received the 2016 Kenshur Prize for its contribution to eighteenth-century studies.

The companion site (or in Silver's case, the companion publication) is ideal for scholars pursuing tenure, for it makes the scholarly labor of the digital project legible to an audience most familiar with document-based scholarship. When I began writing this dissertation as a document in May 2015, there were few models of digital-born scholarship, particularly within tenure dossiers. Since then, the Modern Language Association and the American Historical Association have been advocating for increasing flexibility in job evaluation materials in order to accommodate digital-born scholarship. This advocacy has resulted in robust frameworks for reviewing scholarly work, including the MLA's "Guidelines for Evaluating Work in Digital Humanities and Digital Media"[5] and the AHA's "Guidelines for the Professional Evaluation of Digital Scholarship By Historians."[6] Conversations about faculty scholarly labor have not only led to revised criteria for tenure but have also opened spaces for alternative forms of dissertations. In late 2015, George Mason University created guidelines for History and Art History digital dissertations[7] that proposes structuring a sustained scholarly argument into a framing introduction, a series of "modules," bibliography, and a reflection on the project's development. The "module" functions as a unit of measure roughly equivalent to the chapter in a document-based dissertation. "Shining Lights" follows the practices laid out in GMU's rubric by segmenting my analysis into case studies. Rather than characterize these as "modules," I evoke the conventions of document-based scholarship by referring to these sections as "chapters" in

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[5] https://www.mla.org/About-Us/Governance/Committees/Committee-Listings/Professional-Issues/Committee-on-Information-Technology/Guidelines-for-Evaluating-Work-in-Digital-Humanities-and-Digital-Media
[6] https://www.historians.org/teaching-and-learning/digital-history-resources/evaluation-of-digital-scholarship-in-history/guidelines-for-the-professional-evaluation-of-digital-scholarship-by-historians
[7] https://historyarthistory.gmu.edu/graduate/phd-history/digital-dissertation-guidelines

order to convey their scope. The dissertation's concluding chapter describes the dissertation's development as well as its design, structure, and visual rhetoric, thereby situating the reflective component of the digital dissertation more centrally in its structure.

In this manner, "Shining Lights" joins a growing body of dissertations that experiment with form in order to support sustained scholarly analysis. For "Infinite Ulysses," Amanda Visconti designed and built a digital edition of James Joyce's Ulysses in order to test how the edition's interface promoted social reading practices (MIT, defended April 2015).[8] Other web-based dissertations, particularly those that use Scalar, curate multimedia assets, including soundbites, photos, and videos. Dwayne Dixon's "Endless Question" (Duke University, defended 2014)[9] and Celeste Sharpe's "They Need You!" (George Mason University, defended 2016)[10] build cultural histories through heavily annotated visual material. Unlike the companion site model, these dissertations construct arguments made possible by their digital form. In addition to web-based expressions of research, this dissertation resonates with other graduate student projects that break with document-based scholarship in order to engage with the scholarly ecologies that they inhabit. Nick Sousanis' comics dissertation and subsequent book, Unflattening (Teachers College, Columbia University, 2014; Harvard University Press, 2015), explores semiotics and epistimology through visually and textually shifting perspectives. Its design supports and advances the content of the prose. More recently, dissertations reflect on sonic material and their context by adopting sonic forms. A.D. Carson and Anna Williams analyze knowledge production through two genres. Carson's "Owning my Masters" (Clemson University, defended 2017)[11] takes the form of a rap album to challenge previous scholarly

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[8] http://dr.amandavisconti.com/
[9] http://scalar.usc.edu/students/endlessquestion/index
[10] http://celestesharpe.com/projects/research/
[11] https://phd.aydeethegreat.com/

approaches to hip hop, its historical context, and its representation in subsequent scholarship. Similarly, Anna William's "My Gothic Dissertation,"[12] presented in podcast form, reflects on her graduate school experience specifically and the current academic landscape more broadly through a comparison of current educational practices and those portrayed in gothic novels. In each of these cases, the dissertation's argument emerged more naturally from the content thanks to formal affinities between the objects of analysis and the medium used to express their interpretation of that material. As you will see in this dissertation's revision history, the move from document-based to web-based dissertation dramatically shifted the argument that this project makes. The website form of this dissertation parallels the visually-oriented nature of the magic lantern show, enabling a seamless presentation of audio-visual material alongside analytical prose. By placing form and technologies of mediation centrally in my exploration of nineteenth-century visual culture, I expose my own role as mediator in order to further investigate the misrepresentation of local audiences in nineteenth-century magic lantern shows. This focus on mediation animates the dissertation's narrative structure. While graduate students and faculty have used Scalar as a scholarly publishing platform, this dissertation represents the most extensive exploration of Scalar's multi-linear narrative capabilities. In addition to its primary path, the dissertation offers sustained, cross sectional studies of the technologies that shape our view of nineteenth-century events. The following introduction provides an overview of these paths while also situating the dissertation's content within the context of nineteenth-century magic lantern shows, the missionary movement, and relevant scholarship on these topics.

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[12] https://www.annawilliamsweb.com/my-gothic-dissertation.html

Remediation of the dissertation's introduction

> *Let your light so shine before men, that they may see your good works,*
> *and glorify your Father which is in heaven.*
> *Matthew 5:16 KJV*

This dissertation tells the story of shining lights within the nineteenth-century missionary movement. During this period of rapid technological development, missionaries marshalled physical illumination to promote spiritual insight. Thanks to portable magic lanterns and glass slides, missionaries like John Williams, David Livingstone, Samuel Crowther and his son Dandeson could communicate with an increasingly diverse range of potential converts by supplementing their spoken presentation of the gospel with visual material. Projection equipment made it possible to literally and figuratively "shine their light before men." Although circulating lanterns was not their primary goal, missionaries' efforts to spread Christianity produced what I would characterize as the first global screen culture. Projected images could transcend linguistic barriers in the South Seas and in Africa by conveying information visually rather than verbally. While these magic lantern shows were designed to inspire religious conversion, audience members often responded to the images on screen in ways that the missionaries did not expect. These responses ranged from lavish displays of wealth to tearful silence to raucous joke-telling.

In order to reconstruct the content of these magic lantern shows and their cultural contexts, I rely on textual sources to trace when and where these lantern shows occurred. I then compare descriptions of images in text to extant examples of slides and lanterns. Rather than reading textual sources primarily as accounts of lantern shows, I analyze physical ephemera as records of intercultural contact and exchange through case studies that center around four missionaries who were well-known in the nineteenth-century. Restoring the cultural context of these lantern shows reveals the ways that audiences co-opted lantern shows in order to negotiate

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their relationship to Christianity and to the empire. Before doing so, I must first describe the historical factors that led to the global distribution of lantern slides, particularly the industrialization of slide manufacture. I then survey approaches to nineteenth-century magic lantern shows within scholarship on missionary activity and within pre-cinema studies. I draw from theories of mediation in media studies and anthropology to address the duality of textual sources as records of magic lantern shows and as representations of the cultural forces at play in the creation of these records. In doing so, I characterize the dissertation as an "archaeology of mediation" which excavates the layers of technology that shape representations of nineteenth-century magic lantern shows in physical and digital forms.

The Mechanization of Slide Production

This section of the introduction included several embedded videos, the first of which featured Terry Borton describing the lantern show's history.[13] *For this document, I have added the URLs for the videos as footnotes.*

The video above provides a brief introduction to the magic lantern show, particularly as a forerunner to the cinematic moving image. The clip traces the lantern show's evolution from its place in early optical experiments, to its role in the gothic spectacle known as phantasmagoria, to late Victorian educational lectures. Histories of the moving image draw from extant examples of slides, illustrations of performance, and eyewitness accounts to study the content of lantern shows. As the clip suggests, researchers often bring an element of experimental archaeology to

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[13] https://youtu.be/Y59QgDRc_94

these reconstructive projects. In the video, Terry Borton, the producer and lead performer of the American Magic-Lantern Theater, demonstrates two modes of studying lantern ephemera. First, he introduces the "rat catcher" slide mechanical workings. The clip then cuts to the presentation of this slide in front of a live audience. The sequence closes with a nineteenth-century illustration of the rat catcher as part of an annual Sunday School treat. The juxtaposition between the slide as object and as a audio-visual experience exposes the implied liveliness of its presentation in nineteenth-century shows and in representations of this slide, particularly in illustrations. As is evident in the videos interspersed below, many introductions to the magic lantern as a forerunner of film and as a performance medium excavate the history of the lantern show through material ephemera.[14] Material ephemera like lanterns and slides speak to the ways that magic lantern shows evolved over time.

The period that I will study falls between two pivotal innovations in lantern slide production: the debut of Philip Carpenter's copperplate-printed slides in 1821 and the rise of photographic material in the 1870s. This particular period is often overlooked within histories of the moving image, including the clip above, for scholars tend to gravitate toward the lantern's early days as a gothic spectacle or toward their later apex as a vehicle for photographic images in late-Victorian and Edwardian England. The popularity of phantasmagoria and photographic material in scholarship is due in part to the accessibility of materials pertaining to magic lantern shows. In the case of phantasmagoria, illustrations of lantern shows and published eyewitness accounts help address the relative rarity of slides used in these performances. Furthermore, the

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[14] I have curated a longer list of videos pertaining to the magic lantern: https://www.youtube.com/playlist?list=PLS9QcPn1Fw1jp89VyQts4bUIJDcWT7fVr. The playlist includes introductions to magic lantern shows, material ephemera, and contemporary performance; recreations of magic lantern shows, spanning phantasmagoric demons and imps to mechanical slides to educational lectures; and remediations of magic lantern shows in film and video games.

visual vocabulary of these shows and their accompanying soundtrack persisted as visual tropes and sonic cues within gothic literature long after phantasmagoria ceased to be a popular entertainment. On the other end of the spectrum, the vast quantities of slides produced in the 1890s and after has meant that more photographic images have survived in private and public collections than their earlier, engraved counterparts. These photographic sets include numerous lantern shows created by missionaries while traveling abroad. The intervening period between 1821 and 1870, in which slide makers employed a partially mechanized manufacturing process, has been understudied due to the fragility and scarcity of the slides. Recent studies of Philip Carpenter's production techniques, particularly by Stuart Talbot and Philip Roberts, have placed Carpenter more centrally within the technological development of the magic lantern. I suggest that Carpenter's innovative approach to slide manufacture ultimately laid the groundwork for the global dissemination of projection equipment in the hands of missionaries.

Phantastic Beasts (and Where to Find Them)

The magic lantern show had a long and rather sordid history before Philip Carpenter arrived on the lantern scene. Christiaan Huygens and his contemporary Athanasius Kircher were among many European philosophers who engaged in optical experiments in the 1650s.[15] Spellbound by the lantern technology's almost supernatural ability to make figures appear and disappear out of thin air, performers adopted this novelty item in order to represent demons, ghosts, and imps. In the hands of itinerant street performers and professed mediums, magic lanterns entertained and amazed audiences across continental Europe. By the 1780s, the most

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[15] Franz Paul Liesegang. *Dates and Sources: A Contribution to the History of the Art of Projection and to Cinematography*. pp. 10-11.

enterprising of these showmen had transformed the magic lantern show into a gothic spectacle known as phantasmagoria, replete with ghosts that appeared out of smoke, devils that flew around the room, and skeletal figures that rushed towards the audience, only to vanish as suddenly as they appeared. These ghostly apparitions were often accompanied with sound effects, including claps of thunder, howling wind, and even the other-wordly sounds of the harmonium. In the video below, Mervyn Heard describes the multisensory nature of phantasmagoria, including the cabinet of curiosities and scientific demonstrations that preceded this type of lantern show.

