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The New Dimension in Sight and Sound:
CinemaScope 55 and the Challenges of Preserving Obsolete Media

A thesis submitted in partial satisfaction
of the requirements for the degree Master
of Library and Information Science

by

Brian Block

2018

ABSTRACT OF THE THESIS

The New Dimension in Sight and Sound:
CinemaScope 55 and the Challenges of Preserving Obsolete Media

by

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Master of Library and Information Science

University of California, Los Angeles, 2018

Professor Shawn G. VanCour, Chair

The two motion pictures made with 20th Century Fox's CinemaScope 55 [CS55] technology, *Carousel* (1956) and *King and I* (1956), are faced with unique practical and theoretical preservation challenges. Innovated in the mid-1950s, the CS55 system utilized a non-standard 55 mm film gauge and customized playback equipment, but due to logistical complications, the technology reached its obsolescence before either of the films were released. Practically, the mechanical resources to preserve both movies from the non-standard 55 mm negatives no longer survive, even though the original film elements have remained intact. Theoretically, determining the form that the preserved works can take is also complicated - both films were initially intended to be experienced in 55mm prints and even though they were successfully reformatted into the more standard 35mm gauge, many of the technical features of the original 35mm prints

can no longer be replicated. This thesis studies these complications by detailing the development of the CS55 technology in the 1950s and then exploring the creative decisions made during Fox's preservation work on *Carousel* and *King and I* in the early 2000s. Films like *Carousel* and *King and I* risk becoming inaccessible without the customized machinery required for playback, and in an effort to maintain the cultural memory of the films, Fox recreated components of the CS55 apparatus from scratch. Although there are many health concerns that threaten a film's long-term sustainability and accessibility, like wear from use and deterioration from improper storage, I focus here on the impact of obsolescence. As I demonstrate, obsolescence can limit or completely eliminate resources for cinema technologies, and these shifts complicate the efforts of the film preservationist. While the dominant preservation trend has long been to *authentically* replicate a motion picture as it was originally experienced, I explore how the content is necessarily *translated* from obsolete carriers into active carriers when essential technology no longer exists. As evidenced by Fox's restorations of their CinemaScope 55 films, preservation is interpretive work, and within the paradigm of obsolescence, new works are created in the process.

The thesis of Brian Block is approved.

Michelle L. Caswell

Johanna R. Drucker

Shawn G. VanCour, Committee Chair

University of California, Los Angeles

2018

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"...it is precisely facts that do not exist, only interpretations..."
-Frederich Nietzsche, 1888¹

Ten Laws of Conservation

Multiplication and dispersal increase chances for survival of information
Books and documents deteriorate all the time
Deterioration is irreversible
Use causes wear
No one can have access to a document that no longer exists
The physical medium of a document contains information
Authenticity cannot be restored
No reproduction can contain all the information contained in the original
Conservation treatment is interpretation
No treatment is entirely reversible
-Paul Banks, 1981²

"CinemaScope 55 [is] the new dimension in sight and sound"
-CinemaScope 55 trade advertisement, 1956³

¹ Frederich Nietzsche, "1888" in *The Portable Nietzsche*, ed. Walter Kauffman, (New York: Viking Press, 1954), 458.

² Michaelle Biddle, "Conservation in a Box: A Primer of Basic Paper Conservation Procedures and Treatments." Retrieved from 2008, accessed February 11, 2018, <https://works.bepress.com/mbiddle/2/>.

³ 20th Century Fox, "CinemaScope 55: The New Dimension in Sight and Sound," advertisement, Widescreen Museum, accessed March 23, 2017, <http://www.widescreenmuseum.com/widescreen/cs55ad.htm>.

Introduction

The CinemaScope 55 Story: Part I

Starting in 1955, 20th Century Fox attempted to establish CinemaScope 55 [CS55] as a widescreen system capable of capturing such high-quality images that - in the words of its engineers - "no other process, no matter how wide the film, could yield a better technical result on screen."⁴ Along with customized cameras, lenses, and playback equipment, CS55 used a unique new carrier of moving image content - a film gauge that was 55mm wide. In "The Widescreen Revolution and 20th Century Fox's Eidophor in the 1950s," film historian Kira Kitsopaniidou says that Fox invested in "the realism" of wide images in order to maximize the "immersion and participation" of their audience.⁵ CS55 was an innovative motion picture format that enhanced film's technical capacity and its expressive power as an art form. By developing and utilizing CinemaScope 55, Fox claimed they were pushing cinematic experiences into a "new dimension in sight and sound."⁶

Fox introduced CinemaScope 55 during a bloody war of film formats, which Kitsopaniidou refers to as the "widescreen revolution."⁷ Film historian John Belton says in *Widescreen Cinema* (1992) that in the 1950s, the industry created "radically different spectatorial experiences," to maintain their shrinking theatrical audience.⁸ Fox demonstrated CS55's

⁴ Letter, dated June 19, 1956; "55mm" folder, Box 109, Sponable Collection, Columbia University Libraries, (all citations from Sponable Collection are sourced through Columbia University Library) quoted in John Belton "Fox and 50mm" in *Widescreen Worldwide*, eds. John Belton, Sheldon Hall, and Steve Neale, (Bloomington, IN: Indiana University Press, 2010), 21.

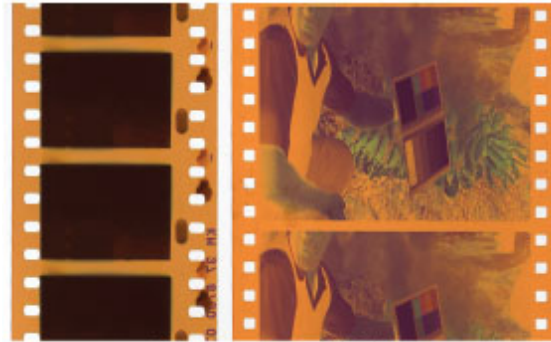
⁵ Kira Kitsopaniidou, "The Widescreen Revolution and 20th Century Fox's Eidophor in the 1950s," *Film History* 15, 1 (2003): 44.

⁶ 20th Century Fox, "CinemaScope 55: The New Dimension in Sight and Sound,"

⁷ Kitsopaniidou, "The Widescreen Revolution and 20th Century Fox's Eidophor in the 1950s," 32.

⁸ John Belton, *Widescreen Cinema*, (Cambridge, Mass: Harvard University Press, 1992), 69.

competitive edge by using it to produce adaptations of two hugely successful Rodgers and Hammerstein stage musicals, *Carousel* (1956) and *King and I* (1956).⁹ These highly-anticipated



[Left: 35mm negative. Right: 55mm negative. Image from: Cineric, "Restoring Cinemascope 55," in 70mm, accessed February 20, 2018 http://www.in70mm.com/news/2005/cinemascope_55/index.htm.]

releases were intended to function as “Trojan Horses”¹⁰ that would help CS55 gain entry into a crowded market and overtake other dominating widescreen systems. In that era, movies didn’t only tout their movie stars - according to Fox’s Executive Vice President of Media and Library Services, Schawn Belston, “advances in image quality and stereophonic sound were also given top billing.”¹¹ Although exhibiting *Carousel* and *King and I* in CS55 provided a “rationale”¹² for theaters to convert their projection equipment, Fox also wanted to use 55mm CinemaScope to improve the presentation for venues that had installed their 35mm CinemaScope system [CS35].

Despite the low resolution images that it reproduced, after its introduction in 1953, CS35 was

⁹ Note 1: *Carousel* initially opened as a stage musical in April 1945 and ran for 890 performances at the Majestic Theatre - almost two straight years, closing on May 24, 1947 [“Carousel,” Playbill, accessed January 23, 2018, <http://www.playbill.com/production/carousel-majestic-theatre-vault-0000013229>]. When it opened in the UK on June 7, 1950, it received a similar enthusiasm, playing for a year and a half with 566 performances [Stanley Green, *Encyclopedia of The Musical Theatre: An Updated Reference*, (New York: Da Capo Press, 1980), 63–64]

Note 2: *King and I* initially opened as a stage musical on March 29, 1951 and ran for 1,246 performances at the St. James Theater, closing on March 20, 1954 [“King and I,” Playbill, accessed January 23, 2018, <http://www.playbill.com/show/detail/4210/the-king-and-i>.]

¹⁰ David Bordwell, *Pandora’s Digital Box*, (Madison, WI: Irvington Way Institute Press, 2012), 195.

Note: While Bordwell is not talking about CinemaScope 55 in this text, he is talking about an analogous subject - the adoption of digital exhibition technology in the 2000s. The Trojan Horse metaphor is borrowed from Bordwell.

¹¹ Cineric “Restoring CinemaScope 55”

¹² Bordwell, *Pandora’s Digital Box*, 195. Note: also see footnote 9.

quickly adopted throughout the world. However, its supremacy became threatened by other widescreen systems that followed, like Paramount's VistaVision and Magna's Todd-AO. Fox worked to address CS35's shortcomings, and their solution was to create a larger negative that could be used for "printing down" to 35mm.¹³ By using reduction printing from a larger negative, Fox could inject "more visual material" into a 35mm positive and the result was a better quality print.¹⁴ Fox settled on a 55mm negative because its picture area was four times the size of 35mm. Since the 55mm negative served as the source for higher resolution CS35 prints and razor-sharp CS55 prints, CinemaScope 55 could be used to battle the competing standard and large format windscreen technologies.

While CinemaScope 55 was "successfully innovated," as Belton explains in his 2010 essay, "Fox and 50mm," it "can be considered a 'failed' technology."¹⁵ CS55 is a rare example of a moving image system that was created, utilized, and promoted but ultimately aborted by its creators before it reached the public. Fox employed CS55 at nearly every stage of production for both *Carousel* and *King and I*, but at the very end, the studio made an eleventh-hour decision not to use 55mm prints for theatrical exhibition. Shortly before *Carousel* premiered, the studio's Vice President, Daryl Zanuck, watched a 35mm reduction print of the film and said the public would "not know the difference between regular CinemaScope and CinemaScope 55."¹⁶ 55mm prints were more expensive to manufacture, and Zanuck decided that Fox could save money by only

¹³ HH, "55mm CinemaScope" *Films in Review* December 1955 quoted in Martin Hart, "Films in Review 55mm," Widescreen Museum, accessed January 27, 2018, <http://www.widescreenmuseum.com/widescreen/filmsinreview55mm.htm>

¹⁴ Ibid.

¹⁵ Belton "Fox and 50mm," 21.

¹⁶ Letter, Zanuck to W.C. Michel, dated November 13, 1958, Zanuck folder, Box 116, Sponable Collection quoted in Belton, *Widescreen Cinema*, 154.

releasing the CS55 films in 35mm. In the war of formats, CS55's death meant that Fox had surrendered, and they joined the winning side by investing in Todd-AO's 70mm system. No longer trying to create a Trojan Horse, Zanuck recognized that Todd-AO's *Oklahoma!* (1955) and *Around the World in 80 Days* (1956) pulled in high grosses, saying that the system "was associated in the public's mind with two enormously successful films."¹⁷ Fox quietly experimented with their CS55 equipment up through 1958,¹⁸ but the process was not used to produce any motion pictures after *King and I*.

The CinemaScope 55 Story: Part II

From 2003 to 2004, 20th Century Fox attempted to preserve *Carousel* and *King and I* from their original 55mm negatives so as to capture - in the words of their preservationist - a "totally authentic" experience of the films.¹⁹ In *From Grain to Pixel* (2009), archival scholar Giovanna Fossati says that as film archives work to ensure that aging motion pictures reach "a form that can be shown to an audience," preservationists focus on authentically bringing "archival film back to a form that is as close as possible to the original."²⁰ This approach to preserving a motion picture's originality is reflected in Fox's restoration of their CS55 films, which was led by Fox's Executive Vice President of Media and Library Services, Schawn Belston, in collaboration with Cineric Lab's Director of Technical Operations, Simon Lund.

¹⁷ Letter, Zanuck to Michel, dated October 23, 1958, Zanuck Folder, Box 116, Sponable Collection. quoted in Belton, *Widescreen Cinema*, 155.

¹⁸ Peter Lev, *Twentieth Century-Fox: The Zanuck-Skouras Years, 1935 - 1965* (Austin: University of Texas Press, 2013), 175.

¹⁹ Schawn Belston, interview by the author, tape recording, Los Angeles, March 14, 2017.

²⁰ Giovanna Fossati, *From Grain to Pixel*, (Netherlands: Amsterdam University Press, 2009), 71.