Embedded here is a video clip of Mervyn Heard describing the elements of a typical lantern show featuring phantasmagoria.[16]

Performers like E. G. Robertson and Paul de Philipsthal (best known by his stage-name, Philador) dazzled Parisian audiences with shows that purportedly "lifted the veil" separating the living from the dead. Due to the relatively dim light produced by an oil lamp and the short throw of the lanterns that they used, their performances were relegated to small, dark rooms or crypts, which limited the size of the audience at each lantern show. Their petit reign of terror in France would be cut short by a fateful decision to cross over—the English Channel, that is—in 1801.[17] Philador's arrival in Britain at the height of the phantasmagoria craze ushered in a new era of technological innovation. Philador's mechanical improvements to the phantasmagoria lantern made it light and portable. Yet, the glass lenses that magnified the light and focused the image, as well as the glass slides, were difficult to mass produce.

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[16] https://youtu.be/c526W9YONdQ

[17] For an expanded discussion of phantasmagoria, see Mervyn Heard's *Phantasmagoria: The Secret Life of the Magic Lantern*. Hastings: The Projection Box, 2006. Print. and Deac Rossell's *Laterna Magica. Magic Lantern*. Trans. into German by Marita Kuhn. Vol. 1. Stutgart: Füsslin Verlag, 2008. Print.

Carpenter's Improved Phantasmagoria Lantern

An ambitious optician from Birmingham, Philip Carpenter, was the first to apply

industrial practices to manufacture lanterns' glass components in 1821. Through his experience

making microscopes and telescopes, Carpenter learned how to produce the large convex and

concave lenses on an unprecedented scale, meaning that he could manufacture the parts of the

lantern that magnified and focused light faster than his competitors. He earned widespread

acclaim for high-quality achromatic lenses for telescopes and microscopes. According to one

Victorian historian writing in 1866, Carpenter "had raised telescopes from mere toys to

philosophical instruments" because his lenses allowed for a greater power of magnification

without distorting color.[18] Carpenter applied advanced lens-making techniques to refine the

design of projection equipment. By pairing two bi-convex lenses, Carpenter discovered a better

way to focus the lantern's light source. This design feature not only created a brighter image but

also reduced the amount of fuel needed to do so.

Carpenter made a second major breakthrough when he adapted copperplate printing to

slide production. Before this development, all images had to be hand-painted onto the surface of

the slide. Inspired by the ceramic factories of Birmingham, copperplate printing made it possible

to quickly and efficiently stamp the outlines of the image onto the glass; these outlines would

then be chemically etched into the glass' surface. Carpenter's printing techniques did not fully

mechanize slide-making, for slides needed to be hand painted after the outline had been burned

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[18] Samuel Timmins, *The Resources, Products and Industrial History of Birmingham, 1866*, p. 534, quoted in Stuart Talbot's, "The Perfectionist Projectionist: Philip Carpenter, 24 Regent Street, London," *Bulletin of the Scientific Instrument Society*, no. 88, 2006, p. 17, accessible via Howard Lynk's website on early microscopes. Talbot's article offers a more detailed history about the formation of Philip Carpenter's company, his subsequent move to London, and his inventory of magic lanterns, microscopes, kalaidoscopes, and telescopes. For more information on the need for double lenses to condense the light, see "The Optical System of the Lantern" in T.P. Hepworth's *The Book of the Lantern*, Hazell, Watson, and Viey, Ld., 1899, reprinted by Arno Press Inc., accessed via interlibrary loan from the University of Illinois Library, 1978, pp. 16-29.

into the glass. It did, however, dramatically reduce the time needed to manufacture slides. Carpenter included a description of the improved lantern in Elements of Zoology (1823), a volume which functioned as a script to a set of copperplate-printed zoological slides. While the advertisement at the end of the book did not contain the prices of the equipment on offer, it provided a snapshot of his inventory. The bulk of this advertisement described slides that depict "costumes," both ancient and modern, European and non-Western. Such content reveals an early demand for slides that enabled imagined encounters with those who lived in the South Pacific, India, and Central Africa. The rest of the advertisement listed material that would make its way into the hands of missionaries: images of animals, plant life, astronomical diagrams, portraits of the kings of England, views of buildings, and humorous subjects.[19]

These two innovations made Carpenter so successful that he moved his shop from Birmingham to London in 1826. As Stuart Talbot notes, the shop's close proximity to Westminster Bridge allowed Carpenter to take full advantage of the new oxy-hydrogen gas that lit London.[20] Oxy-hydrogen light, better known as limelight, burned brighter than the oil lamps that had lit the previous generation of lanterns. This meant that lanternists could draw bigger crowds, transforming the lantern show from a mostly private affair to a public spectacle. Unlike the telescope and the microscope which had been lifted from the world of entertainment into academic pursuits, the popularity of the lantern stemmed from its use as both a "toy" and a source of instruction. Carpenter offered sets of slides and readings that ranged from comic material designed for pure entertainment to lectures on astronomy, zoology, and biblical

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[19] Phillip Robert describes how Carpenter responded to the increasing demand for scientific entertainment in domestic settings. Roberts' article argues that Carpenter's ability to produce scientific instruments and optical toys like the lantern placed him at the forefront of this market. See "Philip Carpenter and the convergence of science and entertainment in the early-nineteenth century instrument trade," *Sound and Vision*, no. 7, 2007, DOI: http://dx.doi.org/10.15180/170707, accessible via the Science Museum Group Jounral (UK).
[20] Talbot, p. 17.

material. By applying printing techniques to slides and readings, Carpenter made lantern material widely available to educators, entertainers, and amateur lanternists. Unfortunately, Carpenter would not see the results of his innovative approach to optics, for he died on April 30th, 1833. His sister Mary took over the firm in partnership with William Westley who had been an apprentice to Carpenter during the company's early years in Birmingham. In 1835, William and Mary released the culmination of company's technological advancements—Carpenter & Westley's "improved phantasmagoria lantern."

Carpenter and Westley's improved phantasmagoria lantern would represent one of the most enduring forms of projector, inspiring manufacturers to copy his design by producing lanterns like the one below.

An interactive, 3D model of an improved phantasmagoria lantern, built by Cyberinfrastructure for Digital Humanities, is embedded here.

Like its predecessors, Carpenter's improved phantasmagoria lantern was designed operate in complete darkness. The topmost part of the chimney, which is missing here but is present in this example in the Bill Douglass Museum,[21] bent at a 45 degree angle to limit the amount of light emanating from the lantern. The improved phantasmagoria lantern could be used with paraffin lamps or with the more powerful limelight. The model above was designed to be used with an oil lamp, for it lacks the slit in the back for oxygen and hydrogen tubes (Annotation 5).

The slides designed to accompany this projector reflect the changing tastes within Victorian entertainment. This shift eliminated ghosts from the lanternist's repertoire in favor of dazzling special effects that could be accomplished with two or more lanterns. Henry Langston

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[21] http://www.bdcmuseum.org.uk/explore/item/69004/

Childe developed a sequence of "dissolving views" in which one image slowly faded while another came into view. The most famous of these scenes involved a mill in summer which transitioned into a wintry landscape, a version of which can be seen in the clip below.

The webpage includes a video with several of these visualizations.[22] In the clip, cinema scholar John Plunkett describes how the lantern served as a source of inspiration for Charles Dickens.

The clip also contains an example of how Victorians used the rapid transitions accomplished by a sliding piece of glass for comic effect. Slippers, levers, and rachwork mechanisms simulated movement, creating images of ships rocking back and forth in the waves[23] to kaledescopic swirls of colors[24] to depictions of the planets rotating around the sun.[25]

Commercial manufacturer's shied away from depicting the demons and imps that had once dominated lantern shows, but that is not to say that phantasmagoria disappeared entirely. The Adelphi's 1826 production of The Flying Dutchman used a lantern in order to make the eponymous vessel appear at the end of Act 1.

A digital copy of an engraving depicting this scene is embedded here.

The directions of the shadows in this illustration by Isaac Robert Cruikshank indicate that the lantern was positioned behind a screen, a configuration favored by phantasmagors. Projection would continue to be a key feature of ghostly apparitions on stage, culminating in the debut of

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[22] https://youtu.be/omuDMHj0TZY

[23] https://www.youtube.com/watch?v=t74_ZB4lIpc&amp=&list=PLS9QcPn1Fw1jp89VyQts4bUIJDcWT7fVr&amp=&index=16&amp=&t=0s

[24] https://www.youtube.com/watch?v=O_N0rKxjwLo&amp=&list=PLS9QcPn1Fw1jp89VyQts4bUIJDcWT7fVr&amp=&index=17&amp=&t=0s

[25] https://www.youtube.com/watch?v=DvSyXKCT1Nk&list=PLS9QcPn1Fw1jp89VyQts4bUIJDcWT7fVr&index=14&t=0s

Pepper's Ghost in an 1862 production of Charles Dickens' *The Haunted Man* at the Royal Polytechnic Institute. In addition to these, the lantern also functioned as literary inspiration. As John Plunkett suggests in the clip above, Dickens positioned the lantern as an integral part of his writing process. Joss March has shown that Dickens drew from the visual tropes and narrative techniques of magic lantern shows in order to structure the appearance of the ghosts in *A Christmas Carol*.[26]

The Arrival of Photography

Evangelists, missionaries, and social reformers also positioned the lantern as a vehicle for moral reform. The increasing portability of camera equipment and the rapid development of photography opened new directions for lantern shows. As they traveled to the fringes of the empire, missionaries used the camera to document the landscapes over which they traversed, the people whom they encountered, and the commodities that they produced. James Ryan suggests that lectures given by missionaries upon their return to England laid the groundwork for the virtual travel narratives that would become a mainstay of geographic education. Indeed, Sunday schools would often include narratives of exploration and evangelization, illustrated by photographic lantern slides, as part of annual Christmastide celebrations. Even as late as 1890, the lantern was inseparable from this religious context. When the Royal Geographical Society wanted to purchase a projector of its own, one of the members objected by calling the lantern a "Sunday School treat."[27]

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[26] Joss Marsh. "Dickensian 'Dissolving Views": The Magic Lantern, Visual Story-Telling, and the Victorian Technological Imagination." *Comparative Critical Studies* 6.3 (2009): 333-346.
[27] Hugh Robert Mill. *The Record of the Royal Geographical Society 1830-1930*. London, 1930, p103. Quoted in *Picturing Empire*, p 193.

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Media scholar Joe Kember describes temperance lantern lectures in the Bill Douglas Cinema Museum Collection.[28]

Late Victorian lantern shows appropriated photography to tell fictional narratives as well. As Joe Kember describes in the video above, temperance societies produced lantern slides and scripts that warned of the perils of alcohol through characters on screen. These lantern shows often included communal hymn singing, solo performances, and choirs. Encouraging the audience to respond to key moments in the narrative through song provided a means for the audience to embody the ideals being represented on screen.

The lantern persisted as a means for educational entertainment long after the advent of film. Indiana University's own collection of magic lantern slides speaks to the enduring popularity of projectors, particularly in educational settings, as a means to supplement lectures with visual material. A photo taken in 1938[29] shows the extent of IU's collection of slides. The advertisement in the center of the photo captures the range of subjects on offer by featuring two men in Japanese dress, and elephant, a windmill, and a mathematical diagram. The debut of Kodak's carousel slide projector in 1961 signaled the end of the magic lantern's long reign within the classroom, for 35mm slides were easier to transport and store. The lantern's contribution to screen culture, particularly in educational settings, is reflected in the distinctly nineteenth-century vocabulary that we use to describe the structure of PowerPoint presentations today. Technology has advanced to the point where we no longer need to manipulate pieces of glass or film to project images as we speak, and yet we refer to the building blocks of our presentation as "slides," an homage to the days of the lantern when pieces of glass slid in and out

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[28] https://youtu.be/PqvIofBsQRU

[29] http://webapp1.dlib.indiana.edu/archivesphotos/results/item.do?itemId=P0030827&searchId=4&searchResultIndex=5

of the projector. Vestiges of the special effects accomplished by mechanical slides and biunial lanterns can be found in transitions and animation effects, including the appear, disappear, fly in, and dissolve. As I will discuss in the next section, missionaries have been recurring features in longstanding conversations about educational technology and the expansion of the British empire. I will suggest that ephemera from the heydey of copperplate printed slides offers a window through which to study the lantern's role in structuring encounters with local and indigenous peoples.

Visualizing Civilization

"Strangers Like Me"

Thanks to the proliferation of photographic lantern material, particularly after 1880, missionaries and their magic lanterns have become recurring features within scholarship on technology, education, and imperialism; their influence has been so pervasive that they have become part of fictional representations of early-twentieth century education as well. The musical number "Strangers Like Me" in Disney's 1999 animated adaptation of *Tarzan* serves as a touchstone for the content and overt colonialism of magic lantern shows.

The clip of the musical number is embedded here.[30]

Although the film is clearly in the realm of fiction, the scene is surprisingly accurate in its portrayal of an Edwardian magic lantern show. The projector is appropriate for the presumed location and period of the film. Its kerosene lamp would have been far more portable than the limelight apparatus favored by lantern lecturers in England and the US, and its wooden body and tin roof are stylized versions of Edwardian mahogany lanterns like this one from the Bill

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[30] https://youtu.be/FAT0KpN9y_Q

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Douglas Cinema Museum.[31] The depiction of the slides is not quite as spot-on, for the eagle-eyed lantern enthusiast would find a couple of minor continuity errors. The accompanying slides are American standard size, slightly wider than their British counterparts— curious for a British expedition. Visually, the transitions between slides mimic the abruptness of the zoetrope, not the sideways slide of the wooden carriers most widely used at the time. These minor errors aside, the content of *Tarzan*'s lantern show follows those given by missionaries sixty years earlier. Reverend Smithurst, who was sent by the Church Missionary Society to Red River, Canada in 1839, imagined giving a similar show to his Cree congregants as part of a Christmastide tea.[32] In a letter to the CMS secretary Daniel Coates, Smithurst requested slides that would create a virtual tour similar to the one in *Tarzan*. Smithurst's show would include marvels of European architecture, the geological pyrotechnics of a volcanic eruption, and technological wonders like the steam packet and the train.[33] He also requested mechanical slides made by Carpenter & Westley that depicted the rotation of the planets around the sun.[34] Though Smithurst did not receive all the slides that he hoped, his wishlist speaks to the ideal lantern show that present "interesting objects which would combine instruction with amusement."[35]

The lantern show in the film exceeds mere entertainment by changing Tarzan's behavior. As a surrogate for "uncivilized" folk, Tarzan represents an idealized audience member who eagerly interacts with the images on screen. The visual juxtaposition between the silver-backed

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[31] http://www.bdcmuseum.org.uk/explore/item/69017/

[32] I offer a more detailed account of Reverend Smithurst's magic lantern shows in "Reverend Smithurst's Wishlist." *The Magic Lantern*. Journal for the Magic Lantern Society of the UK. Fall 2018, p 14.

[33] Reverend Smithurst, Letter to Daniel Coats, Esq. 29 December 1845. CMS/B/OMS/C C1 063/30 p4. Church Missionary Society Archives, University of Birmingham Special Collections.

[34] Reverend Smithurst, Letter to Rev. Henry Venn, 28 November 1850. CMS/B/OMS/C C1 063/65. Church Missionary Society Archives, University of Birmingham Special Collections.

[35] Smithurst describes the lantern show as educational entertainment in his letter to Daniel Coates (29 December 1845, p4). He describes the slides that he received as "wretched daubs." See Reverend Smithurst, Letter to Daniel Coats, Esq. 18 November 1846. CMS/B/OMS/C C1 063 p3. Church Missionary Society Archives, University of Birmingham Special Collections.

gorilla and the athlete creates an equally striking contrast between Tarzan's gestures in response to the images. At first, he approaches the projected image of the silver-backed gorilla as he would a real one, carefully crawling on all fours towards the screen. Upon seeing the mustachioed man, he adopts a dramatically different posture. On the surface, Tarzan's efforts to mimic the European figures on screen register as comic, particularly to Jane and her father, yet the framing of this scene suggests that the lantern show serves a more subversive purpose— to celebrate and reinforce European ideals of masculinity. The larger-than-life proportions of the figure on screen make Tarzan appear small, even though he would likely dwarf the athlete. Furthermore, the waltzing man and woman offer Tarzan a means of interacting with Jane through the protocols of European dance, yet his efforts to these protocols seems outlandish because the graceful waltzers are still in view as he spins Jane around the room. The montage portrays the magic lantern show as the starting point for other engagements with technology, including a telescope, a zoetrope, and a bicycle. *Tarzan* places the magic lantern as the primary conduit through which to introduce and reinforce European cultural ideals due to the lantern's ability to visualize "civilization." The film not only remediates the mechanical affordances of nineteenth-century projection equipment but also represents the colonial overtones inherent in the content of actual slides and the audio-visual presentation of this content in magic lantern shows.[36]

The "Oxyhydrogen Light of Civilization"?

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[36] *Tarzan* is not the only film to represent a magic lantern within an educational setting. In Harry Potter and the *Prisoner of Azkaban*, Professor Snape supplements his lecture on werewolves with projected images. The sequence of cave paintings, ancient Egyptian friezes, Greek vases, Roman mosaics, and Michelangelo-esque sketches parody the art-history lecture. The mechanism that he uses to project these images closely resembles German circular slides, including this example at the Bill Douglas Cinema Museum: http://www.bdcmuseum.org.uk/explore/item/69800/.

While a fictionalized representation of magic lantern shows, *Tarzan* parallels scholarly arguments about Victorian screen culture, missionary activity, and Britain's colonial expansion. The lantern shows of Livingstone and Williams have been discussed briefly in a wide range of critical work, including museum exhibition guides, biographies, histories of photography, and studies of the Victorian missionary movement. Published eyewitness accounts of Victorian magic lantern shows tend to appear as anecdotal evidence to support longstanding critical conversations about missionaries as agents of imperialism. These discussions often center on a phrase attributed to Livingstone, who reputedly referred to his projector as "the oxyhydrogen light of civilization." By offering an editorial history of this phrase, I survey previous scholarship on evangelistic lantern shows, particularly as extensions of Britain's civilizing mission, and expose the need for increased attention to unpublished sources like letters, journals, and diaries within discussions of missionaries and their place in global history.

The phrase "the oxyhydrogen light of civilization" appears in a letter from Livingstone to William Thompson, a missionary who was also working in South Africa. Livingstone wrote the letter upon his return to Linyanti after completing the western leg of his coast-to-coast expedition. Dated September 13th, 1855, it follows the most active period of lantern use. Despite the fact that Livingstone was giving regular lantern shows at this time, the letter does not mention his lantern specifically. Instead, he offers a compliment to Thompson for a recent change in trade policies:

> *Your policy to the Bechuanas and Griquas shews minds enlightened by the*
> *full jet of the oxyhydrogen light of modern civilization.[37]*

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[37] Livingstone, David, 1813-1873. "Letter to William Thompson, 13 September 1855." CWM/LMS/Livingstone Wooden Box, item 88. University of London. School of Oriental and African Studies. Accessed via Livingstone Online. Adrian S. Wisnicki and Megan Ward, dirs. 2019. Web. 20 February 2019. pp 8-9.

In the letter, limelight functions as a metaphor for cultural enlightenment, echoing the ways that lantern shows educated and reformed their audiences. Livingstone's metaphor relies on an intimate knowledge of lantern light sources. Oxyhydrogen light, more commonly known as limelight, required steady streams of oxygen and hydrogen gas. When ignited, they heated a one-inch piece of limestone to the point of incandescence, producing a light source far more luminous than the oil lamp used by Livingstone in his lantern. An unobstructed and steady stream of oxygen and hydrogen (i.e. a full jet) would create the brightest illumination. The implication is that promoting stronger trade with the interior would weaken Portugues slave trading networks.

The additions made by Livingstone himself further complicate our understanding of the letter as an expression of his thoughts on African culture. These changes are visible in the original letter in the School of Oriental and African Studies Special Collections in London and its digital counterpart hosted by *Livingstone Online*.

The website includes an image of the letter.

Livingstone added—and then deleted—what appears to be an "a" before "modern." While it may seem a bit of a stretch to tease meaning out of a deleted "a," the "a" offers one of many moments through which to study Livingstone's careful negotiation of local cultures in light of their increasing economic ties with Britain. Livingstone's editorial decision to add then delete the "a" is consistent with his complex, and often conflicting, views of Africans in his journals, field diaries, and letters. In his introduction to the critical edition of *Livingstone's Manuscripts in South Africa*, Jared MacDonald has foregrounded differences in content and tone between Livingstone's diaries and his letters to British manufacturers, government officials, and missionary society secretaries. He acknowledges that Livingstone's widely-circulated writings

diminish the contributions of Africans to his expedition. In this case, Livingstone's oscillation between "modern civilization," "a modern civilization," and "[deleted a] modern civilization" crystallizes how Livingstone negotiated different attitudes towards local and indigenous cultures. The final turn to "modern civilization" suggests a more paternalistic attitude that there's only one form of modern civilization—the assumption being that it's a British one. But before settling on this view, Livingstone entertains the possibility of a distinctly South African mode of modernization.

Livingstone's stance toward colonial economic policy in this letter resonates with the careful political negotiation of Williams and Crowthers. Livingstone believed that missionaries would be successful only after trade had dramatically shifted cultural views on slavery, and his expression of that sentiment in this letter is consistent with his other writings on the subject. His letter to Thompson uses limelight as a metaphor for a new policy that limited the sale of ammunition, ultimately diverting ivory out of the hands of Arab slave traders and into the hands of English merchants. Williams, too, was deeply aware of competing political powers in his sphere of influence. His vitriolic critique of Catholic missionaries coincides with mounting tensions between various European traders, including the (Catholic) French. Furthermore, the islands that Williams visited had been irrevocably shaped by contact with unscrupulous traders (British included)— like Livingstone's South Africa, the unregulated sale of ammunition to locals had fueled intercultural warfare, not just between Polynesians and Europeans but also among the Polynesians themselves. Samuel Crowther was also deeply attuned to the political upheaval caused by British intervention. His lantern show before King Pepple in Bonny, Nigeria not only reinforced the authority of a king who had been brought to power by the British, but

Crowther also tried to soothe the mounting tensions between sub-factions within the king's kingdom.