Belston started working in Fox's archive in the late 1990s, as authentic preservation practices were beginning to gain widespread acceptance. Prior to this era, film preservation centered on providing access to films through duplication. Films that were considered at-risk, due to being printed on unstable film stocks, were copied onto more sustainable carriers, and this was done with less regard for preserving a film's originality.²¹ In the highly influential report of the Librarian of Congress, *Film Preservation 1993*, Annette Melville and Scott Simmon explain that while "preservation has usually been synonymous with duplication...for a variety of reasons, this definition of preservation is being rethought."²² Melville and Simmon say that "preservation is increasingly being defined less as a one-time 'fix' (measurable in footage copied) than as an ongoing process...[the process] goes beyond the physical copying of surviving material into reconstruction of the most authentic version of a film."²³ Reflecting this approach, Belston summarizes Fox's preservation mission in saying that while "copying" is a necessary component of saving cinema, the practice also requires intervention on the part of the preservationist. Belston says, "Fox has invested significantly in making the best possible photochemical preservation elements on our feature film library, systematically inspecting and copying the best

²¹ Note: Up to the early 1950s, 35mm film was commonly manufactured with a nitrocellulose base, which engineer Ralph Sargent says was a "dangerous material to manufacture, use and store," because it was "unstable chemically." Prior to the 1990s, when film preservation was considered more of a duplication practice, the goal was to transfer prints with nitrate bases to "safety" stocks with acetate bases. Ralph Sargent, *Preserving the Moving Image*, (US: Corporation for Public Broadcasting and the National Endowment for the Arts, 1974), 16.

²² Annette Melville, Scott Simmon, Library of Congress, & National Film Preservation Board, *Film Preservation 1993: A Study of the Current State of American Film Preservation*, (Washington, D.C.: National Film Preservation Board of the Library of Congress, 1993), 5 - 6.

²³ Melville, *Film Preservation 1993: A Study of the Current State of American Film Preservation*, 5 - 6.

possible elements.”²⁴ In an interview with me specifically about his work on *Carousel* and *King and I*, Belston says he “went down a rabbit hole, trying to be as authentic as possible.”²⁵

Although the original 55mm film elements remain intact for *Carousel* and *King and I*, the original mechanical resources do not - when the CS55 process was abandoned, the playback technology was discarded. Throughout the preservation process, the lack of available CS55 machinery created major difficulties for Belston and Lund. To adequately extract and reformat content from the 55mm carriers, Cineric's machine shop emulated the CS55 playback equipment - the lab created compatible parts from scratch and used them to retrofit their modern optical printer. Fossati refers to this practice as a “simulation,” explaining that, “because the history of cinema has seen a succession of different film formats and color and sound systems, all of which have become obsolete or have been modified one way or the other [...], the restorer has no other choice than to simulate what was there by means of the tools available at the time of restoration.”²⁶ In their preservation work on *Carousel* and *King and I*, Fox and Cineric went to significant lengths as they attempted to bring both films to a level of permanence.

Argument

Motion pictures are inherently impermanent because film is a machine-dependent²⁷ medium and its machines are constantly evolving. Motion picture technology appears, changes, and disappears at different rates, though CinemaScope 55 is unique in that it went out of service

²⁴ Jared Rapfogel and Andrew Lampert, “Film Preservation,” in *Cineaste*. Vol. 36, Issue 4, Fall 2011.

²⁵ Belston, Interview.

²⁶ Fossati, *From Grain to Pixel*, 142.

²⁷ Note: The Glossary of the Society of American Archivists says “machine dependent” is “commonly used to describe software that can run only on a specific type of hardware, such as a specific processor. It can also be used to describe film or audio media that requires specific recording and playback equipment.” From: Society of American Archivists, “machine dependent,” Archival and Records Terminology, accessed April 10, 2018, <https://www2.archivists.org/glossary/terms/m/machine-dependent>.

before it existed. Like wine in a bottle, moving image content can become trapped in its carrier without equipment available to uncork it. Although there are many health concerns that threaten film's long-term accessibility and sustainability, like wear from use and deterioration from improper storage, this study focuses on the impact of obsolescence. Obsolescence threatens the longevity of motion pictures by limiting or completely eliminating resources for moving image technologies, and these shifts complicate the efforts of the film preservationist. Films like *Carousel* and *King and I* risk becoming inaccessible without customized machinery required for playback, but as with their original releases, they can continue to be seen if they are reformatted.

CinemaScope 55 prematurely reaching its end of life didn't prevent *Carousel* and *King and I* from reaching the public, though it did prevent the films from taking a form that reached the full potential of the technology. In thinking about the future of both films, CS55's obsolescence creates practical challenges for utilizing the surviving elements and theoretical challenges for considering what form the preserved works can take. Did CS55's *obsolescence* mean that the original CS35 prints were the *authentic* versions of the films or that they were *translations* into an alternate technological language? This essay uses that question as a blueprint to build its argument. I first look at film preservation within the paradigm of *obsolescence* and explore how content must be reformatted if it relies on motion picture playback and carrier technologies that have become obsolete. However, the guiding preservation principle of faithfully emulating "the original" through reformatting is contradictory - in his "10 Laws of Conservation," archival scholar Paul N. Banks argues, "authenticity cannot be restored."²⁸ I term this approach to preservation the *authenticity-based model* and show how this method becomes

²⁸ Biddle, "Conservation in a Box: A Primer of Basic Paper Conservation Procedures and Treatments."

impossible if the original carrier and technological means can no longer be utilized. Third, I offer as an alternative what I call the *translation-based model*, which suggests that film preservation transforms original works into new works, as opposed to returning them to their initial state. To this point, Banks offers yet another law, saying that "conservation treatment is interpretation."²⁹ By considering CinemaScope 55 as a technological language, the content of *Carousel* and *King and I* can continue to be re-interpreted and shared through new communication technologies that emerge over time.

As old technologies meet extinction and new technologies reach speciation, the language of film changes, and as preservationists set out to maintain the cultural memory of motion picture content, they translate it from obsolete carriers to active carriers. In the translation process, preservationists modify content and this results in a new interpretation of the source material. In the field of translation studies, scholars recognize that instead of setting out to make equivalents, translators transform their source material into something new. In their 2015 piece, "Translating Worlds: The Epistemological Space of Translation," linguistic anthropologists Carlo Severi and William F. Hanks say that content is "altered in the process of translation, which is pervasively and systematically neologistic."³⁰ In creating new works through translation, some literary critics say that the craft of the translator resembles the creative craft of the artist. In *A High Art* (1964), literary critic Kornei Chukovskii says that the translator "is not a handyman, not a copyist, but an artist...a translator does not photograph an original text, he re-creates it through art."³¹ By

²⁹ Ibid.

³⁰ Carlo Severi and William F. Hanks, "Translating Worlds: The Epistemological Space of Translation," in *Translating Worlds: The Epistemological Space of Translation*, eds. Carlo Severi and William F. Hanks, (Chicago: Hau Books, 2015), 9.

³¹ Kornei Chukovskii, *The Art of Translation*, trans. Lauren G. Leighton (Knoxville, University of Tennessee, 1984), 6.

attempting to reformat motion pictures that rely on obsolete technology, preservationists use technological means to interpret existing media and translate it into new media, and this is similar to how filmmakers utilize film technology to adapt stage musicals into motion pictures. Preservationists perform interpretive work and use new languages to express their new works as solutions to technological problems. By considering the reformatting process as a method for addressing obsolescence, this study uses the CinemaScope 55 story to show how moving image preservation not only requires skill and expertise but also creativity. The end result of any preservation project is a simulacrum that takes the original work of art into a “new dimension in sight and sound.”³²

Method and Structure

This study retells the life story of CinemaScope 55 and uses the historical details as reference points for its theoretical analysis. The story portion fills the first two sections of the paper, and the analysis fills the final three sections of the paper. The first section of the story cuts into the birth and death of CS55, and the second story section explores the afterlife of CS55, focusing on Fox’s efforts to preserve *Carousel* and *King and I*. To recount the CinemaScope 55 story, I performed archival research, analyzed promotional materials, engaged with scholarly writing, studied trade journals, and interviewed preservationists and engineers. The first section of the CS55 story is largely indebted to the work of widescreen scholars, Kira Kitsopanidou and John Belton. I also did archival research at Columbia University’s Rare Book and Manuscript Library, which holds the papers of Fox’s Chief Engineer, Earl I. Sponable. The second section of

³² 20th Century Fox, “CinemaScope 55: The New Dimension in Sight and Sound.”

the CS55 story is built from interviews I conducted with Fox's Schawn Belton and Cineric's Simon Lund.

In the first two sections, I frame the CS55 story by incorporating theory from John Belton, and archival scholars, Michelle Caswell, and Theodore R. Schellenberg. In the first section, I use Belton's "failed technologies" approach from his article, "Fox and 50mm," to explore how CinemaScope 55 "took up time, occupied space, and shaped the overall technological terrain."³³ Even though CS55 is a "failed"³⁴ technology, it existed, addressed technological problems and can therefore be analyzed for its historical impact. To Belton, abandoned systems like CS55 "were just as real, significant and meaningful as successful technologies."³⁵ CS55 was *successfully* created, but it only really *failed* to make it to the public - instead of looking exclusively at what failed technologies *could have been*, Belton suggests looking at what *actually was*.

In the second section, I use Michelle Caswell's "social life of archival objects approach," from *Archiving the Unspeakable* (2014) and T. R. Schellenberg's archival evaluation methods from his 1956 piece, "Appraisal of Modern Public Records." In *Unspeakable*, Caswell focuses on "the social life of one collection of mug shots taken by the Khmer Rouge at the notorious Tuol Sleng prison."³⁶ While my text doesn't study human rights injustices, it does trace the social life of things in archival collections, and in that regard, Caswell's work was enormously influential. I look at the CinemaScope 55 film elements as archival things and explore how their

³³ Belton, "Fox and 50mm," 10.

³⁴ Ibid.

³⁵ Ibid.

³⁶ Michelle Caswell, *Archiving the Unspeakable*, (Madison, Wisconsin: University of Wisconsin Press, 2014), 7.

values changed throughout the preservation process. Appraising the value of archival things is one of the archivist's core tasks, and Schellenberg developed foundational principles for this practice. In "Appraisal of Modern Public Records," he suggests identifying the intended or "primary values" of records and also the unintended or "secondary values" that emerge from these records over time.³⁷ I blend Caswell and Schellenberg to understand how CS55 went from being an improved means of communication to impractical, useless materials and finally to works of cultural heritage.

This study's three analytical sections explore obsolescence, authenticity, and translation in support of my claim that film preservationists are artists. Starting in section three, I explore how obsolescence necessitates reformatting, and in the examination, I incorporate the work of media scholars William Uricchio and Matilde Nardelli. In Uricchio's 2015 essay "Replacement, Displacement, and Obsolescence in the Digital Age," he suggests a model for exploring two coexisting narratives in obsolescence; one where old technologies are completely "replaced"³⁸ or *invalidated* by new technologies, and another where old technologies are "displaced" or *reevaluated* by new technologies. In the displacement scenario, new technologies become dominant, but they coexist with the old technologies and give them a different set of values - as an example, Uricchio says that automobiles "repositioned" horses but did not make them obsolete.³⁹ I use Uricchio's thinking to show that when old moving image technologies are replaced, the content becomes displaced and reevaluated through reformatting. Nardelli also

³⁷ T.R. Schellenberger, "Nature of Archives," in *Modern Archives*, (US: Kansas State Historical Society, 1998), 16.

³⁸ William Uricchio, "Replacement, Displacement, and Obsolescence in the Digital Age," in *Cultures of Obsolescence*, eds Babette B. Tischleder and Sarah Wasserman, (New York, Palgrave Macmillan, 2015), 99

³⁹ Uricchio, "Replacement, Displacement, and Obsolescence in the Digital Age," 101.

writes about the changing roles of technology over time, and in her 2009 essay "Moving Pictures: Cinema and Its Obsolescence in Contemporary Art," she hones in on the "prolepsis"⁴⁰ of obsolete film apparatuses, specifically by looking at sculptural works of art that physically incorporate abandoned moving image carriers and equipment. Nardelli says, "what obsolescence ultimately enacts here is not the fossilization of cinema but its plasticity; not its death but its continuation," and so by putting dead motion picture technology in this setting, it is given new meaning and purpose.⁴¹ I apply Nardelli's thinking to demonstrate that taking obsolete technologies out of a production context and using them in a preservation context is similar to the recontextualization work of the artist.

In section four, I poke holes in the problematic concept of authenticity that has traditionally guided the preservation of moving images. In this section, I blend in words from critical theorist Walter Benjamin's 1935 piece "The Work of Art in the Age of Its Technological Reproducibility" and archival scholar Giovanna Fossati's *From Grain to Pixel* (2009). Benjamin says that "the whole sphere of authenticity eludes technological reproduction,"⁴² which means that works lose their unique qualities when they are copied. Although he is referring to a loss of authenticity in what Banks calls the "multiplication and dispersal"⁴³ of materials for their initial release, Benjamin's critique has implications for reproducing films for preservation purposes as well. By using Benjamin's words, I show that preservation leads to works that deviate from their

⁴⁰ Matilde Nardelli, "Moving Pictures: Cinema and Its Obsolescence in Contemporary Art," in *Journal of Visual Culture* Volume: 8 issue: 3, (December 2009): 259.