Isaac Schapera's edition volume of Livingstone's letters adds essential contextual information, but it masks additions by Schapera and by Livingstone. First, Schapera makes Livingstone's rather oblique reference to economic policy explicit by adding "free trade" in parenthesis. This phrase adds clarity, but it does not appear in the original letter, nor is in included in the quotations of this sentence that persist in critical work on Livingstone. Second, Livingstone's momentary shuttling back and forth between competing conceptions of civilization is eliminated.

> *Your policy to the Bechuanas and Griquas shews minds enlightened by the full jet of the oxyhydrogen light of modern civilization (free trade).*[38]

From here, the phrase often appears uncited in critical approaches to David Livingstone specifically and magic lantern shows more broadly. Manuscripts, like the original "oxyhydrogen light of civilization" letter, offer platforms through which to expand and nuance our understanding of missionaries and their role in Britain's colonization efforts. But the mechanics of print and manuscript materials have obfuscated the origins of the phrase, leading to misquotations in critical work. Previous scholarship has relied heavily on published accounts of missionary efforts, often to the exclusion of contradictory material in unedited and unpublished records. By privileging published narratives of missionary work, scholars reproduce the view of magic lantern shows that missionaries wanted their readership to see. Published accounts often excise moments of miscommunication and misunderstanding, creating a narrative that is overly

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[38] *Livingstone's Missionary Correspondence 1841-1856.* Edited by Isaac Schapera, University of California Press, 1961. p 282.

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celebratory of the missionaries' efforts. This in turn lead to assumptions about the magic lantern as an efficacious educational tool, the reverberations of which can be seen in Disney's *Tarzan*.

Jack Thompson's *Light on Darkness?* (2012), a groundbreaking work on missionary photography, offers the most extensive study of Livingstone's lantern show to date.[39] In his chapter on lantern shows specifically, Thompson observes that magic lantern shows were responsible for disseminating photographic material internationally, particularly as part of the abolitionist movement in England and in the United States. Thompson's inclusion of Livingstone in this book is somewhat curious, for the project as a whole focuses on photographic material produced by missionaries, and Livingstone neither used nor produced photographs. However, "the oxyhydrogen light of civilization" frames Thompson's more extended analysis of the Harris' photographic lantern show "Congo Atrocities" which extended Livingstone's critique of non-British colonial powers in Africa. For Thompson, the lantern functions as the light of civilization in both African and British contexts in the ways that the show calls for social justice and moral reform in response to the figures on screen. Given the extensive archive that Thompson draws from to discuss the visual and aural content of the Harris' show, it is surprising that he does not cite Livingstone's letters, journals, or published work. Instead, he references two other historians, Steve Humphries and Donald Simpson, and notes that "the oxyhydrogen light of civilization" is left uncited in these texts.[40] Due to this uncertainty, Thompson removed the phrase from his later critical work on Livingstone's lantern.[41]

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[39] T. Jack Thompson. *Light on Darkness?: Missionary Photography of Africa in the Nineteenth and Early Twentieth Centuries*. Eerdmans, 2012. Studies in the History of Christian Missions.

[40] Steve Humphries. *Victorian Britain Through the Magic Lantern*. Sidgwick & Jackson Ltd, 1989. and "Missions and the Magic Lantern." *International Bulletin of Mission Research*. January 1, 1997. pp. 13-15.

[41] "David Livingstone's Magic Lantern, United Kingdom." *Trophies, Relics, and Curios? Missionary Heritage from Africa and the Pacific*. Edited by Karen Jacobs, Chantal Knowles, and Chris Wingfield. Sidestone Press, 2015. pp 95-97.

Unlike Thompson, other scholars have marshalled this phrase without acknowledging that the source is unknown, and in doing so, interpret it as an expression of Livingstone's stance toward the use of magic lanterns for educational purposes. *David Livingstone and the Victorian Visual Encounter with Africa*, the 1996 exhibition at the Scottish National Portrait Gallery, not only displayed the lantern among other relics of Livingstone's consular days, but also included the phrase in the exhibition's accompanying book.[42] Quite notably, this portion of the text was written by Tim Jeal, whose monolithic biography *Livingstone* was among the first to challenge the Victorian tendency to lionize missionary work.[43] In both his biography and his piece for the exhibition, Jeal's approach to Livingstone's expeditions foregrounds the explorer's flaws. When read in this light, Livingstone's positioning of the lantern as the "oxyhydrogen light of civilization" registers as propaganda, an overly-celebratory portrayal of his evangelistic efforts and his unflagging commitment to colonialism. Similarly, James R. Ryan points to Livingstone as a forerunner of the kinds of educational lantern shows produced by the Colonial Office Visual Instruction Committee (COVIC) following its formation in 1902.[44] The phrase serves as useful shorthand for the overt colonialism in the photographic material and lantern lecture scripts circulated by COVIC. Likewise, Ann C. Colley gestures to Livingstone in her brief assessment of Williams' lantern shows. For her, this phrase anchors the use of the lantern in the South Pacific as part of global trends in missionary magic lantern shows. Colley then compares the overt colonial overtones of these earlier shows to the ones given by Stevenson and his colleagues while traveling in the South Pacific in 1889.[45]

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[42] John M. MacKenzie, ed. *David Livingstone and the Victorian Encounter with Africa*. London: National Portrait Gallery, 1996.

[43] Tim Jeal. *Livingstone: Revised and Expanded Edition*. Yale University Press, 2013.

[44] James Ryan. *Picturing Empire: Photography and the visualization of the British Empire*. University of Chicago Press, 1997.

[45] Ann C. Colley. *Robert Louis Stevenson and the Colonial Imagination*. Ashgate, 2004.

Seeing the lantern through as a "civilizing" influence coincides neatly with broader trends in colonial historiography. That is to say, cultural historians and literary critics have often interpreted missionaries as agents of imperial expansion due to the frequent conflation of conversion to Christianity and industrialization within nineteenth-century evangelical rhetoric. Catherine Hall and Susan Thorne, for example, describe how missionaries contributed to racialized and paternalistic views of colonized subjects through the periodical press. They argue that accounts of missionary work offered virtual encounters with exotic "Others" who inhabited the periphery of the empire, ultimately reshaping English working class identity.[46] Such an approach is consistent with the critiques offered by Jeal and Ryan of missionary activity. When taken at face value, I agree that characterizing the lantern as "the oxyhydrogen light of civilization" would explicitly implicate it within Britain's civilizing mission. To exhibit the lantern was not only to display instructional material but to offer visual regimes for the reification of British ideals, morality, and systems of production. Thus, magic lantern shows must be placed inside a constellation of governmental, economic, and religious systems designed to expand Britain's imperial power.

While Thompson, Ryan, Jeal, Humphries, and Colley are justified in associating the lantern with Britain's "civilizing mission," the connection between the two does not necessarily stem from the representation of a projector in text. Instead, the lantern's mechanical history and the use of limelight as a metaphor provides a more robust framework for situating the lantern show within Britain's colonization efforts. Limelight's origins as a surveyor's tool implicate the lantern as a means of cultural regulation. First deployed by Thomas Drummond to survey Ireland

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[46] Catherine Hall. *Civilising Subjects: Metropole and Colony in the English Imagination 1830-1867*. University of Chicago Press, 2002. and Susan Thorne. *Congregational Missions and the Making of an Imperial Culture in Nineteenth-Century England*. Stanford University Press, 1999.

in 1826, limelight facilitated tax collection through accurate maps of land-holdings, ultimately reinforcing British imperial authority. Livingstone implies that increasing trade with the British will help modernize the Africans in closest proximity to colonial outposts. More importantly, locating the original source for this phrase reveals broader challenges of studying nineteenth-century missionaries. The citation practices of previous scholars reflects the limitations of working primarily with physical sources, including the original copies of Livingstone's writings and edited volumes of this material. Tracking down the origins of "the oxyhydrogen light of civilization" through print and manuscript sources is nearly impossible without a fully searchable copy of Livingstone's correspondence, journals, and diaries, which is perhaps why the phrase has remained uncited for so long. The relatively recent digitization of manuscript material by Livingstone Online and of edited volumes by Google Books has expedited this process. The original letter in its manuscript, edited-for-print, and digital forms not only illuminates Livingstone's editorial practice but also radically shifts interpretations of Livingstone and his stance towards Africans, especially those who witnessed his lantern shows. In this revisionary work, digital access to this material demonstrates the need for increased attention to physical artifacts, including manuscripts and magic lanterns, as windows through which to study nineteenth-century history.

Media Archaeology

This dissertation reframes conversations about the screen's technological history through its method as well as its content. Previous scholarship within film studies, which I will describe below, has used the term "archaeology" as a framework for exploring the material history of projection and the moving image. Over time, the scale of these "archaeologies of the cinema" has expanded from technologies that pre-date film to "archaeologies of the screen" that discuss

the most recent developments in virtual reality and web-based screen experiences.[47] Paper-based technologies, including letters, advertisements, catalogs, and periodical literature, have played a supporting role in these histories by serving as records of the magic lantern's manufacture, circulation, and use in lantern shows. This dissertation not only introduces new material into archaeologies of the screen but also develops a new method for approaching the mechanisms that have been foundational for these conversations. This dissertation performs what I characterize as an "archaeology of mediation" that focuses on magic lantern shows given by missionaries. I draw on conceptions of mediation as a function of form and as an embodied practice. In doing so, I argue that lanterns, slides, paper, and webpages are best understood as the material expression of embodied cultural practices. As an archaeology, the dissertation excavates the layers of mediation that accrue when nineteenth-century magic lantern shows are represented through projection equipment, letters, published accounts, and webpages. Excavating moments of mediation through materialities acknowledges the presence of local and indigenous people in magic lantern shows, thereby foregrounding the contributions they made to nineteenth-century screen experiences.

Archaeologies of the Screen

Tracing the evolution of "archaeology" in film and media studies exposes the critical context of my approach to magic lantern shows, particularly my interest in lanterns, slides, and documents as historical records. Below, I describe key moments in conversations about the mechanisms which generate the screen experience. From its inception as a field, film studies has devoted significant attention to the material history of the moving image. Franz Paul Liesegang

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[47] Although screen media are predominantly visual, I use the term "screen experience" to refer to the embodied practices of viewing. "Experience" also de-privileges the visual in order to include sound and touch as part of the audience's interaction with the material on screen.

pioneered this vein of scholarship; born in 1873, Liesegang witnessed first-hand the radical

changes to the entertainment industry precipitated by Thomas Edison's vitascope. Perhaps

Liesegang's personal encounters with a range of moving image technologies in his childhood

prompted him to look beyond the screen for cinema's mechanical antecedents. In his landmark

study *Zahlen und Quellen: zur Geschichte der Projektionskunst und Kinematographie* (1926),

Liesegang offered a narrative of technological evolution through convergence.[48] He grouped

cinema's forerunners into three families of apparati: the magic lantern, the phenakistoscope, and

the photographic camera. Categorizing pre-cinema technologies in this manner enabled

Liesegang to describe how each device solved a mechanical problem. The magic lantern refined

image projection; optical toys like the phenakistoscope and zoetrope simulated movement

through rapid transitions between a sequence of stills; and the camera captured images through

photographic processes.[49]

Liesegang's approach to film history was adopted and expanded by subsequent histories

of the moving image, most notably C.W. Ceram *Archaeology of the Cinema* (1965) and Laurent

Manonni's *The Great Art of Light and Shadow: Archaeology of the Cinema* (French: 1994,

English: 2000). Both Ceram and Mannoni appropriate the object-oriented nature of

"archaeology" as a method to describe their focus on the mechanisms which created moving

images. Where Liesegang, Ceram, and Manoni differ is the centrality of photography in their

respective archaeologies. Ceram characterizes early cameras, stroboscopic optical toys, and

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[48] Liesegang's work was translated into English by Hermann Hecht in 1986 and published as *Dates and Sources: A Contribution to the History of the Art of Projection and to Cinematography* by the Magic Lantern Society of Great Britain.

[49] Following Liesegang's model, Rudolph Thun framed his archaeology of the cinema around six technological innovations in his work *Entwicklung der Kinotechnik* (Berlin, 1936). Subsequent histories, including Georges Sadour's *Histoire générale du cinéma*, volume 1 (Paris, 1948) and Friedrich Pruss von Zglinicki's *Der Weg des Films* (Berlin, 1956), also offer comprehensive surveys of magic lanterns, phenakistoscopes, and zoetropes as well as shadow European and Asian shadow puppet theatre.

magic lanterns as "serious" forerunners of film due to their mechanical similarities with film cameras and projectors; he dismisses magic lantern slides as "dubious" ancestors because they "did not show genuine motion, but merely 'change of position' (18). Responses to Ceram have tended to take two forms: the first critiqued Ceram's narrow focus on photographic and cinematic equipment. The second built modes of analysis that use the apparati responsible for creating the screen experience as the primary node through which to study the cultural context of film. This dissertation draws from both of these directions in scholarship to expand the scope of media archaeology.

Archaeologies like Manoni's responded to Ceram's relegation of the lantern to the sidelines by shifting from "cinema" as the primary area of focus to visual phenomena supported by a range of technologies. Manoni used the framework of the "great art of light and shadow" to reinscribe the lantern within film's pre-history. He gave mechanical magic lantern slides pride of place by describing their use in phantasmagoria and their appearance as dissolving views. More recent studies, including *Multimedia Histories: From the Magic Lantern to the Internet* (2007) and several essays by Erki Huitomno, reframed media archaeology by focusing on technologies of the screen.[50] Scholarship in this vein traces the evolution of the screen from its canvas roots in pictorial art, dioramas, and panoramas; to its role in the magic lantern show as a passive receptacle of projected image; to the computer monitor as an interactive interface. Like the most

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[50] Huhtamo's first reframes cinema studies in "Elements of Screenology: Toward an Archaeology of the Screen," *ICONICS: International Studies of the Modern Image* 7 (2004): 31-82. He develops his approach to screen technology in "Screen Tests: Why Do We Need an Archaeology of the Screen?" *Cinema Journal*, 51:2 (2012): 144–148. and, most recently, in "The Four Practices?: Challenges for an Archaeology of the Screen." *Screens*, edited by Dominique Chateau and José Moure, Amsterdam University Press, Amsterdam, 2016, pp. 116–124. Siegfried Zielinski's *Deep Time of the Media: Toward an Archaeology of Hearing and Seeing by Technical Means* (MIT: 2006) offers an equally expansive accounts of media from cave painting to the internet. Shifting away from the continuum model, Jussi Parikka's *What is Media Archaeology?* (London, Polity Press, 2012) examines moments of profound technological change, including the development of sound in film, the debut of television, and the expansion of the internet.

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recent turn in studies of the screen, I place the lantern on a continuum of technologies that produce screen experiences like the one you are experiencing now. And like the scholars mentioned above, I draw from prose and illustrations contained within nineteenth-century textual sources to support my analysis of improved phantasmagoria lanterns and their accompanying copper-plate printed slides. The dissertation's digital form not only makes it possible to represent lanterns and slides in a visually-oriented format, but the website also opens up fruitful comparisons between the nineteenth-century magic lantern show and digital remediation of ephemera in a web-based environment as screen experiences. In particular, I am interested in exploring the ways that screen technologies in their Victorian and current form facilitate embodied interactions with the material represented on screen.

This interest in screen-viewing practices resonates with a second vein of scholarship that responds to Ceram, whose object-oriented approach to the screen's history sparked the rise of apparatus theory within film studies. While not explicitly archaeologies of the cinema or the screen, they share Ceram's interest in the mechanical apparti. Jean-Louis Baudry's seminal essays, "Ideological Effects of the Basic Cinematic Apparatus" (1970) and "The Apparatus: Metapsychological Approaches to the Impression of Reality in Cinema" (1975), drew heavily from Freudian psychoanalysis to examine the ways that moving image technologies disseminate and reinforce cultural ideals through the embodied practices of film viewing. For Baudry, screen technologies promote a *voyeuristic* mode of viewing that is not only structured by the viewing space but also by formal cinematic features like editing and sound. Like the Foucauldian panopticon, these embodied viewing practices reinforced cultural narratives about power and normativity through an act of the surveillance of the part of the viewer. Baudry and his interlocutors, particularly Jean-Luis Comolli, Christian Metz, and Laura Mulvey, privilege the

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audio-visual content of films within in their analyses. These semiotic approaches to film implicate larger cultural forces in the act of film viewing, but they lack historical or geographic specificity.

Toward an Archaeology of Mediation

Apparatus theory's interest in viewing practices opens up a space for screen history to perform cultural history. Such an approach would use the materials of screen archaeology to excavate the screen experience as a site for the dissemination of cultural ideals within specific contexts. When read in this light, eyewitness account in letters and published missionary narratives not only document the mechanical development of screen technology but also portray these technologies in action. In this section, I draw from media studies, anthropology, and ethnography to develop a mode of reading textual sources as representations of audio-visual experiences. Specifically, theories of mediation help me to identify the forces that shaped the production of the materials that I will study in this dissertation.

As texts, eyewitness accounts remediate the magic lantern show in a formal sense. Bolter and Grusin characterize remediation as the presence of medium in another.[51] Missionaries evoke the visuality and aurality of the screen experience by describing images and spoken narration; in this way, the letter structurally mimics the magic lantern show by presenting a series of narrated vignettes. For example, John Williams' account of his lantern show, which I analyze in greater detail here, takes this formal remediation one step further by preserving the technological affordances of Carpenter and Westley's sliders. Williams describes a sequence of three images: the Nativity, Jesus' presentation at the temple, and the Holy Family's flight to Egypt. This detail

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[51] Jay David Bolter and Richard Grusin. *Remediation: Understanding New Media*. MIT Press, 1999.

not only captures the content of his lantern shows but also reflects the fact that the <u>scriptural sliders</u> had three images embedded in a single wooden frame. Williams' letter does not offer a complete account of the sequence of images that he presented. This omission foregrounds the ways that even the most precise and robust first-hand account can overlook elements of the magic lantern show. By translating a multi-sensory experience into a textual form, the myriad attractions of the magic lantern show as a performance medium are inevitably—and irrevocably— lost.

Theories of mediation from anthropology and ethnography suggest that these omissions are not simply the result of translating one medium into another. Instead, these gaps reveal the limited perspective of the author. As cultural critic Fredric Jameson has argued, works of art (and by extension, pieces of performance art) are 'mediated' in that they are viewed through a matrix which includes the viewer's personal experience and cultural context (1981, 39). Eyewitness accounts ossify the author's own biases and interests, making it impossible to fully extricate the author's perspective from the sequence of events described in the text. In this way, the letter becomes a record of a moment of mediation that occurred during the magic lantern show. More recent studies by William Mazzarella, Webb Keane, and Arjun Appadurai have expanded Jameson's approach to describe mediation as a set of embodied practices that express cultural ideals in material forms.[52] Appadurai's essay "Mediants, Materiality, Normativity" is worth discussing at length because it offers the most robust framework through which to approach the

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[52] See William Mazzarella. "Culture, Globalization, Mediation." Annual Review of Anthropology, vol. 33, 2004, pp. 345–367. JSTOR, www.jstor.org/stable/25064857. And Webb Keane. *Christian Moderns: Freedom & Fetish in the Mission Encounter*. University of California Press, 2007.

interconnectedness of mediation, materiality, and the forces that shape both.[53] For Appadurai, mediation and materiality

> *cannot be usefully defined except in relationship to each other. Mediation, as an operation or embodied practice, produces materiality as the effect of its operations. Materiality is the site of what mediation — as an embodied practice — reveals (224).*

Materiality implies physicality, but Appadurai uses this term more expansively, i.e. speech can serve as materiality. Appadurai's conception of mediation as an embodied act parallels Diana Taylor's characterization of repertoire, or moments of performance, as the embodiment of the archive, the physical materials that both inform and record those moments.[54] However, Appardurai's model accounts for a greater range of contributors to mediation as a process, whom he refers to as "mediants."[55]

Although Appadurai discusses mediants, mediation, and materiality in relation to Bollywood films' representation of slum life and the screening of those films in Mumbai, this context resonates with cultural dynamics at play in nineteenth-century magic lantern shows. Offering an extended comparison between these two contexts fleshes out the anthropological approach to mediation that I will adopt in the chapters to follow. Appardurai's first move is to triangulate the relationship between film, religion, and setting. Mediation as a framework

> *tells us that Bollywood films are a technology of religion, if we agree to see religion as primarily a form of mediation between the visible and the invisible orders, in this case the invisible order of family, kinship, territory, and belonging that can be found only in the visible order of housing, however insecure, unstable, and temporary such housing might be.*

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[53] Arjun Appadurai. "Mediants, Materiality, Normativity". *Public Culture* 1 May 2015; 27 (2 (76)): 221–237. DOI: 10.1215/08992363-2841832

[54] Diana Taylor. *The Archive and the Repertoire: Performing Cultural Memory in the Americas*. Duke University Press, 2003.

[55] Appadurai sees "mediant" as a subcategory of what Bruno Latour's refers to as "actants" within actor-network theory. Latour, Bruno. *Reassembling the Social: An Introduction to Actor-Network-Theory*. Oxford University Press, 2005.

To apply Appadurai's framework to a nineteenth-century context, the magic lantern can be read as a technology of religion in a very literal sense in that it introduced the main tenets of Christianity in audiences in Africa and the South Pacific. As I will demonstrate in the chapters to follow, visual content and spoken narration portrayed Christ as the Messiah, the fulfilment of Old Testament prophecy. In this way, the screen experience became a moment of formal mediation in that it translated textual sources into an audio-visual format. Simultaneously, the magic lantern becomes a vehicle for mediation in Appadurai's conception of the term, for it is situated between Christianity as a religious practice and the expression of those practices in the visible world. The magic lantern not only functioned as a technology of religion but also a technology of empire. In addition to its role in the magic lantern show, the projector itself functioned as novelty item due to its scarcity in Africa and the South Pacific. The lantern conveyed the invisible orders of British trade practices and political authority alongside other trade goods and technological wonders brought by the missionaries.[56] Thus, the lantern showcased the technological sophistication of an object produced in Britain and—as a corollary—suggested the commercial potential of joining British trade networks. The lantern as the apparatus and as a novelty item projected a vision of stability onto spaces made unstable by the arrival of British missionaries and other agents of colonialism. Missionaries often crossed paths with people who would not be considered indigenous to the regions in which Europeans encountered them.[57] For this reason, audiences of magic lantern shows are most accurately described as "local" rather than "indigenous."