⁴¹ Nardelli, "Moving Pictures: Cinema and Its Obsolescence in Contemporary Art," 245.

⁴² Walter Benjamin, "'The Work of Art in the Age of Its Technological Reproducibility: Second Version,'" in *The Work of Art in the Age of Its Technological Reproducibility, and Other Writings on Media*, trans. Harry Zohn, eds. Michael W. Jennings, Brigid Doherty and Thomas Y. Levin, (Cambridge/London: The Belknap Press, 2008), 21.

⁴³ Biddle, "Conservation in a Box: A Primer of Basic Paper Conservation Procedures and Treatments."

source material instead of representing them authentically. Fossati also looks at how duplicating a motion picture diminishes its uniqueness, and she specifically considers this for new materials produced through film preservation. Fossati critically examines the preservation goal of "bringing an archival film back to a form that is as close as possible to the original,"⁴⁴ which she says is ultimately an interpretive endeavor. Instead of following a standardized set of practices to maintain a film's authenticity, Fossati says: "the restorers' work is based on their knowledge of the historical context from which the work to be restored originates, of the technology used to produce it, as well as the knowledge of the work itself and its maker(s)[...]based on this knowledge, the restorer will finally resort to interpretation to restore the original look of the work."⁴⁵

In section five, I suggest that preservationists translate motion picture content across technological languages. In this section, I import theory from linguistic anthropologist John Leavitt's 2015 text, "Words and Worlds: Ethnographies and Theories of Translation." Leavitt agrees with the earlier Severi and Hanks quote, saying that translation results in "alteration," because inevitably "the original is thinned out (deficiency)" or "thickened up with material that wasn't there in the original (exuberance)."⁴⁶ Leavitt says the unavoidable "deficiency" and "exuberance" invalidates attempts to translate faithfully or authentically, and this is because literary translators work with more than words. Values are placed in source materials, meaning that "any translation is a translation of cultures or worlds."⁴⁷ Translation is interpretive work and

⁴⁴ Fossati, 71.

⁴⁵ Ibid, 91.

⁴⁶ Leavitt, "Words and Worlds: Ethnographies and Theories of Translation," in *Translating Worlds: The Epistemological Space of Translation*, eds. Carlo Severi and William F. Hanks, (Chicago: Hau Books, 2015), 262.

⁴⁷ John Leavitt, "Words and Worlds: Ethnographies and Theories of Translation," 263.

the outcome can vary depending on the intended use and whether it respects the intention of the source material's creator. Leavitt says that translation, "is always carried out *within* what has been called the target culture" and that "translation serves purposes that are defined by the target society."⁴⁸

In the conclusion, I show that when obsolescence threatens the accessibility of motion picture content, film preservation becomes creative work. Obsolescence makes moving image content unplayable, and preservationists work to maintain the playability of content by devising strategies for migrating it from obsolete carriers and into new forms. Reformatting efforts rely on and incorporate technological processes, but film preservationists do not automatically duplicate or reproduce moving image content. Determining the essential elements of an original work and constructing ways to represent these attributes in a new work is highly subjective. This is to say that two preservationists can address the same project very differently. Ultimately, there is no consensus on how best to do this work, and as exemplified by Fox's preservation on their CinemaScope 55 films, it often requires ingenuity and creativity to create film preservation materials. As moving image technologies continue to evolve, film preservationists attempt to combat obsolescence and prolong a movie's lifespan. Archival scholars Paul Read and Mark-Paul Meyers position these two tasks as two different roles that are on opposite ends of a spectrum. In their *Restoration of Motion Picture Film* (2000), Read and Meyers say:

in general it is possible to distinguish different 'kinds' of film restorers. There is the archivist restorer, working as a kind of archeologist on the materials, trying to

⁴⁸ Leavitt, 279.

reconstruct the history of a print and the production process of a film. Or there is the artist-restorer, using the old materials as a source for a new product.⁴⁹

While I agree that there are ‘kinds’ of preservationists, I do not think they are distinguished by their archeological or artistic contexts. Instead, the ‘kinds’ are defined more by what Leavitt considers to be the “target”⁵⁰ for text translation. In preservation, the target is shaped by the divergent needs of commercial, academic or archival settings. Despite the many targets, film preservationists are always required to address both archeological and artistic concerns when essential moving image technologies become obsolete. In this study, I highlight both of these elements of film preservation, with an emphasis on the artistic, in order to add a theoretical dimension to the work of the preservationist. This theoretical exploration brings the many layers of the CinemaScope 55 optical technology into focus to shed light on the artistic work that film preservationists perform.

⁴⁹ Paul Read and Mark-Paul Meyers, *Restoration of Motion Picture Film*, (Boston: Butterworth Heinemann, 2000), 69.

⁵⁰ Leavitt, 279.

TWENTIETH CENTURY-FOX FILM CORPORATION

INTER-OFFICE CORRESPONDENCE ONLY

DATE January 20, 1955

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Mr. Spyros P. Skiburas
January 20, 1955

cost, but also the likelihood of giving poor quality in the theatres, and the constant requirement of head adjustment. We have underway what appears to be a good solution to this problem and it seems likely that the improvements will be effected during the current year.

11. SPECIAL THEATRES:

If our competition forces us to do so we will have available in the Super-CinemaScope procedure the basic films required for special showing. This might involve reducing the 4X negative to a picture somewhat larger than the present CinemaScope, and on this piece of film carry six or more magnetic tracks. Although we have some general thoughts regarding such a procedure we do not intend to go ahead with it until we determine the necessity as a result of evaluating release prints made under standard CinemaScope conditions. If one were to engineer a system for a special theatre showing there are many new innovations that could be built into such a system which would produce effects that have heretofore never been demonstrated.

E. I. Sponable

[Above: In a memo by Twentieth Century Fox's Chief Engineer, Earl Sponable, he describes competitive and technical aspects of CinemaScope 55 in an early stage of its development, when it was still called "Super CinemaScope."]

Image from: "Supplement to Memorandum of January 11 in re Super CinemaScope" dated January 20, 1955, "Super CinemaScope 1955" folder, Box 115, Sponable Papers. Photo by author.]

Section 1: CinemaScope 55 History, Part I

The first section of this essay details the life story of Twentieth Century Fox's CinemaScope 55 technology, from its birth to its death. It starts with an exploration through the economic and technological forces that led to its creation and then delves into the incoherent marketing and implementation struggles that prevented it from becoming fully realized. CS55 and the other widescreen systems of the 1950s emerged in the shadow of another technology - after World War II, television became an increasingly popular medium, and this caused movie theater attendance to decline dramatically. Although this external economic force led to heavy losses, the film industry regained its audience by introducing new widescreen technologies that far surpassed TV's presentation capabilities. Each new widescreen system attempted to outdo those that preceded it, and this competitive economic force within the film industry led to a format war. Fox's CinemaScope system cheaply and practically achieved wide images through minor equipment adaptations and was popular when first introduced. However, the CS35 lenses had aberrations that distorted the picture, and as newer, less flawed systems emerged, these technical issues made CS35 less of a box office draw. To address these economic and technical crises, Fox created CinemaScope 55, which produced a spectacle that exceeded TV, the other widescreen systems, and even CS35.

Even though CinemaScope 55 was used to produce *Carousel* (1956) and *King and I* (1956), it was never used as a means to exhibit either film publicly. Fox failed to adequately distinguish the system's capabilities in publicity, exhibitors resisted CS55 conversions as the revolving door of new formats continued to spin out of control, and *Carousel* was a box office failure. In the end, the technology was abandoned by Fox after they used it to produce *King and*

I. Though CinemaScope 55 was ultimately an unrealized technology, it held a public profile before it became obsolete and therefore warrants further study.

The CS55 narrative is framed here using tools devised by John Belton, who explores many of Fox's "failed"⁵¹ technologies in his 2010 essay, "Fox and 50mm." None of the systems he surveys were ever actually deployed, though he argues that behind the scenes, they were "successfully innovated,"⁵² and can therefore be studied for their historical impact. Instead of looking at what a "failed" technology *failed to be*, Belton looks at what it *actually was*:

The history of film technology is a history of both successfully innovated technology and failed technologies. Failed technologies often never enter into 'official histories.' From a certain perspective, they 'did not happen.' But, of course, they did. They took up time, occupied space, and shaped the overall technological terrain. At a certain moment in time, they dominated the thoughts, and influenced the research of innovators in ways that were just as real, significant and meaningful as successful technologies.⁵³

Belton's failed technology approach is phenomenological at its core, building off of work by philosopher Maurice Merleau-Ponty. Belton quotes Merleau-Ponty, who says that the significance of an object becomes clearer when viewing it from a "compound of perspectives," or within a "phenomenal field."⁵⁴ In constructing this prismatic view of moving image technologies, Belton uses primary sources that weren't always available to the public, and this includes the personal papers of studio executives and engineers that enter archives over time.

⁵¹ Belton, "Fox and 50mm," 21.

⁵² Ibid.

⁵³ Ibid, 10.

⁵⁴ Maurice Merleau-Ponty, *Phenomenology of Perception*, trans. Colin Smith (London: Routledge & Kegan Paul, 1962), 60. quoted in Belton, "Fox and 50mm," 10.

Belton uses unrealized technologies like CS55 as “objects of study,” and says the identities of these objects crystallize by being studied from “multiple vantage points.”⁵⁵

In this first section, I incorporate Belton’s methodology to create a “phenomenal field” for CinemaScope 55. CS55 stands out among other failed motion picture technologies because it almost crossed the threshold into an “official history.” It left a trace in studio memos, trade publications, advertising materials, and even on the completed films themselves - all of which I analyze to look at the factors that catalyzed CS55’s development and halted its implementation. In the process, I build on the work of Belton and also borrow structurally from media theorist Brian Winston. In Winston’s 1990 piece, “How Are Media Born,” he uses a model for technological innovation that shows there are “accelerators pushing the development of media and other technology,” and also brakes that “slow the disruptive impact of technology.”⁵⁶ For CS55’s accelerators, I look at the economic factors, including competition from television and other widescreen technologies, and the technical factors, including Fox’s need to address the shortcomings of their CS35 system. For CS55’s brakes, I look at the system’s confusing marketing, the format fatigue experienced by the industry, and the weak box office for *Carousel*. By evaluating CS55 with Belton’s “failed technologies” approach, I argue that through multiple vantage points it becomes clear that the system only really “failed” to make it to the public - this section looks at how CinemaScope 55 *actually was* “real, significant, and meaningful.”

⁵⁵ Belton, “Fox and 50mm,” 10.

⁵⁶ Brian Winston, “How Are Media Born?” in *Media Studies: A Reader, 2nd edition*, eds. Paul Marris and Sue Thornham, (New York: NYU Press, 2000), 797.

CS55 Accelerators: Competition with Television

After World War II, the film industry began experiencing major disruptions that changed the shape of its business. In part, Americans began spending their free time differently, and while they were still lured by moving images, they no longer sought out the content in big screen form. At the start of the 1950s, the TV was becoming a more common feature in American homes. Although the sets were small, they gave viewers freedom and flexibility, and their overwhelming success meant that the film industry would need to adapt. This accelerated the movie business's attempt to distinguish itself from TV - to maintain their economic stability, the film industry made movies bigger and better than television by widening the shape of its image

In 1948, the watershed anti-trust lawsuit, "United States V. Paramount Pictures, Inc.," caused anxiety. The case decided that major studios like Fox could no longer own movie theaters in the US, meaning Hollywood suddenly didn't have "a guaranteed outlet for their films."⁵⁷ Attendance at American movie theaters also began to drop significantly - figures went from 90 million attendees in 1948 to only 45 million in 1952.⁵⁸ The public was growing disenfranchised with motion pictures, shifting its attention to other activities and media. In Ali Zaki Elgabri's 1964 UCLA thesis, *The First Two Years of CinemaScope*, he surmises that Americans turned away from movie theaters because of post-war "prosperity."⁵⁹ Elgabri argues that an abundance of gasoline allowed consumers to venture outside of the cities and move into suburbs, further

⁵⁷ Bohn and Stromgren, *Light and Shadows: A History of Motion Pictures*, 240.

⁵⁸ Richard Haines, *Technicolor Movies: The History of Dye Transfer Printing*. (Jefferson, North Carolina: McFarland & Co, Inc., 1993), 61. Note: Haines maps the following decline in movie theater attendance: 1946: 95 million; 1947: 90 m; 1948: 90 m; 1949: 70 m; 1951: 54 m; 1950: 60 m; and 1952: 45 m.