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[56] Technological novelties included watches, photographs, and static electricity generators. David Livingstone writes in *Missionary Travels* that "It was pleasant to see great numbers of men, women, and buys come, without suspicion, to look at the books, watch, looking glass, revolver, etc" (623-4).

[57] For example, Livingstone's first expedition was backed by the Kololo who had been pushed out of South Africa during the Mfecane, a period of warfare sparked by Shaka Zulu's expansion of the Zulu Kingdom. The Kololo were part of the Sotho trapped between Shaka Zulu, the British, and the Boers. Rather than remain in South Africa, the

Appadurai's model accounts for local audiences in moments of mediation. In the case of

Bollywood films, this framework also

> *allows us to see films and film viewing as a vital part of Mumbai's infrastructure, which allows ordinary, often poor, citizens to communicate and contest messages about the power, wealth, security, and transportation that flow all around them and that often seem impossible for them to share in, in a just manner.*

Appadurai's distinction between films and film viewing separates the representation of Mumbai

in film and the embodied experience of seeing and hearing that representation in the movie

theatre. For the local audiences of these films, the geographic distance between the spaces they

negotiate on a daily basis and the setting of the events on screen is minimal. Before the

widespread use of photography, it would have been difficult for missionaries to have offered an

on-screen representation of the local settings in which they gave their lantern shows.

Manufacturers in England dominated the slide-making market, meaning that they had little to no

contact with lantern audiences abroad. Even though local audiences were geographically

removed from the world represented on-screen and the slide-making process, the lantern show as

a screen experience functioned as a vehicle for audiences to communicate and contest messages

about faith, political power, and wealth being taught by missionaries, often in ways that the

missionaries did not anticipate. Far from being a one-way transmission of religious thought,

magic lantern shows created opportunities for the audience to respond. Missionaries' letters

capture moments of these responses, ranging from loud sobbing to lavish displays of wealth to

raucous joke-telling. While no project can fully recover local perspectives and voices through the

textual and material archive, reading audiences of magic lantern shows as "mediants" gives non-

Europeans agency in moments of mediation facilitated by the lantern. In doing so, this

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Kololo headed north under the leadership of Sebetwane, whom David Livingstone met in 1851 in what's now southwestern Zambia.

dissertation challenges the Eurocentrisim of previous screen histories by recovering the contributions of local audiences to nineteenth-century screen experiences.

Combining an archaeology of the screen with formal and anthropological models of mediation results in what I characterize as an "archaeology of mediation." Within this framework, projection equipment, paper, and webpages serve a double function. First, they shape the embodied practices of mediation through their technological affordances. If we were to examine this website as a site of mediation, for example, we have to take into account the ways that HTML, CSS, and Javascript shaped the writing process. Anecdotally, as someone who has written content for a document-based dissertation and then heavily revised that content for a web-based environment, the dissertation's web-based form dramatically changed my writing process. Far from being a purely mechanical exercise, designing the dissertation with the mechanical possibilities and limitations of Scalar in mind generated new avenues for critical inquiry. Because I was thinking about visual layout and navigation as I was writing content, I began to ask questions about role of form in the nineteenth-century material that I was studying. This evolution is represented through the iterations of the dissertation as it moved from document to web-based form as well as in my documentation of this process in the chapter on the dissertation's form.

This brings us to the second role of technology in mediation— these devices are the mechanisms which capture the embodied process of mediation as materialities. For both Appadurai's approach to Bollywood films and my own analysis of magic lantern shows, materiality is not necessarily equivalent to physicality. Rather, materiality serves as a more general term to describe the products of mediation and the loci in which mediation takes place. Technologies of mediation record moments of mediation with a variety of recording mechanisms

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and with varying degrees of automation. Some technologies enable moments of mediation while leaving little physical evidence that an act of mediation has taken place. The soot left by oil lamps and limelight is often the only physical record that we have of the slide's role in a magic lantern show. Without supporting material like a program with a listing of the show's content, an eyewitness account, or notes in the lanternist's hand, it is difficult to pin slides to specific performances. In this way, the slide functions as a passive recording device that captures little information about the contexts in which it was used. Others technologies are designed to record through direct physical interaction. Carpenter and Westley's scriptural sliders, for example, use both tactile and chemical processes to etch mediation into materiality; their copperplate-printed outlines represent a mechanically reproduced image while brush-strokes betray the presence of the artist's hand. Still other technologies are designed to automatically record without direct intervention. Scalar tracks changes to webpages over time by saving versions of each page as they are edited.[58] The material expression of meditation—slides, letters, published accounts, this website— reflects the affordances of those mechanical processes.

As an extension of Appadurai's approach, I take into account are the layers of mediation that accrue when magic lantern shows are represented in letters, published versions of those letters, and in digital versions of these texts. Each layer reflects the technological affordances of the layer underneath. The sliders that Williams used in his lantern show functioned as a technology of mediation in the ways that they brought the invisible order of Christianity into the visible world. Because each slide contained a series of three or four images, those images had to be projected in the order that they appear within the wooden frame. Williams letter to his son,

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[58] The number of versions is visible in the footer of each webpage. However, this number does not reflect the true number of iterations since I do the bulk of my drafting in Googledocs, which has its own automated version management system.

which describes his lantern show in detail, preserves the sequence of these images. In this way, the letter formally remediates the visual content of the magic lantern show through its narrative structure. At the same time, the letter captures Williams mediating the magic lantern show and its context through the embodied process of writing. The network of mediants who were part of the lantern show are represented in textual form, but their presence is mediated through Williams' perspective, the technological affordances of writing apparati, and the literary conventions of letters as a genre of writing. As the letter's recipient, Williams' son become part of the network of mediants who shape and respond to the embodied act of mediation that occured in the letter's composition. The appearance of this letter in Williams' posthumous biography represents yet another layer of mediation, this time on the part of the editor. Here, the editor chooses portions of Williams letter to include and omit based on his perspective, the affordances of print, and the narrative conventions of Victorian biographies. At this stage, the number of mediants expands exponentially to include the nineteenth-century readers of the biography and the twentieth- and twenty-first-century scholars who analyze the published text. Finally, the website serves as the materiality of my own mediation of nineteenth-century slides, Williams' letter, and its appearance in print. It is inflected by my training as a Victorianist and digital humanist; it is a product of many mediants, including my committee, mentors, colleagues, archivists, collectors, magic lanternists, technologists, and playwrights as well as the mediants who shaped the production of the material that I study. The website takes the affordances of Scalar and websites more generally into account while also following the literary conventions of a document-based dissertation.

As the examples above suggest, my approach to magic lantern shows goes one step beyond the models developed by Bolter, Grusin, and Appadurai by taking into account the way

that genre shapes embodied acts of mediation. With regards to Victorian travel literature, the affordances of genre are most clearly seen when authors use the same technology of mediation to represent their embodied experience of a place, but the materialities of that embodied act are shaped by the affordances of different genres. Literary critic Justin Livingstone has examined this dynamic at work in the publications of David Livingstone's contemporaries who represented their experiences of Africa through travelogues and adventure fiction, which Justin Livingstone describes as the "fiction of exploration":

> *In fiction, explorers not only found a means of mediating the practical considerations of African transit to would-be discoverers, but a narrative mode by which they could revisit, reimagine and mythologize exploration (3).*[59]

Henry Morton Stanley's *My Kalulu* and *How I Found Livingstone* share the same technology of mediation—the book—, but the travelogue and the fiction of exploration as genres of writing offer different narrative possibilities through which to mediate their experience of Africa. To apply this model to missionaries, I demonstrate in the chapters to follow that differences between the published and unpublished descriptions of magic lantern shows are not simply the products of different technologies of mediation. Rather, I argue that these editorial changes also reveal the effect of genre on acts of mediation.

So then, to perform an archaeology of mediation is to excavate layers of mediation through an analysis of materialities. In the chapters to follow, I examine lanterns, slides, letters, published accounts, and their digital counterparts as platforms for and records of embodied acts of mediation. This mode of interpretation undertakes three tasks. First, an archaeology of

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[59] Justin D. Livingstone. "Travels in Fiction: Baker, Stanley, Cameron and the Adventure of African Exploration", *Journal of Victorian Culture*, (August 2017) DOI: 10.1080/13555502.2017.1356586. Livingstone discusses Stanely's fiction in greater detail in "A romance of slavery: exploration, encounters and cartographies of violence in H. M. Stanley's *My Kalulu*", *Studies in Travel Writing*, 21:4, (August 2017) 349-368, DOI: 10.1080/13645145.2017.1406904

mediation recognizes mediation as an embodied act. Second, it accounts for the ways that the affordances of technologies and the constraints of literary genres shaped the expression of mediation through materiality. Third, it identifies the mediants who participated in this process.

Stratigraphy as Structure

The dissertation's turn towards an "archaeology of mediation" structures the website's content along two axes. The first reflects the strata of mediating technologies that remediate the nineteenth-century magic lantern show. These span from the apparati used to create screen experiences, to field authored documents that represent the cultural context of these events, to publications as means to circulate narratives of missionary travel, to digital remediations of this material. As in archaeology, this stratigraphy does not compartmentalize each layer but takes into account they ways that they overlap and intertwine. The second axis is oriented toward four missionaries who offer the most detailed eye-witness accounts of lantern shows on the fringes of the empire before the advent of photography: John Williams, David Livingstone, Samuel Crowther and his son Dandeson.

Case Studies as Core Samples

This dissertation's primary narrative offers a series of case studies organized around Williams, Livingstone, and the Crowthers. This path through the material resembles a core sample by surveying the layers of technologies that mediate their magic lantern shows. As major figures within the missionary movement, they offer touchstones for the shifting priorities of the London Missionary Society and the Church Missionary Society over the course of the nineteenth-century from evangelization inspired by British exploration of the South Pacific, to a

conflation of missionary activity and geographic exploration, to the support of local church leaders and "native" missionaries. Throughout the nineteenth-century, global and local networks played a significant role in shaping the trajectory of missionary activity. John Williams' lantern and sliders materialize the importance of local social networks in sustaining early missionary work in the South Pacific. Livingstone's letters foreground the role Africans played in the extension of British trade networks. The Crowthers' efforts to develop non-European (or "native") church leadership relied on networks of donors created through the periodical press. However, editors downplayed the contributions of "native" missionaries to the lantern's global history by excising portions of their letters.

The dissertation's final chapter considers my own act of mediation in writing, designing, and building this website. Since the point-of-view preserved by the material archive is a European one, the representation of these artifacts risks reinforcing white narratives about Victorian colonial encounters. This problem is further compounded by the fact that current screen technologies inherited the visual vocabulary of the magic lantern show, particularly those given by Victorian missionaries. Thus, historically-inclined projects like mine must be doubly careful not to minimize non-European perspectives in their content or in their form. By thinking of digitization as a process, not just an aggregation of digital products, I practice a mode of digital scholarship that recognizes and celebrates the nineteenth-, twentieth-, and twenty-first-century mediants who informed this project.

Layers in Focus

This dissertation offers a comparative study of mediating technologies through three additional paths. Each path focuses on a layer in this archaeology of mediation, thereby placing that

technology in three different contents. Click the title to explore the path. (If you wish to continue following the dissertation's main path, use the blue button at the bottom of the page to navigate to the next page.)