⁵⁹ Ali Zaki Elgabri, "First Two Years of CinemaScope: A Thesis Submitted in Partial Satisfaction of the Requirements for the Degree Master of Arts in Theater Arts," (Masters thesis, University of California - Los Angeles, 1964), 5.

away from centralized sites with movie theaters. Belton agrees, saying that "the decline of the movies" occurred within a "changing leisuretime market " which led to "the metamorphosis of the habitual moviegoer into a sometime spectator."⁶⁰ Americans still craved moving images, though they began to seek them out through alternative means because big screen entertainment was suddenly less desirable and considering their proximity, less accessible.

The late 1940s witnessed sales of Television sets begin to skyrocket. Film historians Thomas Bohn and Richard Stromgren say in *Light and Shadows* that by 1949 there were 1.6 million TVs sold in the US and by 1950 that number grew to 6 million.⁶¹ Richard Haines says that "the years 1948 through 1952 were critical for the film industry [...] it was in a state of panic, and television was the culprit."⁶² While television wasn't the only "culprit," it did pose a major tangible threat to big screen motion pictures, which can be more adequately situated as one of many symptoms of a changing cultural landscape. As Belton says, "disposable income" became more readily available, and a "new middle class required something different from the previous generation of moviegoers, which was now being serviced by television."⁶³ Once a TV set was purchased, it was free to watch, and this led to more freedom for the viewer, especially if they were considering whether to leave the house for a movie or to stay in and watch television.

However, there were types of entertainment that TV couldn't provide. For instance, Kitsopanidou says, "Broadway musicals were perceived as a form of entertainment radically

⁶⁰ Belton, *Widescreen Cinema*, 70.

⁶¹ Thomas H. Bohn and Richard L. Stromgren, *Light and Shadows: A History of Motion Pictures*, (California: Mayfield Publishing Company, 1987), 239.

⁶² Richard Haines, *Technicolor Movies: The History of Dye Transfer Printing*, 60.

⁶³ Belton, *Widescreen Cinema*, 83.

different from home television."⁶⁴ Emphasizing larger-than-life musical content in a motion picture could be used to regain audiences. Belton said that audiences in the 1950s also "sought out lavishly made spectacles,"⁶⁵ and this includes hit travelogue extravaganzas like *This is Cinerama* (1952), costume pictures like *The Robe* (1953), and, of course, musicals like *Oklahoma!* (1955) and *King and I* (1956). In particular, *The Robe* and *King and I* were both Fox productions and were crafted as vehicles to demonstrate the power of new technologies with CinemaScope in 1953 and CinemaScope 55 in 1956. Fox recognized how to combat television and the solution was blending unique content and technological novelty. In a 1956 demonstration of CS55, Fox said to the attendees that, "distributors and exhibitors know that the American public have their own theatres in their homes today and are receiving free entertainment; but they are willing to leave their home television sets to the motion picture theatres if better entertainment — with technical perfection — is offered."⁶⁶

The initiative to widen film had roots in the earlier generations, long before TV was officially introduced into the market. At first, television and motion pictures both utilized the same 1.33/7 aspect ratio that had long been standardized in film production in exhibition.⁶⁷ 1.33 gained traction early on as the shape for 35mm because it was used by innovator, Thomas Edison

⁶⁴ Kitsopanidou, 44.

⁶⁵ Belton, *Widescreen Cinema*, 83.

⁶⁶ "Demonstration Speech" dated January 9, 1956, "Carousel 1956" folder, Box 90, Sponable Papers.

⁶⁷ John Belton, Sheldon Hall, and Steve Neale, "Section I: History, Technology and Innovation," in *Widescreen Worldwide*, (Indiana: Indiana University Press, 2010), 5.

Note 1: "Perforations" are the holes along the film edge that sprockets poke through to advance the film in cameras, projectors and other playback equipment. With 35mm, each frame had four perforations along the film edge.

Note 2: "Aspect ratio" refers to the shape of the moving image. The aspect ratio "4:3" can be read as a fraction, or 4/3, which, when divided, comes out to 1.33. 1.33 means that the image is 1.33 times as wide as the height. In this aspect ratio, a 1 foot height would have a 1.33 foot width and an image with a 3 foot height would have a 4 foot width. As I explain later, film used a 1.33 aspect ratio when it was silent and then 1.37 with the standardization of the optical track. This change in shape is very slight, and some scholars conflate them by saying "1.33/7."

and his assistant, W. K. L. Dickson.⁶⁸ Writing in 2003, Rebecca Solnit says in *River of Shadows* that motion pictures "have been the same size, with the same spacing of the perforations" since the creation first emerged in 1889.⁶⁹ By the 1920s and 1930s, television's prototype development began to cause unrest for the film industry and the studios started to discuss pushing the boundaries of the frame. As referenced by John Belton in "Fox and 50mm" Fox Film Corporation's founder, William Fox, said in *Upton Sinclair Presents William Fox* (1933) that "the one thing that would make it possible to compete with television was to use a screen ten times larger than the present screen."⁷⁰ To some, the rationale for expanding the frame was purely aesthetic. Engineers A.S. Howell and J. A. Dubray wrote in 1930 in the *Journal of the Society of Motion Picture Engineers*, that the 1.33/7 aspect ratio "imposes doleful limitations on the artisans of the screen" and suggested that wider film would "provide a sufficient and adequate horizontal breadth to the screen image in order to approach more nearly the condition that the human eye meets in real life."⁷¹ However, television's commercial impact remained negligible during this earlier experimental stage, and it was not until the medium began seriously encroaching on film's box office after World War II that the project to increase the image's width finally gained momentum.

⁶⁸ Belton, *Widescreen Cinema*, 16.

⁶⁹ Rebecca Solnit, *River of Shadows*, (New York: Penguin Group, 2003), 231.

⁷⁰ Upton Sinclair, *Upton Sinclair Presents William Fox*, (Los Angeles, Upton Sinclair, 1933) 64. Note: cited in Belton, *Widescreen Cinema*, 11. quoted in Belton, "Fox and 50mm," 11.

⁷¹ A.S Howell and J.A. Dubray, "Some Practical Aspects and Recommendations on Wide Film Standards," *Journal of the Society of Motion Picture Engineers* 14, No. 1 (January 1930): 62 - 63.

CS55 Accelerators: Competition with Cinerama, VistaVision and Todd-AO

With American culture rapidly changing and theatrical attendance shrinking, the film industry set out to reclaim their box office by presenting moving images through means that vastly outperformed the technological limitations of TV. Though TV's size was small, its influence changed the shape of the film industry in big ways. In 1955, there were 32 million televisions in American homes, and at that point, television was causing serious financial trouble for the viability of the movie business.⁷² Belton explains that the movie business tried to recover from financial setbacks by resorting to "radically different spectatorial experiences,"⁷³ and this led to the development of widescreen images, large format film, and stereophonic sound. The new production and exhibition technologies helped the studios rebuild their audience, and their successes spurred on new internal competition for format dominance within the film industry.

Wider images weren't only a means to fight off the small screen - they also tapped into the spectacular nature of moving images. Kitsopanidou says that the industry's aesthetic experimentation was part of "the cult of magnification," which she explained was part of the desire to "transcend the conventions limiting the dimensions of the screen."⁷⁴ Belton and Kitsopanidou both invoke Andre Bazin's piece, "Myth of Total Cinema," when exploring the extraordinary nature of film. Bazin described this as an attempt to achieve "a perfect illusion of the outside world in sound, color, and relief," and it could take many forms.⁷⁵ Given that American audiences had new "leisuretime" needs, the artistic potential of moving image

⁷² Bohn and Stromgren, *Light and Shadows: A History of Motion Pictures*, 239.

⁷³ Belton, *Widescreen Cinema*, 69.

⁷⁴ Kitsopanidou, 41.

⁷⁵ Andre Bazin, "The Myth of Total Cinema," in *What is Cinema?* vol. 1, trans. Hugh Gray (Berkeley: University of California Press, 1967), 20. quoted in Belton, *Widescreen Cinema*, 2.

technologies could be tapped to explore this uncharted territory - the first system to truly create a shake-up, get audiences to turn off the TV sets, transform the medium of motion pictures, and allow film and TV to coexist was Cinerama. Other systems followed in subsequent years, with VistaVision in 1954 and Todd-AO in 1955.

Competition with Cinerama

The first Cinerama film was the travelogue, *This is Cinerama*, and it premiered at the Broadway Theatre in New York on September 30, 1952.⁷⁶ According to Belton:

Cinerama was a social phenomenon. Much as the advent of projection transformed the cinema from an individual, privatized experience into a public experience, Cinerama transformed the traditional movie theater into a revitalized site for shared experience in which viewers gained a heightened sense of their own participation in a mass phenomenon...unlike conventional narrative cinema, Cinerama was not so much passively "consumed" as it was actively experienced.⁷⁷

Although *This is Cinerama* was an instant success, grossing \$32 million on a \$1 million budget,⁷⁸ the technology was cumbersome and expensive. To achieve its widescreen images, Cinerama utilized three 35mm cameras for image capture and three projectors for projection, aiming three images to line-up side by side within the same plane on a wide screen. A fourth projector was utilized for a filmstrip with the seven channel stereo soundtrack. Installations cost between \$75,000 and \$140,000 and often led to smaller auditoriums with fewer seats as the projection booths needed to be dramatically enlarged to fit more projectors and equipment.⁷⁹ Cinerama showed that American audiences would leave their homes for spectacular

⁷⁶ Belton, *Widescreen Cinema*, 36.

⁷⁷ Ibid, 95.

⁷⁸ Ibid, 99.

⁷⁹ Ibid, 106.



[In the top row above are the three strips of film that comprise the Cinerama image. The three combined images were intended to approximate the image in the bottom row. Image from: Martin Hart, "Cinerama Wing," Widescreen Museum, accessed March 14, 2018. <http://www.widescreenmuseum.com/widescreen/winger1.htm>]

entertainment and “technical perfection,”⁸⁰ but its limitations and massive overhead prevented it from leading to an industry-wide adoption. However, Cinerama did forge a path for cheaper and more practical widescreen processes to follow - as the competition heated up, the widescreen wars were ignited. Kitsopanidou calls the era a "period of innovative outburst," explaining that "Cinerama proved to be a major reference point for all innovative activity of the American film industry of the 1950s and 1960s."⁸¹ By 1959, Cinerama had produced eight successful releases, which had grossed a total of \$82 million but could only be seen in twenty-two theaters.⁸² In contrast, by 1956, over 41,000 theaters around the world had been outfitted with 20th Century Fox’s special equipment for 35mm CinemaScope projection.⁸³

Competition with VistaVision

Introduced in 1954, Paramount's VistaVision was a widescreen system that utilized 35mm film and optical soundtrack. Though, instead of running the film through the camera vertically, it

⁸⁰ “Demonstration Speech” dated January 9, 1956, “Carousel 1956” folder, Box 90, Sponable Papers

⁸¹ Kitsopanidou, 49.

⁸² Belton, *Widescreen Cinema*, 99.

⁸³ *Ibid*, 106.



[Advertisement touting VistaVision's features. Image from: Paramount Pictures, "VistaVision: The Reason for the Superior Quality is the Size of the Negative!" advertisement, Digital Bits, accessed August 5, 2015, <http://www.thedigitalbits.com/columns/history-legacy-showmanship/to-catch-a-thief-60th>]

ran horizontally and took advantage of eight perforations of 35mm, instead of only four (see left). While horizontal VistaVision projectors were designed and installed in a total of and eleven theaters worldwide,⁸⁴ the system was not only intended for eight perf presentations. As Tom Vincent says in "Standing Tall and Wide: The Selling of VistaVision," Paramount's goal with the system was less about innovating a new exhibition technology and more about using "a larger camera negative and reducing it to fit standard 35mm [...] the resulting 35mm print would potentially be finer-grained have greater resolution than one that was created by conventional methods."⁸⁵ With VistaVision's negative being more than two and a half times the size of the picture area of 35mm,⁸⁶ according to Haines, "Fox noticed the quality of the VistaVision reduction prints," and sought to use a similar practice to minimize the graininess of their CS35

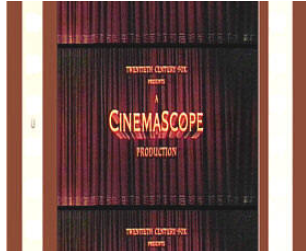
⁸⁴ Tom Vincent, "Standing Tall and Wide: The Selling of VistaVision," in *Widescreen Worldwide*, eds. John Belton, Sheldon Hall, and Steve Neale, (Bloomington, IN: Indiana University Press, 2010), 36.

⁸⁵ Vincent, "Standing Tall and Wide: The Selling of VistaVision," 28

⁸⁶ Vincent, 29.



[*Top left: color non-widescreen, 1.37 logo, 1939.* Image from: Top Left: "20th Century Fox" Riley's Logos Wiki, accessed March 14, 2018, http://rileyslogos.wikia.com/wiki/20th_Century_Fox. *Bottom Left: color CinemaScope 2.55 logo, 1953.* Image from: Martin Hart, "CinemaScope Page 8," Widescreen Museum, accessed March 14, 2018, <http://www.widescreenmuseum.com/widescreen/wings8.htm>. *Top Right: black and white non-widescreen 1.37 logo.* Image From: "20th Century Fox" Riley's Logos Wiki. *Bottom Right: black and white CinemaScope 2.55 logo, 1961.* Image from: "The Innocents," Putlockers, accessed March 14, 2018, <http://putlocker.io/watch/qvoVgodl-the-innocents.html>.]

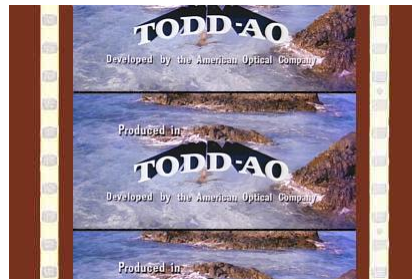


[*Opening logo from "The Robe" (1953).* On the left, the "compressed" images on the film frame - that this is how the images appear when observing the film without using playback equipment. On the right, the uncompressed images as they would look on screen. Image from: "Anamorphic Widescreen," Brooklyn Center Cinema, accessed, March 17, 2018, <http://www.brooklyncentercinema.com/scope/articles/anamorphic.htm>.]

prints.⁸⁷ The VistaVision negative was “2.68” times larger than standard 35mm and Fox attempted to increase this number for their experimentation.⁸⁸

Competition with Todd-AO

Introduced in 1955, Todd-AO utilized a five-perforation, 70mm film gauge and held six magnetic tracks for a stereo soundtrack. Unlike Cinerama, Todd-AO only used one strip of film at a time for capture and exhibition, and because the film gauge was larger than 35mm, it didn't require as much magnification in projection and could therefore reproduce an image that was



II I

I II

[Above is a 70mm film still with three sequential frames. Over the six “I’s” are the six magnetic tracks for stereophonic sound. The first two on the left and the last two on the right are indistinguishable in the image. Image from: Martin Hart, "70mm finally makes the big time, Page 11," Widescreen Museum, accessed April 4, 2018, <http://www.widescreenmuseum.com/widescreen/wingto11.htm>]

much sharper. Knowing that the industry would not quickly adopt the means to project this new format, Todd-AO used that to its advantage with the "roadshow" exhibition model, which treated shows more as events than as movie screenings. 70mm roadshows would only open at big theaters in major urban areas, charge higher ticket prices for assigned seats, and contain opening music and an intermission. The Todd-AO movies were filmed simultaneously in 70mm and

⁸⁷ Haines, 100.

⁸⁸ Vincent, 29.

35mm, and when the 70mm "roadshow" releases had run their course, the CS35 releases would follow in a greater number of theaters and territories. Todd-AO also developed a projector that could run 70mm and 35mm prints by swapping out parts, making the investment more appealing for exhibitors. The first Todd-AO release was an adaptation of the Rodgers and Hammerstein musical, *Oklahoma!* (1955) and was a big hit.⁸⁹ The system continued to be used for roadshows up through the 1960s.

CS55 Accelerators: Technical Issues with CinemaScope

Fox attempted to rebuild the audience that was being lured away by television and other widescreen systems by creating CinemaScope. Starting in December of 1952, the studio fast-tracked development on a new widescreen technology for 35mm film that incorporated "anamorphics" into motion picture lenses, which Cinerama, VistaVision and Todd-AO did not.⁹⁰ According to film historian Stephen Huntley's 1993 piece "Sponable's CinemaScope," anamorphic is a "Greek neologism, meaning *loss of shape*."⁹¹ The process bent light, allowing it to compress wide images into a roughly square frame, so that it "shrunk in on the sides like an accordion."⁹² When projected, CS35 uncompressed the image so that it filled a rectangular shaped screen. After the premieres of the first CS35 film, *The Robe*, the system quickly caught on because it was associated with a film that would eventually gross \$29.5 million in the US alone.⁹³ The system was promptly adopted by exhibitors, even though the lenses were rushed

⁸⁹ According to *Variety*, the film made \$7.1 million in the US and Canada alone. "All Time Domestic Champs," *Variety*, (January 6, 1960), 34.

⁹⁰ Beltson, *Widescreen Cinema*, 118.

⁹¹ Stephen Huntley, "Sponable's CinemaScope," in *Film History* Volume 5 (January 1, 1993): 300.

⁹² Huntley, "Sponable's CinemaScope," 300.

⁹³ Belton, *Widescreen Cinema*, 137.

into production and caused image distortion. The process also produced grainy images, which received complaints from Fox executives. Although CinemaScope was seen by exhibitors as “the ultimate answer”⁹⁴ to the TV problem, it required further refinement.

As part of the 35mm CinemaScope system, theaters did need new screens installed, but the projection booth could remain intact, with simple retrofits for new lenses and sound readers. The Bosch and Lomb anamorphic lenses projected in a 2.55:1 aspect ratio, which was nearly twice the 1.33/1.37 shape and cost “between \$1,800 and \$1,900,”⁹⁵ In order to fit that image width on 35mm prints, Fox modified the technology and the placement of the soundtrack. Instead of an optical soundtrack,⁹⁶ Fox utilized four thin strips of magnetic audiotape on the film that were placed inside and outside of the perforations [see images on page 28], and a magnetic sound reader was required for stereo playback. These basic equipment purchases provided practical improvements over the complex three projector Cinerama installations. Compared to the \$75,000 to \$140,000 range for Cinerama upgrades, Fox budgeted CinemaScope at \$10,000 for small theaters and \$25,000 for larger theaters.⁹⁷ Although CS35 rapidly grew in popularity,⁹⁸ the lenses had aberrations that would hurt its stability in the market as new systems were

⁹⁴ R.J. O'Donnell, “The Threshold of Great Things,” *Daily Film Renter* 5 (June 30, 1953) quoted in Belton, *Widescreen Cinema*, 133.

⁹⁵ Elgabri, 13.

⁹⁶ Note: Introduced in the 1920s, “optical tracks” were printed on film and because they were 3mm wide, they ate into the picture area on the film. Read & Meyers, 31.

⁹⁷ Lev, 169.

⁹⁸ Note: in 1953, there were 200 - 250 orders for CS35 equipment per week; 3,500 theaters were outfitted in 1954; and, in 1955, there were 13,500. From Belton, *Widescreen Cinema*, 136.

introduced.⁹⁹ In early lenses, the anamorphics were not perfected and the image failed to remain consistently in focus across the picture. As a result of the uneven compression, outer edges of the frame could be out of focus or characters sometimes looked disproportionally oversized.¹⁰⁰ Zanuck was disappointed with these issues and requested refinements that were “free from all distortions at the far edges and top and bottom of the screen.”¹⁰¹ Kitsopanidou says that into the mid-1950s CS35 was “increasingly losing its impact on the box office.”¹⁰² As Paramount unveiled their VistaVision system in 1954 and Magna introduced Todd-AO in 1955, Fox needed to return to the drawing board to maintain supremacy.

CS55 Brakes: Incoherent Marketing, Format Fatigue, and Poor Box Office

Fox addressed the ongoing external and internal economic crises and the technological issues with CinemaScope by giving birth to CinemaScope 55 - as TV sales continued to swell and VistaVision and Todd-AO threatened to outpace CS35, Fox went back to square one to invent a new and powerful motion picture technology. With CS55, Fox innovated a new 55mm gauge negative, anamorphic lens system, and customized playback equipment. Fox felt that CS55 offered many advantages over the other available widescreen technologies - Sponable said “in my opinion we have in our 55mm process the best motion picture medium devised to date.”¹⁰³ According to widescreen historian Martin Hart, even though the CS55 negative was not

⁹⁹ Kenyon C. Rosenberg and John S. Doskey, *Media Equipment: A Guide and Dictionary*, (Colorado: Libraries Unlimited, 1976), 61. Note: Kenyon C. Rosenberg and John S. Doskey define “aberration” in *Media Equipment: A Guide and Dictionary* as “the distortion of either the shape or color of an image caused by some failure in the design of a lens or an optical system.”

¹⁰⁰ Belton, *Widescreen Cinema*, 145.

¹⁰¹ “For Immediate Release” undated, in “Publicity - Promotional Packets” Folder, Box 109, Sponable Papers.

¹⁰² Kitsopanidou, 41.

¹⁰³ “Use of 55mm process for additional pictures” dated May 15, 1956, “Productions 1956 - 1957” folder, Box 105, Sponable Papers.

as wide as 70mm, since it was anamorphic, 55mm contained more visual information and could reproduce a sharper image.¹⁰⁴ Like with CS35, CS55 had 2.55 aspect ratio so venues would not need to purchase a new screen to exhibit it,¹⁰⁵ but in order to be adopted by the industry, exhibitors would need to purchase new projectors, lenses and magnetic sound readers. As opposed to the CS35 retrofits, major new equipment purchases were necessary to convert to CS55.

The CinemaScope 55 technology synthesized elements of all the preceding widescreen systems. Like Cinerama, CS55 emphasized spectacle and touted widescreen entertainment that couldn't be experienced in the home. According to one journalist who witnessed a trade screening, "55mm CinemaScope has real depth of focus; practically no grain [...] and no distortion, not even on the front row at the side."¹⁰⁶ As with VistaVision, CS55 was used partly as a capture medium that could be used to increase 35mm release print quality through reduction printing, which satisfied Zanuck, who agreed that the 55mm prints were "free from grain" and did not result in distorted images.¹⁰⁷ Fox also had an optical printer made that could cheaply mint reduction prints from a 55mm negative that was four times the picture area of 35mm, though Fox also wanted CS55 to exist on its own terms as a large format technology for roadshows, like with Todd-AO. According to Belton, Fox wanted CS55 to be "a wide film format that could be

¹⁰⁴ Note: when describing a 70mm print from a 55mm negative, Hart says, "A 70mm print from a 55mm negative is an optical REDUCTION, not a blowup." Martin Hart, "CinemaScope Wing," Widescreen Museum, accessed March 14, 2018. <http://www.widescreenmuseum.com/widescreen/wingcs6.htm>

¹⁰⁵ Note: According to a press release for *Carousel*: "It was not conceived as a means of projecting on a larger screen, although, of course, this could be done if desired." "Vital Statistics on *Carousel*" undated "Publicity - Promotional Packets," page 8, Box 109, Sponable Papers.

¹⁰⁶ "55mm CinemaScope," *Films in Review* quoted in Hart, "Films in Reveiw 55mm,"

¹⁰⁷ "For Immediate Release," Sponable Papers.

roadshown in select first-run houses."¹⁰⁸ As new widescreen systems were beginning to come and go, Fox assured exhibitors in CS55 promotions that "this equipment will not become obsolete...it is this company's intention to make at least one or more giant productions a year in this medium to be shown on this exclusive basis for long runs."¹⁰⁹ However, incoherent marketing, format fatigue, and poor box office applied brakes that quickly led to the death of CinemaScope 55.

CS55 Brakes: Incoherent Marketing

On June 19, 1956, in a memo to Fox's Executive Vice President, W.C. Michel, Sponable wrote with disappointment that if the studio wanted to continue using CinemaScope 55 for future productions, that unfortunately "it ought to be done under another name."¹¹⁰ From the start of CS55's lifespan, Fox's message to the public was misleading. At earlier stages in CS55's development, it was either going to be called, "CinemaScope 4x35" or "Super CinemaScope," but these labels were no less confusing - although they were attached to the system when it was still a prototype, they illustrate how Fox struggled to distinguish and convey the unique attributes of CS55. Fox's inability to clearly define and establish CinemaScope 55's identity was a major component of the system's untimely undoing - many at Fox felt that audiences had been "shortchanged"¹¹¹ by CS55 and that they didn't understand how it was different from CS35. As quoted by Belton, Sponable explained that "a large number of people knowing nothing about

¹⁰⁸ Belton, *Widescreen Cinema*, 154.

¹⁰⁹ "Launching of King and I" dated January 12, 1956, "King and I, The" Folder, Box 97, Sponable Papers.

¹¹⁰ Letter, dated June 19, 1956; Sponable Collection

¹¹¹ Ibid.

film dimensions, believe ‘55’ to refer to the year 1955.”¹¹² Fox touted the CS55 system and prepared it for implementation but was not always clear about how it was being used or changed throughout its development.