Technologies of the Magic Lantern Show

Within studies of the nineteenth-century missionary movement, the magic lantern has been described as a tool that reinforced the main tenets of Christianity while also functioning as a potent visual symbol of the benefits of increased trade. This perception of the lantern assumes that audio-visual modes of communication amplified calls for conversion and industrialization. While this may have been missionaries' explicit goal, I argue that projected images more often than not undermined their evangelistic and economic endeavors. By pairing details of their shows with extant examples of slides, I demonstrate how the mechanical affordances of projection apparati contributed to moments of misrepresentation, miscommunication, and misunderstanding. The lantern shows of Williams, Livingstone, and Crowthers contained moments of implied violence. For Williams, the apparent materialization of Christ in the moment of his death elided the boundary between the space represented on screen and the world inhabited by the audience, ultimately undermining the Protestant theology driving Williams' missionary work. In Livingstone's lantern shows, the image of Abraham sacrificing Isaac aligned with this theological views, but the Lunda members of the audience perceived this projected image as a physical threat because their geopolitical borders had been destabilized by the warfare and mass migration in South Africa. This threat jeopardized the formation of a new trade network proposed by the Kololo, Livingstone's African sponsors. Dandeson Crowther's lantern show relied on comedic violence as a form of humor. The mechanical slide of a butcher's head

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swapping with a boar's decapitated the figure on screen in order to make a visual pun in English. The humor of this slide was lost on their audience who spoke mainly Igbo and Bonny. This created an opportunity for a local cannibal to provide an alternate narrative for the slide by stating that it offered a moral for the audience should follow, thereby reinforcing local African forms of spirituality rather than Christian ones. Reconstructing these moments through digital tools required both object-oriented and experience-oriented practices of digital remediation.

Field-Authored Documents

As a secondary sites of mediation, field-authored documents like letters, journals, and diaries serve a double function in that they record details about the magic lantern show as well as information about the show's local context. The appearance of lanterns and slides in these letters creates a textual space for representations of the audience. By foregrounding the presence of non-European perspectives in these materialities, I argue that lantern show audiences are best understood as microcosms of complex, local cultural landscapes. I demonstrate that missionaries leveraged the novelty of the lantern to increase local support for their missionary efforts. Though Williams' lantern shows did not result in professions of faith, the fact that there were Samoan catechists who could describe the content of the show in detail forty years later suggests that his lantern lectures on Samoa contributed to the sustained growth of the local Christian community. For Livingstone, partnerships with local African groups (many of whom would not be considered indigenous to the part of Africa which they inhabited) were grounded in mutual trade interests rather than in shared beliefs. The Ishinde's performances of power and his expensive gifts to Livingstone reveal that the lantern show was part of a Kololo diplomatic mission to strengthen trade partnerships along the Barotse floodplain. The Crowthers' characterization of the lantern

show as a leisure activity created opportunities for them to monetize the lantern's popularity in order to support building new churches. Their correspondence with well-placed members in the Church Missionary Society contributed to the development of a new publication that supported "native" pastors through funds and donations of equipment (including lantern apparati). Locating these letters and field-authored documents in the archive relied heavily on digital remediations of this material.

Publications

Published accounts of lantern shows in missionary society periodicals, expedition narratives, and biographies sheds light on the global circulation of narratives describing missionary efforts. By foregrounding the omissions and changes made by editors to field-authored material in preparation for print, I argue that the periodical played a central role in establishing the lantern's reputation as an educational tool. In this endeavor, editors tended to adopt two strategies. The first was to elide moments of miscommunication or misunderstanding, including Williams' assertion that the projected image was "just a representation" and Livingstone's frustrated attempts to shout of particularly talkative crowds in Kololo and Lozi villages. Publsihed versions of the Crowthers' lantern shows not only excluded the cannibal's joke, but editorial changes aligned their lantern shows with Sunday School treats in Britain. This tactic infantilized the Crowthers' adult African audiences in order to reinforce European missionary narratives about the need for white ecclesiastical and political leadership in Nigeria. Simultaneously, changes to the Crowthers' letters were designed to appeal to British children as a means to encourage continued fundraising efforts. Digitally remediating and publishing these sources in a web-based environment engages in a project of recovery in order to foreground the contributions of non-

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European missionaries and audiences to early screen culture. In doing so, I imagine ethical

futures for continued scholarly conversations through the dissertation's web-based form.

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Chapter Abstracts

On the website, these chapter descriptions followed an expanded dissertation abstract. They offer an overview of the chapters as core samples.

As an archaeology of mediation, this dissertation is structured as a stratigraphy; each chapter excavates a layer of material surrounding a technology of mediation, spanning from the technologies at the heart of the lantern show to letters to print to web sites. In doing so, I explore how each technology contributes to our understanding of significant figures within the nineteenth-century missionary movement.

The first case study analyzes a sequence of copperplate-printed slides described by John Williams in a letter to his son. Using Ludwig Vogl-Bienek's concept of "presence" as a framework, I argue that the absence of scenery in projected images minimized distinctions between the space represented on screen and the space inhabited by the audience. When Williams projected an image of Christ on the cross to an audience in Samoa in 1839, he reported that "their feelings were overcome, and they gave vent to them in tears." In its original form, the letter suggests that Williams felt uncomfortable deploying technology to elicit emotional responses. During the lantern show, Williams tried to reassert the boundary between the audience and Christ by explaining that the projected image "was only a representation." Published accounts of Williams's lantern show elided his insistence on the immateriality of the image of Christ crucified in order to celebrate his efforts to evangelize with the aid of technology.

This published account would inspire three of the Victorian period's most celebrated missionaries to bring lanterns with them on their expeditions. David Livingstone, the subject of

my second case study, accidentally frightened his audience with an image of Abraham about to sacrifice Isaac in 1852. Livingstone's writings offer more details about his African audiences than the content of his lantern shows. A closer examination of his field diary reveals a dramatic shift in African reactions to the lantern, moving from reciprocal acts of storytelling to formal, courtly encounters to tense refusals to see the lantern show. The dramatic change in tone corresponds with the most politically-charged leg of his first expedition. As a Nduna of the Kololo, Livingstone represented the trade interests of both Britain and African empires. Reactions to Livingstone and his lantern not only reflect African attitudes towards British colonization, but also towards the Kololo who had provided men and provisions for Livingstone's journey. Instead of reading Livingstone's audiences in black-and-white terms, I show how local politics and local history shaped the reception of Livingstone and his projected images.

Similarly, Samuel and Dandeson Crowthers' lantern show before King Pepple in 1867 reveals the complex political negotiation that happened in response to the images on screen. Unlike the missionaries discussed in the preceding examples, my third case study discusses a lantern show in which the projectionists as well as the audience members would have been considered "native" by their contemporaries. For the Crowthers, the lantern show registers as a performance of Britishness. Due to the inclusion of comic material, the Crowthers' lantern show more closely resembles the annual Sunday School treats in Britain than those reported by non-native missionaries. For the Africans in the Crowthers' audience, the lantern show offered an opportunity to consolidate King Pepple's power. Oko Jumbo, one of the king's sub-chiefs, eagerly explained the stories depicted on screen to the other chiefs. In the Gleaner, Oko Jumbo's enthusiastic response speaks to the success of the Crowthers' evangelistic efforts. The original

letter suggests that Oko Jumbo's role as translator was not simply a demonstration of academic mastery of scriptural material for the missionaries. Instead, it reads more as a carefully calculated performance of loyalty for King Pepple. The representation of the Crowthers' lantern shows in print were designed to appeal to juvenile members of the missionary society, who were also significant financial contributors to the London Missionary Society and the Church Missionary Society.

As a study of the nineteenth-century screen experience, this dissertation explores the potential for digital publishing platforms to offer interactive, virtual encounters with archival material. Drawing from my experience as a project scholar for Livingstone Online, I present my analysis of primary sources through a Scalar-powered website. This tool enables me to form my case studies around 3D models of magic lanterns, 360 degree recordings of magic lantern shows, and animated images of slides described in eye-witness accounts. In doing so, I reconstruct the visual effects described by missionaries in their letters as a means to trace the visual tropes that current screen technologies inherited from nineteenth-century technologies. In the dissertation's final chapter, I reflect on the digital methods that I used to mediate projectors, slides, and documents into a digital environment in order to advance a more just representation non-European contributors to the global history of the screen. By characterizing digital remediation as "knowledge design" in Jeffrey Schnapp's sense of the term, I expose the ways in which the dissertation's digital form prompted new directions for scholarly inquiry.

The dissertation concludes with a brief coda on Erewhon (2018), a play that remediates Samuel Butler's novel of the same name (1872). The play exposes and negotiates the colonial underpinnings of Butler's novel through a magic lantern and an iPhone, offering a mode of

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mediation that exposes the limitations of technology through which to view Britain's colonial

past while simultaneously using this technology to image more equitable and ethical futures.

"Layers in Focus": Alternate paths through the dissertation's material

Sections with an asterisk beside them do not appear in the main outline of the dissertation.

Technologies of the Magic Lantern Show
1. Publishing Williams' Life and Death
2. The Material Archive
3. Williams' Lantern and Slides
4. Scriptural Lantern Lecture Sets
      4.1.1. Carpenter & Westley's Catalog
      4.1.2. Visual Variation
      4.1.3. Spoken Narration
      4.1.4. Animating Williams' Lantern Slides
            4.1.4.1.1. Animated Sliders with Flasher
            4.1.4.1.2. Animated Sliders without Flasher
5. "A Light to Lighten the Gentiles"
6. Imagination, Perception, and Presence
7. Livingstone's Lantern(s)
8. Composite Views
9. Projecting Abraham
10. "O! that the Holy Spirit would enlighten them!"

Field-Authored Documents
1. The Material Archive
2. Archiving Williams' letter*
3. Imagination, Perception, and Presence
4. The Presence of the Audience
5. Mapping Materialities
6. Mapping Materialities with Digital Tools
7. The Political Landscape
      7.1.1. Social Lights
      7.1.2. "Regaled our friends"
      7.1.3. The Ishinde
      7.1.4. Kololo competition
      7.1.5. Composite Views
      7.1.6. Conflicting Reports
8. The Lantern as Entertainment
9. Sunday School Treats
10. Remediation as a Research Strategy
11. Interventions

Publications
1. Missionary Narratives in Periodicals
2. Comparing the Announcements*
3. Publishing Williams' Life and Death

Bibliography

To the best of my ability, I have included the technologies of mediation in the citation, particularly in cases where I consulted a digital version of a primary source or used a subscription-based service to access an article. For digital sources, I use the term "accessible" to describe open-access resources that are publically available for free; "available" denotes resources that are hosted by subscription-based and commercial archives. Links to digital content reflect the location and version of the page as of 16 August 2019 (the defense date). Because this content is managed by a third-party, some of the links could change and/or become defunct. To mitigate this, I have selected links from institutions, museums, and repositories that are not likely to change.

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        and Early Cinema, 14th International Domitor Conference, 14 June 2016, Stockholm,
        Sweden.