Fox began promoting CinemaScope 55 in 1955 and gave the public the impression that it would offer higher quality 55mm prints, though this was only one component of the system. As evidenced on page 28, the jump from 1.33/7 to 2.55 for CS35 is quite drastic - the doubling in width is easily perceptible from an audience standpoint. With CS55, the advantage was not



[Left: CS55 trade ad. Image from: 20th Century Fox, "CinemaScope 55: The New Dimension in Sight and Sound," Center: *Carousel* poster. Image From: 20th Century Fox, "Carousel," advertisement, Widescreen Museum, accessed March 23, 2017, <http://www.widescreenmuseum.com/widescreen/cs55ad.htm>. Right: *King and I* poster. Image From: 20th Century Fox, "King and I," advertisement, Widescreen Museum, accessed March 23, 2017, <http://www.widescreenmuseum.com/widescreen/cs55ad.htm>].

abundantly clear. On the *Carousel* and *King and I* posters, the CinemaScope 55 insignia was featured prominently, so they did want the technology to make an impact of the public.

¹¹² Letter, dated June 19, 1956, Sponable Collection quoted in Belton "Fox and 50mm" 21.

Carousel's said "CinemaScope 55 - more than your eyes have ever seen!" and *King*'s said "CinemaScope 55 - Richer! Deeper! Clearer!" The movie trailers for both CinemaScope 55 films made a more concerted effort to convey what the technology was capable of achieving. The narration in the *Carousel* trailer gave audiences background on the CinemaScope 55 technology and made an earnest attempt to legitimize it without using any footage from the film. Rodgers and Hammerstein were well-established by the mid-1950s and *Carousel* was a very successful stage musical,¹¹³ though the trailer focused solely on marketing the technology.¹¹⁴ From a close-up of the CS55 camera on a tripod, the trailer then cuts to a shot of Zanuck as he plays "show and tell" with 35mm and 55mm film strips and explains:

ZANUCK

Let me point out the difference between the old 35mm CinemaScope and the new 55mm CinemaScope. This is 35. This is 55. You will note that our new picture covers four times the area of the old film. What this means to you is that the sharpness of focus, the vast photographic field, the tremendous depth and the sense of audience participation have been improved beyond anything you have ever experienced in the theater.¹¹⁵

All of this would correctly imply that CS55 was a new film gauge that would offer improved picture quality, however it never explained a major component of the plan included 35mm reduction printing. Certainly, the print down process was not easy to explain, though Paramount was able to communicate this through promotional materials.

In the end, Fox abandoned CinemaScope 55 as an exhibition technology and Zanuck decided not to tell the public, which further blurred matters. According to an internal memo by Zanuck, he said in 1956:

¹¹³ "Carousel," Playbill, accessed January 23, 2018,

¹¹⁴ YouTube Movies, "Carousel 50th Anniversary Edition - Trailer," filmed [1955], YouTube video clip, 02:30, posted [August 4, 2014], <https://www.youtube.com/watch?v=iCDzuNa9Lv0>

¹¹⁵ "Carousel Movie Trailer," accessed 20 March 2017

There is no point in telling the public that we have 35mm prints as they are not interested in projection machines. Every advertisement and statement must say that *Carousel* will introduce for the first time the new 55mm CinemaScope. If we do this cleverly we will add millions to the gross of the picture. The fact that we can scientifically reduce it to a 35mm print is of interest only to the exhibitors and not the public.¹¹⁶

Even after that, Fox continued to make announcements that they would produce and release subsequent films in CinemaScope 55. After *Carousel*, in *Films in Review*, there was an announcement that “*The King and I* will be the first [CS55 release], and 55mm prints of this film should be unreeling in one theater in each of about 40 cities next September.”¹¹⁷ A month after *King and I* premiered, producer Samuel G. Engel said, “Although *Boy on a Dolphin* will be the third 20th Century-Fox film to be shot in the company's new CinemaScope 55 process, present plans are to make it the first to be released on 55mm film.”¹¹⁸ As was the trend - neither turned out to be true. Given that it was difficult to understand the technology, and that Fox did not prioritize transparency with the public, CinemaScope 55 did not make an effective bid for their audience.

CS55 Brakes: Format Fatigue

While Fox fully developed CinemaScope 55, the studio never implemented the exhibition technology, and this was partly because theaters experienced format fatigue as new systems and their upgrades continued to come and go. David Bordwell describes this phenomenon in his 2010 book, *Pandora's Digital Box*, saying:

Historically, most major film technology has been introduced in the production sector

¹¹⁶ Daryl Zanuck quoted in: Schawn Belston, “King and I: Introduction for a Restoration Premiere,” *Introduction Preceding a Screening of King and I at the Samuel Goldwyn Theatre*, Los Angeles, CA, August, 20 2004.

¹¹⁷ HH “55mm CinemaScope” quoted in Hart, “Films in Review 55mm”

¹¹⁸ Christian Appelt, “CinemaScope 55” in 70mm, accessed, February 17, 2017, <http://www.in70mm.com/news/2007/cinemascope55/de/index.htm>.

and resisted in the exhibition sector. Exhibitors have been right to be conservative. Any tinkering with their business, especially if it involves massive conversion of equipment and auditoriums, can be costly.¹¹⁹

Based on testimony in the trades, this observation was at play by exhibitors in the widescreen era. In 1955, engineer Alfred N. Goldsmith wrote in *Variety* that there were so many new motion picture technologies that “many a theater owner probably wakes up in a cold sweat surrounded by expanding and contracting Aspect Ratios, capering Sound Tracks and bobbing and weaving Optical Systems.”¹²⁰ Between the releases of *Carousel* and *King and I*, *Variety* wrote, “theater operators across the country are showing increased resistance *against any* technical changes affecting their pocket book[...] theaters urged 20th to release “King and I” in 35mm CinemaScope instead of CinemaScope 55, as originally planned.”¹²¹ In addition, according to historian Daniel J. Sherlock, theaters complained that Century's prototype dual 55mm/35mm projectors were difficult to use,¹²² and Sponable discouraged Fox from releasing any 55mm films until its bugs could be corrected. While Century's 55mm projectors were ready for deployment, exhibitors wanted a machine that could handle both formats. In February of 1956, Sponable said, “The designing and building of a 55/35 combination projector and associated equipment is a job that cannot be hurried too much.”¹²³ In the end, this machine that would have accommodated the needs of theaters was not delivered in time. Fox continued trying to develop a practical 55/35 machine with Century up through 1958, though according to Sponable, eventually “the project

¹¹⁹ Bordwell, 8.

¹²⁰ Alfred N. Goldsmith, “After Wide-Screen: What?” *Variety* (January 5, 1955), 28.

¹²¹ “Exhibits Tire of Costly ‘Toys’: Resist Buying ‘Better’ Gear” *Variety* (March 7, 1956), 7.

¹²² Daniel J. Sherlock, “Wide Screen Movies Corrections,” *Film-Tech*

¹²³ “55mm release of King and I,” dated February 1956, “King and I, The” Folder, Box 97, Sponable Collection.

was discontinued largely because of the company's 70mm activity."¹²⁴ While the continued emergence of new widescreen systems may have improved the presentation quality of motion pictures, at a certain point, theaters simply wanted to stop spending money on new equipment.

CS55 Brakes: Poor Box Office

Fox repurposed Zanuck's *Carousel* narration for the *King and I* teaser trailer with the addendum that CinemaScope 55 "was a revelation to all who saw and delighted in Rodgers and Hammerstein's *Carousel*."¹²⁵ Since *Carousel* was never screened in 55mm, the public never experienced the "revelation" that Fox suggested. While this further propagated myths about CS55, it also may have been written and recorded before *Carousel* was released - Fox issued *Carousel* in the US on February 16, 1956 and even though it only grossed \$3.75 million on a \$3 million budget,¹²⁶ Fox considered it a flop. Profitability on *Carousel* was vital. In a budget proposal from June 19, 1956, Sponable outlined the overwhelming expenditures on development of CinemaScope 55, showing that the sum of dollars spent plus those still needed to be spent to complete the project exceeded *Carousel*'s budget at \$3,568, 994.40.¹²⁷ According to Belton, "dismal box office returns on *Carousel* caused Fox to abandon" CS55 altogether.¹²⁸ Even if *Carousel* had been a success, the fact remains that it didn't premiere in CinemaScope 55, and this didn't bode well for the sustainability of the format in a competitive market.

¹²⁴ "55mm Equipment" in "Film + Equipment, 55mm - 1962," dated January 29, 1962, Box 95, Sponable Collection.

¹²⁵ FilmTrailersChannel, "King and I Trailer" YouTube video, filmed [1956], 02:13, posted [January 4, 2010], <https://www.youtube.com/watch?v=HvbZNxZFn-g>

¹²⁶ Aubrey Solomon, *20th Century Fox: A Corporate and Financial History*, (US: Scarecrow Press, 1988), 250.

¹²⁷ Letter, dated June 19, 1956, Sponable Collection.

¹²⁸ Belton, "Fox and 50mm," 20.

CinemaScope 55: Aftermath

In the aftermath of CinemaScope 55, Fox shifted their attention to other technological pathways for film production and exhibition - partly out of luck and partly as a survival strategy. In 1957, Panavision introduced an anamorphic lens that reproduced images that were far less distorted than those captured by the CinemaScope lenses.¹²⁹ Although Fox would wait until the late 1960s to begin using Panavision lenses, they became popular for productions from other studios. In 1959, Kodak introduced the Eastman Color negative Type 5250, which offered “better definition,” over their previous 35mm film stock so that the grain was no longer as visible or as distracting in magnification.¹³⁰ These technological innovations made improvements to 35mm without the need for CS55, though Fox had not completely scrapped large format film as a possibility for production and exhibition. In 1958, Fox became an investor in Todd-AO’s 70mm process, and Zanuck remarked that CS55 “may be almost as good as Todd-AO, but I doubt it greatly, particularly from the standpoint of the public.”¹³¹ By the close of the 1950s, a combination of other technologies successfully achieved and exceeded what CS55 initially set out to accomplish. Except for one surviving camera that was used on *Carousel*, all of Fox’s 55mm equipment was discarded.¹³²

Conclusion

Although Fox failed to distinguish CinemaScope 55 for the public, it was distinctly different from any other moving image technology of the widescreen era. In its drastic attempt to

¹²⁹ Belton, *Widescreen Cinema*, 155.

¹³⁰ Barry Salt, *Film Style & Technology: History and Analysis: Second Edition*, (London: Starwood, 1992), 242.

¹³¹ Letter, Zanuck to Michel, Sponable Collection quoted in Belton, *Widescreen Cinema*, 155.

¹³² Schawn Belston, Interview.

solve problems caused by competition from television, emergence of new widescreen systems, and the defects in CS35, CS55 created even more problems - though it was a powerful tool, the 55mm gauge was incompatible with any existing production and exhibition apparatus, and it failed to gain acceptance. CS55 was unfortunately much *too different* from the other widescreen systems, and Fox veered far off the norm because of extreme pressure. Unfortunately, unclear promotional materials, format fatigue, and weak box office led Fox to scrap their CS55 plans.

Between the release of *Carousel* and *King and I*, at a point when Fox was deciding whether to continue developing the technology or to abandon it, Sponable said "you will remember that the figure of 55mm (4 times area) was chosen largely on the grounds of competitive considerations, keeping in mind, as far as possible, the economics of the situation."¹³³ The economics and the competitive considerations of the widescreen wars accelerated radical experimentation that was intended to save an ailing industry - as Fox attempted to maintain their stature, they resorted to creating a unique new film gauge that diverted significantly from the longstanding 35mm film production and exhibition infrastructure. If CS55 caught on, it would have cemented Fox's reputation as an innovator, though among the widescreen systems that arrived in the 1950s, the only ones that survived, like Panavision and Todd-AO, worked with 35mm or utilized equipment that easily incorporated it.

¹³³ Letter, dated June 19, 1956, Sponable Collection.

Section 2: CinemaScope 55 History, Part II

The second section of this essay details Twentieth Century Fox's work preserving their films made with the CinemaScope 55 widescreen system. It starts with a brief overview of the functions of film archives, analyzes varying definitions of film preservation, and delves into a case study of the CS55 preservation project that occurred from 2003 to 2004. As the case study explains, the 55mm negatives for *Carousel* and *King and I* survive, but there are no longer mechanical resources to play them back. To utilize the elements, Fox's Vice President of Media and Library Services, Schawn Belston, worked with Cineric Labs' Director of Technical Operations, Simon Lund, to recreate components of the CS55 technology and then transfer them to more sustainable and accessible formats. My analysis of the case study is framed by Michelle Caswell's "social life of records" approach and Theodore R. Schellenberg's "primary values"/"secondary values" distinction, which I apply to explore the shifting contexts and new meanings that the negatives took on as archival records. The negatives were first used as the source for reproductions of the CS55 films, though once the technology reached its obsolescence, they became broken things with no utility. In the context of Fox's recent archival work, Belston says the studio wanted "to make sure that the library was safe," and set out to utilize "the best possible elements" as the source for their preservation work.¹³⁴ As the earliest generation and highest quality elements for the films, the CS55 negatives were used by Fox in this new context as a way to create authentic representations of *Carousel* and *King and I*.

When describing the preservation of works like *Carousel* and *King and I*, archival theorists frequently invoke medical metaphors, likening the function of moving image archives

¹³⁴ Rapfogel "Film Preservation."

to health care institutions as they bring at-risk films to a healthy state. From this perspective, movies made with obsolete technologies are at their “healthiest” when they are actively circulating because it means they have overcome the technological hurdles that threaten to render them inaccessible. According to Annette Melville and Scott Simmon, as preservationists strive to remedy a film’s health concerns, the end goal should be to make it accessible - they say, “preservation is incomplete without access to the preserved film.”¹³⁵ Considering that 35mm was still a common exhibition technology when Fox restored the films in the early 2000s,¹³⁶ they were able to preserve *Carousel* and *King and I* in that format, though some features had changed since the 1950s and needed to be tailored.

By looking at the lifespan of the CinemaScope 55 film elements, from their creation and up through the preservation process, it is possible to understand the ways that they continue to take on new meaning. In *Archiving the Unspeakable* (2014), Caswell says that archives are “not a stable entity to be tapped for facts but, rather, a constantly shifting process of re-contextualization.”¹³⁷ While Caswell draws on many theorists in her work, I highlight her incorporation of Gillian Rose’s “social life of visual objects”¹³⁸ approach and Frank Upward and

¹³⁵ Melville, *Film Preservation 1993*, x.

¹³⁶ 35mm remained a popular exhibition format until large scale, worldwide digital projection conversions in 2010/11. David Bordwell says “Shooting on digital media posed no threat to theatres as long the finished films were converted to 35mm prints for screening...In December 2000 the world had about 164,000 screens. Only thirty of them were digital. Five years later 848 were. At the end of 2010, however, 36,103 screens were digital—about thirty percent of the total. In North America, the jump was dramatic, from about 330 digital screens at the end of 2005 to over 16,000 at the end of 2010. By the end of the year [ed.2011], about 26,000 of America’s screens were digital—two-thirds of the total.” Bordwell, 8 - 10.

¹³⁷ Caswell, 13.

¹³⁸ Gillian Rose, *Visual Methodologies: An Introduction to the Interpretation of Visual Materials*, 2nd ed. (London: Sage, 2006), 216 quoted in Caswell, 14.

Sue McKemmish's "records continuum model."¹³⁹ Rose suggests perceiving visual materials "less as texts to be decoded for their meaning, and more as objects with which things are done."¹⁴⁰ In her own words, Caswell says that Rose provides tools for analyzing how images are "recontextualized and reimagined as they travel."¹⁴¹ Like Caswell and Rose, I am less interested in analyzing the content of *Carousel* and *King and I* and more concerned with the shifting perception of their "original" technical, material, and formal state. Looking at how the CS55 elements have transformed shows how visual materials don't remain static over time.

Upward and McKemmish use a "records continuum model" for analyzing the stages of an archival record's lifespan, which Caswell taps to trace the evolution of archival records. In Caswell's words, according to the RCM, it starts when a record is "*created*," then "*captured* as evidence," then "*organized* into personal or institutional archives," and then "*pluralized* as collective memory."¹⁴² From this view, archives serve as the custodians for artifacts, arriving at later stages in their lifecycle but they also ensure their accessibility and allow them to continue gaining new meaning as they age. Using Caswell's approach and building on writing by Rose, Upward, and McKemmish, I look at how materials that enter archives become disconnected from their intended uses and take on new roles.

Analyzing the shifting meanings of records is a major component of the work of the archivist, and Schellenberg provides a roadmap for this practice in "Appraisal of Modern Public Records." Schellenberg says that when records are initially created, they contain "primary

¹³⁹ Frank Upward, "Modeling the Continuum as Paradigm Shift in Record-keeping and Archiving Processes and Beyond," *Record Management Journal* (December 2000), n.p. quoted in Caswell, 13.

¹⁴⁰ Rose, *Visual Methodologies*, 219-220 quoted in Caswell, 15.

¹⁴¹ Caswell, 15.

¹⁴² Ibid, 13.

values,” and over time, they acquire "secondary values."¹⁴³ The primary value of an artifact is the intended value, which is generally commercial for motion pictures, and the secondary or unintended values are often historical, cultural or aesthetic. While Schellenberg’s thinking can be imposed on motion pictures, it is important to note that he is discussing the appraisal of government records - specifically “records that government agencies propose to destroy.”¹⁴⁴ Schellenberg suggests that “archivists should be empowered to review”¹⁴⁵ government records before they are discarded, and to archivist Anthony Cocciolo, the implication is that “records could be retained for reasons beyond the consideration of their original creators, including societal implications and other historic value.”¹⁴⁶ While government documents and motion pictures serve very different purposes at their inception and over time, they are both records and serve as evidence. To Cocciolo, records are “any data or information that is in a fixed form, such as information on a film reel, videotape, piece of paper, or computer file.”¹⁴⁷ Appraisal is an evaluation of that data and archivists are interested in extracting or analyzing it from records of all kinds. While I touched on the primary economic values of *Carousel* and *King and I* for their premieres in the previous section, this layer of value has largely been shed since their premieres. As corporate assets for Fox, the films will ideally remain profitable, though I am more interested here in the historical and cultural values that have come to be associated with the films.

¹⁴³ Schellenberg, "Nature of Archives," 16.

¹⁴⁴ Schellenberg, 32, quoted in Anthony Cocciolo, *Moving Image and Sound Collections for Archivists*, (Chicago: Society of American Archivists, 2017), 10.

¹⁴⁵ Schellenberg, 32 quoted in Cocciolo, *Moving Image and Sound Collections for Archivists*, 10.

¹⁴⁶ Cocciolo, 10.

¹⁴⁷ Cocciolo, 205.

In this section, I look at the changing social life, values, meanings and contexts for the CinemaScope 55 film elements. As corporate assets, the CS55 film elements were saved by the studio and held for safe keeping in their archive, even though they could no longer be used to make prints. Fox's preservation of their CS55 films provides a contemporary setting for the elements and allows them to continue finding a place within new settings for future audiences. In telling the story how *Carousel* and *King and I* were preserved I acquired testimony from Belston and Lund through articles and in-person interviews. In my analysis of the CS55 preservation project, I look critically at Belston's words, which are representative of dominant film archiving methodologies because they center on providing access to "authentic" versions of films. As this project exemplifies, when working with systems that are no longer serviced, preservationists must migrate content so that it conforms to current formats, though by reviving obsolete technologies to preserve *Carousel* and *King and I*, Fox pushed the interpretation of authentic preservation to its very limit.

Archive as Health Care

According to archival theory, film preservationists "extend the useful life"¹⁴⁸ of motion pictures, and this makes them like doctors, the films like patients, and film archives like hospitals. As an example, the New York Public Library's Preservation Division says, "Preservation can be compared to a health care system because it involves preventative, diagnostic, clinical, and critical care services."¹⁴⁹ If patients visit the hospital for a variety of reasons - routine check-ups, emergencies, or surgeries, for instance - then films enter the archive

¹⁴⁸ Annette Melville, "Preface" in *The Film Preservation Guide*, (San Francisco: National Film Preservation Foundation, 2004), vii

¹⁴⁹ New York Public Library, "NYPL Preservation Division," Barbara Goldsmith Preservation Division, accessed March 27, 2018, <https://www.nypl.org/collections/nypl-collections/preservation-division>.

in the same ways. Films may require temporary storage, urgent care, or reformatting.

Reformatting is preservation treatment that is akin to surgery, whereas something needs to be removed, replaced, or transitioned to a more sustainable form, and like the surgeon, the preservationist is the specialist that supervises the process.

Films can also enter archives when obsolescence renders them unplayable. In his aptly titled book, *The Death of Cinema*, film archivist Paolo Cherchi Usai writes that,

The profession of the film archivist is compared to that of a doctor easing his or her patients towards an unavoidable death: Moving image preservation will then be redefined as the science of its gradual loss and the art of coping with the consequences, very much like a physician who has accepted the inevitability of death even while he continues to fight for the patient's life...the conservator assumes the responsibility of following the process until the image has vanished altogether, or ensures its migration to another kind of visual experience, while interpreting the meaning of the loss for the benefit of future generations.¹⁵⁰

Even though the CinemaScope 55 negatives may have been in a near-death, comatose-like state once the technology became obsolete, they were eventually migrated “to another kind of visual experience,” so that they could continue to live a useful life. In this way, the need to visit the hospital, or in the case of motion pictures, the need (or privilege to be able to) enter the archive, is not always representative of a hopeless situation - within the field of film archiving, and specifically when combatting obsolescence, the goal is for the preservationist to ensure that motion pictures can leave the archive, continue circulating throughout society, and live a normal, healthy life.

¹⁵⁰ Paolo Cherchi Usai, *Death of Cinema: History, Cultural Memory, and the Digital Dark Age*, (London: British Film Institute, 2001), 105 quoted in Fossati, 121.

The Theory of Preservation Practice

Film preservation is both a concept and a series of activities. According to archival scholar Karen Gracy, defining preservation should be approached with “fluidity,” because the term is subject to much debate and investigation.¹⁵¹ In *Film Preservation: Competing Definitions of Value, Use, and Practice* (2007), Gracy devotes nearly 300 pages to “untangling the web of meanings”¹⁵² that can be associated with preservation, and ultimately summarizes it as “the effort to keep a film in viewable form.”¹⁵³ Gracy’s overview of preservation also incorporates two key concepts about authenticity and sustainability from guidelines in *Film Preservation 1993*, which was a collaborative work by Annette Melville and Scott Simmon for the Library of Congress. Gracy says, “when archivists talk of a film having been preserved, they usually mean that a series of procedures has been performed,”¹⁵⁴ and quoting *1993*, she says this ensures that a film is “(1) *viewable in its original* format with its full visual and aural values retained, and (2) protected for the future by ‘preprint’ material through which subsequent viewing copies can be created’.”¹⁵⁵ As evidenced by its widespread adoption and the continued discussion and analysis by thinkers like Gracy, the ideas in *1993* have provided a foundational understanding that archives build on when framing their preservation theory and work.

Some prominent film archiving theorists, such as Caroline Frick, do not completely embrace the notion of authenticity that is outlined in *Film Preservation 1993*. In *Saving Cinema:*

¹⁵¹ Gracy, 141.

¹⁵² Karen F. Gracy, *Film Preservation* (Chicago: Society of American Archivists, 2007), 142.

¹⁵³ Gracy, *Film Preservation*, 2.

¹⁵⁴ *Ibid*, 2.

¹⁵⁵ Melville, *Film Preservation 1993*, x.

The Politics of Preservation (2011), Frick looks at 1993 point “1” mentioned above in Gracy’s quote and asks, “In the twenty-first century, is the definition of what constitutes acceptable preservation standards still the most important priority for moving image collections?”¹⁵⁶ No, says Frick. She contends that maintaining authenticity is not the most important component of preservation and that there should be “a critical reappraisal of film preservation theory and method...[so as to consider] greater historical context...[and] empower a wider variety of individual participants in this dialog.”¹⁵⁷ Frick says that preservationists “take pride in technical, practical approaches to stabilizing film,” but that this is only one very limited component of the “intellectual theory” involved when maintaining a film’s legacy. Ultimately, while trying to represent films authentically through preservation is the dominant practice, not everyone agrees that authenticity is the most important value when reformatting films.

Despite the disagreements about preservation priorities, which tend to center on notions of authenticity, preservationists seem to agree that access is the ultimate goal of preservation. Even Frick says, “access itself is preservation.”¹⁵⁸ Gracy says that “many film archives have expanded their definition [of film preservation] so it is important that the effort creates new materials that can be viewed by future audiences and researchers.”¹⁵⁹ Ultimately, access feeds into the idea of bringing permanence to motion pictures. The Glossary of the Society of American Archivists defines access as “the characteristic of being easily reached or used with a

¹⁵⁶ Caroline Frick, *Saving Cinema: The Politics of Preservation*, (NY: Oxford University Press, 2011), 6.

¹⁵⁷ Frick, *Saving Cinema*, 7.

¹⁵⁸ Frick, 23.

¹⁵⁹ *Ibid*, 2.

minimum of barrier,”¹⁶⁰ and permanence as “the inherent stability of material.”¹⁶¹ Even if a moving image carrier had the stability to avoid degradation, it would still require playback technology to be serviced. Obsolescence is a looming threat to achieving moving image permanence, and it requires the preservationist to intervene so that materials can remain accessible.