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Education

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Dissertation: "Shining Lights: Magic Lanterns and the Missionary Movement, 1839—1868"
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M.A. in English
Indiana University, May 2012

B.A. in Comparative Literature with Honors and English
University of North Carolina, May 2009

Digital Humanities and Project Management Experience

CLIR Postdoctoral Fellow in Data Curation for Latin American and Caribbean Studies (July 2019—Present), *Archivo Mesoamericano, Digital Collection Services, Indiana University Libraries*
- Create collection finding aids and teaching materials in Spanish and English
- Supervise quality control specialists
- Monitor hourly worker budget

Project Scholar (August 2015—Present) *Livingstone Online, University of Nebraska*
- Transcribe and encode archival documents according to TEI P5 Guidelines
- Review coding, project documentation, and supporting critical materials
- Promote the project's continued growth through grant applications

Managing Editor (August 2010-May 2014) *Victorian Women Writers Project, Indiana University Libraries*
- Developed partnerships through outreach, conference presentations, and publications
- Facilitated undergraduate contributions to the project
- Managed an undergraduate student worker

Photographer (May 2011-May 2013) *David Francis Collection, Bloomington, Indiana*
- Developed best practices for photographing magic lantern slides
- Documented photography workflow and file naming practices
- Trained new personnel how to use camera rig and project documentation
- Prepared the collection for its relocation to the Kent Museum of the Moving Image in Deal, UK

Pedagogy and Curriculum Development Experience
Digital Pedagogy Specialist (August 2017—July 2019)
Institute for Digital Arts and Humanities, Indiana University
- Developed workshops for scholars with broad disciplinary backgrounds and skill levels
- Coordinated and led in-class activities for History, English, and Religious Studies
- Created sample data sets, step-by-step guides, and teaching materials for in-class use
- Performed educational research to refine the implementation of digital tools in classroom settings in preparation for phase two of NetCreate's development

HASTAC Program Coordinator (August 2017—July 2019)
Services for Digital Humanities and Creative Activities & the Institute for Digital Arts and Humanities, Indiana University
- Crafted strategic plan for the program in collaboration with Tassie Gnaidy (Manager, Services for Digital Humanities and Creative Activities), Kalani Craig and Michelle Dalmau (Co-directors, IDAH)
- Created application guidelines, evaluation criteria, timeline, and applicant review workflow
- Designed, implemented, and refined a modular curriculum to promote measurable progress on HASTAC projects
- Mentored individual HASTAC scholars as they build their professional portfolio
- Gathered quantitative and qualitative data from scholars to identify the program's strengths and future growth opportunities
- Facilitated dispersal of grant funds through IDAH's account

Associate Instructor of English (August 2011—May 2017)
Department of English, Indiana University
- Designed syllabi, in-class activities, and assignments for composition, professional writing, and literature courses
- Supported student growth through skills-based training
- Assessed student progress through creative assignments, critical essays, and exams

Volunteer English as a Foreign Language Instructor (Jan 2015—May 2016)
ViTAL Writing Workshops, Monroe County Public Library
- Created interactive grammar and vocabulary activities for members of the community
- Provided one-on-one conversation practice and writing consultations for EFL learners

Digital Projects and DH Publications
Shining Lights: Magic Lanterns and the Missionary Movement, 1839-1868
A digital monograph (in development) that studies the global dissemination of projection equipment in the hands of British missionaries through curated exhibits of digitized lanterns, slides, letters, journals, and periodical literature
- Manage multimedia content through Scalar, Youtube and Sketchfab
- Build custom page layouts with HTML and CSS
- Preserve cultural heritage objects with Photoscan and Photoshop

- Map key locations with Esri Story Maps

"Magic lanterns through a macroscopic lens: topic modeling, mapping, and media archaeology"
An article in *Early Popular Visual Culture* (forthcoming) that identifies literary tropes across 2,000 published eyewitness accounts of magic lantern shows through a multi-method digital analysis; based on my capstone project for the Digital Arts and Humanities Certificate
- Mined data from Lucerna with SQL
- Cleaned up data with Excel
- Topic modeled documents with MALLET
- Mapped paratextual metadata with Carto

Livingstone's Manuscripts in South Africa: A Critical Edition. Adrian S. Wisnicki and Jared McDonald, directors. University of Maryland Libraries. 2018.
A critical edition of archival material from South African institutions
- Transcribed and encoded approximately 20 letters according to the project's TEI guidelines
- Managed versions of xml files via GitHub
- Revised coding practices based on project documentation in Google Spreadsheets
- Reviewed supporting scholarly essays

Snap-dragons; a tale of Christmas eve, and Old Father Christmas : an old fashioned tale of the young days of a grumpy old godfather. by Juliana Horatia Ewing. London: Society for Promoting Christian Knowledge, 1888. Critical edition hosted by the *Victorian Women Writers Project*. Angela Courtney and Michelle Dalmau, editors. Indiana University Libraries. 2011.
A TEI edition of Julia Horatia Ewing's children's novella with supporting scholarly essays

"Strategies for Sustainable Growth: Lessons Learned through the Victorian Women Writers Project." Digital Studies/Le champ numérique, 7(1), 4. DOI: http://doi.org/10.16995/dscn.276
A white-paper on project growth through pedagogy

Other Publications
Peer-Refereed
"Lasers and plastics and slides, oh my!"
A series of laser-cut and 3D printed mechanical magic lantern slides for Magnetic North's production of *Erewhon* at the 2018 Edinburgh Fringe Festival

"Reverend Smithurst's Wishlist" *The Magic Lantern*. Journal for the Magic Lantern Society of the UK. Fall 2018, p 14.
A short piece for a broad readership about an Anglican missionary who lived in Red River, Canada who requested magic lantern slides

Educational Research and Teaching Resources

"Correcting for Presentism in Student Reading of Historical Accounts Through Digital-History
    Methodologies". Kalani Craig, Joshua Danish (first authors). (In development)
Twenty-First Century Drama: The First Ten Years. Angela Courtney, editor. Detroit: Gale
    Cengage Learning, 2012. Authored critical introductions to the following plays:
    Adventures of a Black Girl in Search of God, *Afterimage*, *In Flagrante Gothico*, *The
    Rubenstein Kiss*, *wAve*

Select Research Grants and Scholarships
Mellon Innovating International Research, Teaching and Collaboration—Office of the Vice
    Provost for Research, Indiana University, November 2015
HASTAC Scholar—Institute for Digital Arts and Humanities, mentor, 2015-2016
Tuition Scholarship for a course on crowdsourcing at the Digital Humanities Summer Institute—
    University of Victoria, June 2015
Tuition Scholarship for a course on database design at the Digital Humanities Summer
    Institute—University of Victoria, June 2012

Keynotes and Invited Papers
"Topical places, textual spaces." Keynote for Space is the Place, Center for Urban Studies,
    University of Antwerp, November 2019.
"'This is a big proverb,' or the adventures of a slipper in Sierra Leone." Magic Lantern Society
    of the US and Canada Convention, Victoria, British Columbia, April 2018.
"Locating Lanternists: Tools for Geographic Analysis." A Million Pictures Project workshop,
    Exeter, UK, January 2018.
"Rev Smithurst's Wish List." Magic Lantern Society of the UK International Conference,
    Birmingham, UK, April 2017.
"Shining Lights: Magic Lanterns in the hands of LMS missionaries, 1839-1890." Christian
    Missions in Global History Seminar Series. School of Oriental and African Studies,
    London, UK, May 2017.

Conference Presentations
"Caches, displays, and mêlées." The World(s) of *John Wick*. Bloomington, Indiana. November
    2019.
"'Coffee' and Other Coding Challenges: Lessons Learned through David Livingstone's
    Manuscripts in South Africa (1843-1872)." Poster presentation. Text Encoding Initiative
    Annual Conference, Tokyo, Japan. September 2018
"Social Lights: Mapping Magic Lantern Shows and Local Performance Practices." Panel on the
    digital spatial turn. North American Victorian Studies Association, Phoenix, AZ,
    November 2016.
"'The oxyhydrogen light of civilization'?: the Untold Story of Livingstone's Lantern." The
    Victorians Institute: Victorian STEAM, North Carolina State University, October 2016.
"Missionaries, Local Peoples, and the Screen Experience: Then and Now." Panel on Livingstone
    Online. Nineteenth-Century Studies Association: The New and the Novel, University of
    Nebraska-Lincoln, April 2016.
"Teaching with TEI: The Victorian Women Writers Project and Virtual Learning
    Environments." Digital Humanities Summer Institute, June 2015.

"Building the Virtual Museum: Nineteenth Century Scholarship and the VWWP." co-authored with Angela Courtney, director of the IU Scholars' Commons. Digital Diversity 2015: Writing * Feminism * Culture, University of Alberta, May 2015.

"Terms of Engagement: Words, Weapons, and Weddings in *As You Like It*." Consent: Terms of Agreement, Department of English, Indiana University, March 2013.

"Voyeur-istically Viewing Middlemarch: Visualization Tools and Traditional Literary Scholarship." Digital Humanities Summer Institute, University of Victoria, June 2012.

Workshops

The Institute for Digital Arts and Humanities' Marking the Arts and Humanities Series
- Project Management through Poster Design (March 2019)
- Intro to Network Analysis (January 2019)
- FrankensTEIn: Teaching Archival Material through Mark-up (October 2018)
- The Franken-Assignment: Going Beyond the Essay (October 2018)

Other Workshops at Indiana University
- Redesigning the Dissertation for the Web: a Case Study (February 2019): Hosted by the Digital Library Brown Bag Series
- This is cool, but what can 3D printing do for me? (September 2018): Hosted by the Center for Excellence for Women in Technology
- Material Cultures of Eighteenth-Century Privilege: Wigs, their Parts and Purposes (May 2018): Hosted by the Center for Eighteenth-Century Studies
- Code with a Kid: The Circuits Edition (October 2017): Co-sponsored by Institute for Digital Arts and Humanities and the Center for Excellence for Women in Technology

Courses Taught

Undergraduate Literature Courses
- English L203: Introduction to Drama
- English L390: Children's Literature (Teaching Assistant)

Undergraduate Composition Courses
- English W131: Reading, Writing, and Inquiry
- English W231: Professional Writing

Professional Contributions and Service

Committee member, MFA candidate Seth Adam Cook, November 2019.

Panelist, "Novel Form Theses—Student Case Studies," Beyond the PDF, University of Iowa Libraries, Iowa City, March 2018.

Panelist, "Digital Horizons for the Dissertation," moderated by Dr. William Adams, former head of the NEH, Bloomington, Indiana. February 2018

Organizer, "Social Victorians," mock panels for IU graduate students attending NAVSA, Scholars Commons, Indiana University. October 2016.

Co-organizer, "Common Ground: The Digital Spatial Turn in Victorian Studies," panel for the North American Victorian Studies Association, Phoeniz, AZ. November 2-5, 2016.

Panelist, discussion of *Hedda Gabler*. Hosted by *Victorian Studies*, Indiana University. October 1, 2015.

Panelist, Pedagogy and Research in the Digital Humanities Roundtable. *Breaking Futures: Imaginative (Re)Visions of Time*, Department of English, Indiana University, March 2015.

Reviewer, *Conrandiana*. Jan 2015.

Coordinator, actor, and pianist. *Gilbert and Sullivan Variety Show*. Hosted by *Victorian Studies* and *CAHI*. February 2014.

Committee member, Graduate Studies Policies and Curriculum, Graduate Student Advisory Committee, May 2014-May 2015.

Assistant lanternist, *Dickens Variety Show*, Buskirk-Chumley Theater, Bloomington, IN. April 2012.

Contributor, *Victorian Studies* Bibliography. Jan 2010, 2011.