Gracy’s approach to outlining preservation is flexible and inclusive and this is appropriate because every film has different preservation needs. It is therefore difficult to construct a definition that works for all situations or materials. As an example, 35mm film elements for films from the same era as CS55, won’t necessarily need to have playback technology rebuilt from scratch, but they may have other issues, such as their negatives may be lost or the elements may be too warped to safely run through a film printer. These scenarios all pose different barriers for access and permanence. Gracy acknowledges that her conceptualization is broad and says that the goals of film preservation can be vastly different depending on the type of institution, the institution’s needs, and the “supporting players” involved.¹⁶² In the case of *Carousel* and *King and I*, Schawn Belston said to me via in-person interview that the Fox archive wanted the preservation work on the films to be “as authentic as possible,”¹⁶³ and the studio set out to achieve this by printing 35mm prints and intermediate elements from the 55mm negatives.

¹⁶⁰ Society of American Archivists, “accessibility,” Archival and Records Terminology, accessed November 19, 2017 <https://www2.archivists.org/glossary/terms/a/accessibility>.

¹⁶¹ Society of American Archivists, “permanence,” Archival and Records Terminology, accessed November 19, 2017 <https://www2.archivists.org/glossary/terms/p/permanence>.

¹⁶² Gracy, 150.

¹⁶³ Belston, Interview.

CinemaScope 55: Determining the Original

If preservationists work to keep films in what Gracy calls a “viewable form,” then obsolescence makes this effort significantly more challenging. As technology changes, the preservationist must manage the tension between maintaining the usability of original elements and making new materials that can be circulated widely. In Penelope Houston’s *Keepers of the Frame* (1994), she explores the concept of preserving the “definitive version” of a film.¹⁶⁴ Houston says that the “objective” of film restoration is to “return a film as nearly as possible to its definitive form, if there ever was a definitive form which can be clearly established.”¹⁶⁵



[Top: uncentered 2.39 image; Bottom: preserved, letterbox image.
Image from: Cineric, "Restoring Cinemascope 55."]

According to Fossati, the process requires research - she says, “Copies are compared and differences are assessed, such as different soundtracks (e.g. multilingual or dubbed versions), different texts (e.g. re-edited or censored versions), and different image qualities (e.g. different

¹⁶⁴ Penelope Houston, *Keepers of the Frame* (UK: British Film Institute, 1994), 126.

¹⁶⁵ Houston, *Keepers of the Frame*, 126.

colors or different film stocks).”¹⁶⁶ This selection process is carried out in order for the preservation work to be authentic. In *The Past is a Moving Picture* (2012), Jana Jones says that the “contemporary archival community places a high value on artifactual authenticity,” and so in order to arrive at an authentic state, theorists argue that there must be strong traces of the original across the reformatted versions, even if the original is not easy to define or access.¹⁶⁷

For *Carousel* and *King and I*, the “original” forms are hard to identify and reproduce. The identification is complicated because multiple versions circulated and because there’s a disparity between what Fox initially wanted audiences to see and what was eventually released. The CS55 films were supposed to be exhibited in high quality 55mm prints, and although completed versions were privately screened for the press in this format,¹⁶⁸ the public never experienced either release in this way. Instead, they first saw both films in 35mm with a 2.55 aspect ratio and stereophonic soundtracks. Both films were eventually re-issued in cropped 2.35 versions, to accommodate the optical mono soundtrack on the film, and in this iteration, the image was no longer centered in the frame (see top image on page 52). *King and I* was also reissued in 70mm in 1961, and this edition was further cropped to 2.20.¹⁶⁹ In deciding what form the preserved films should take in complex situations like these, Fossati says that the original “can refer to the film as it was originally shown to the audiences.”¹⁷⁰ This approach is reflected in the work of Fox’s preservationist, Schawn Belston, because he prioritized replicating the essential technical

¹⁶⁶ Fossati, 119.

¹⁶⁷ Jana Jones, *The Past is a Moving Picture* (US: University Press of Florida, 2012), 53.

¹⁶⁸ “55mm CinemaScope,” *Films in Review* quoted in Hart, “Films in Reveiw 55mm.”

¹⁶⁹ Martin Hart, “CinemaScope, 7” Widescreen Museum, accessed March 14, 2018, <https://tinyurl.com/y8ofrr3r>.

¹⁷⁰ Fossati, 117.

features of the versions that were first screened publicly - Belston tells me that in 1956 Fox “made an optical reduction from 55mm to 35mm” and since the resulting 35mm prints “were the only way the movie was seen” for the initial release.¹⁷¹ However, reproducing the “original” is complicated because the original technology necessary to play back the CS55 negatives was discarded and because many technical attributes of 35mm film have shifted since the 1950s. Even though the 35mm format has changed since the middle of the twentieth century, when preserving *Carousel* and *King and I*, Fox still attempted to authentically reproduce the 2.55 aspect ratios and the stereophonic soundtracks of both films in new 35mm versions.

CinemaScope 55: Recreating the Original

Preserving archival film elements provides a bridge into the past, though Hollywood studios did not always consider the utility of their film libraries. In *Film Preservation 1993*, Melville and Simmon say that “Film studios traditionally captured their revenue from exhibiting new films,” because there was no market for what were perceived as “last year’s films.”¹⁷² Ironically, this all slowly began to change in the 1950s and 1960s - the same new medium that threatened to destroy the film industry eventually extended the lifecycle of motion pictures as Hollywood began consenting to broadcasting their back catalog on TV.¹⁷³ Melville and Simmon say that over time, “the advent of television brought a new market for some older sound films...

¹⁷¹ Belston, Interview.

¹⁷² Melville, *Film Preservation 1993*, 16.

¹⁷³ Note: Hollywood first licensed their theatrical releases for TV broadcast in the 1950s, though it wasn't until the early 1960s that they were offered in larger packages or that they became profitable. Michele Hilmes says, "And not until 1961 did the major networks finally feel secure enough in their profit structure to begin to incorporate regular screening of relatively recent Hollywood theatrical feature films into their schedules. NBC's Saturday Night at the Movies debuted on September 23, 1961 with a prime-time screening of *How to Marry a Millionaire* (1953) as the first of a package of 32 Twentieth Century-Fox feature films intended to fill up its first season on the air." Michele Hilmes, "Cinema and the Age of Television 1946 - 1975," in *The Wiley-Blackwell History of American Film: First Edition*, eds. Cynthia Lucia, Roy Grundmann, and Art Simon (US: Wiley-Blackwell, 2011), 600.

[and the eventual] growth of secondary markets over the past decade has reversed the industry's traditional revenue sources."¹⁷⁴ As films gained renewed and extended lifespans by being run on TV and eventually by getting released through other home entertainment markets, Hollywood studios began recognizing the value of conserving their deteriorating film libraries. While the practice of preserving studio collections had been well underway by the 1990s, the bridge between the commercial and the archival function of the studio back catalog was cemented at Twentieth Century Fox in in this era. At the time, Schawn Belston, then one of the studio's post-production engineers, convinced Fox's Chief Executive Officer, Bill Mechanic, to let him oversee their film archive. This decision dramatically enhanced the preservation activities at Fox by bringing authentic preservation practices into the studio's archival workflow. Historian Robert A. Harris describes Belston's career trajectory as it relates to Fox's revelations about their assets, saying:

[Belston] and his superior at the time, Ted Gagliano, shared a great admiration for the films of 20th Century Fox, and out of that passion a proposal for a preservation program was born. Bill Mechanic, studio head at the time, championed the program, and they were off and running - momentum that is built on today with support from the current corporate hierarchy.¹⁷⁵

In the context of a movie studio, motion pictures are their assets and preservation not only ensures that they can continue to be exploited - it also reinforces a connection to the past.

On returning to the past and also considering the future, Belston says that Fox is fully committed to the same authentic preservation practices that were gaining traction as he took over Fox's archive. As Melville and Simmon laid out in 1993, "film preservation requires comparison

¹⁷⁴ Melville, *Film Preservation 1993*, 17.

¹⁷⁵ Richard Harris, "Yellow Layer Failure, Vinegar Syndrome, and Miscellaneous Musings," The Digital Bits, accessed May 3, 2018, http://www.thedigitalbits.com/site_archive/articles/robertharris/harris031703.html.

of all surviving material on a given title, consultation of printed records of the production and exhibition history, and then decisions regarding the film's "original" state."¹⁷⁶ In a 2011

interview with Jared Rapfogel and Andrew Lampert, Belston echoes these sentiments, saying:

Over the past decade or so, Fox has invested significantly in making the best possible photochemical preservation elements on our feature film library, systematically inspecting and copying the best possible elements. It was very important to us to make sure that the library was safe, and that we would have elements available for future restoration.¹⁷⁷

In utilizing and making the "best possible elements," Fox has made a pledge to keep their library safe, and the preservation of *Carousel* and *King and I* are examples of this. Since their initial releases, both films have become harder to see in their "original" form. The initial 35mm-2.55 magnetic prints faded quickly,¹⁷⁸ and in their numerous re-releases, they were often presented in optical mono and with a cropped, uncentered 2.35 aspect ratio or with a 2.2 ratio for the 70mm release of *King and I*. The differences between the 2.55, 2.35, and 2.2 versions are slight, but they do represent deviations from the original as multiple versions appeared early in the films' life cycles.

The bulk of the original 35mm *Carousel* and *King and I* prints were not made directly off the 55mm negatives, and although 35mm intermediate printing materials - known as internegatives and interpositives¹⁷⁹ - survive for both *Carousel* and *King and I*, they were badly

¹⁷⁶ Melville, *Film Preservation* 1993, 6.

¹⁷⁷ Rapfogel and Lampert, "Film Preservation."

¹⁷⁸ Note: According to Read and Meyer, "Early chomagenic dyes, produced during the development of subtractive color film, were unstable and frequently lost both yellow and cyan, leaving a magenta image." Read and Meyer, 98.

¹⁷⁹ Note: The *Film Preservation Guide* (2004) defines "Intermediate" film elements as "Any film material created in the process of making a viewing print from original source material." From: National Film Preservation Foundation, *The Film Preservation Guide*, (San Francisco: National Film Preservation Foundation, 2004), 103.

faded, and therefore no preservation work was attempted from these elements.¹⁸⁰ Ultimately, given Belston's goal of working with "the best possible elements," he sought to go back to the original CinemaScope 55 negatives for what he considers to be an authentic preservation on these titles.¹⁸¹ The 55mm negatives for *Carousel* and *King and I* were not discarded when Fox purged their 55mm technology, though they were of no use unless CS55 machines could be located and repurposed.

In 2003, Cineric, a New York film lab that "specialized in unusual formats,"¹⁸² began corresponding with Belston about the prospect of working with CinemaScope 55. Cineric said



[Cineric's custom 55mm rollers. Photo by the author, September 1, 2017]

that the lack of existing CS55 machinery "leads to the current problem Fox has of two features that are an important part of their library in a film format that is obsolete and the only film element existing in 35mm is an interpositive made in the 60's of inferior quality."¹⁸³ Cineric suggested that their machine shop could design all the equipment to handle the nearly 50-year-old CinemaScope 55 elements. In their own words, Cineric "designed, engineered, and fabricated 55mm transport mechanisms and optical printer gates."¹⁸⁴

¹⁸⁰ Belston, Interview.

¹⁸¹ Ibid.

¹⁸² Simon Lund, Email message to author, March 10, 2017.

¹⁸³ Cineric, "Restoring Cinemascope 55."

¹⁸⁴ Cineric, Inc., "Company Profile," *Cineric, Inc.*, accessed April 24, 2018. <http://cineric.com/company-profile-2/company-profile-2/>.

Cineric was also able to provide other supporting equipment, which included, “film cores, split reels, synchronizers, a film cleaning machine, sprockets, and the most precise part manufactured, a 55mm liquid gate.”¹⁸⁵ The workflow would not include making new 55mm film or printing machines - instead, Cineric would need to adapt their equipment so that, like with the original releases, it could handle the 55mm materials and then print down to 35mm.

When the CS55 elements were sent to Cineric in 2003, the lab performed a detailed inspection and noted “shrinkage, fade, and rips, with opticals being slightly more faded,” on *King and I* and a fade so substantial on *Carousel* that photochemical work might not even be effective.¹⁸⁶ Though the inspection notes were not shocking, they did present logistical challenges for the machinists - Cineric would need to retrofit their optical printer to handle the 55mm negatives and continue to make slight adjustments along the way. An optical printer is the apparatus that is used to duplicate films, and the National Film Preservation Foundation’s *Film Preservation Guide* says that optical printing is a “laboratory process in which the image is projected through a lens and copied onto raw stock, frame by



[Cineric’s custom 55mm wet gate.
Photo by the author, September 1, 2017.]

¹⁸⁵ Cineric, Inc “Quotes for Preservation Work on Carousel and King and I” *Cineric, Inc.* October 3, 2003. From 20th Century Fox’s Archive in Library Services.

¹⁸⁶ Cineric, Inc “Quotes for Preservation Work on Carousel and King and I” *Cineric, Inc.*

frame.”¹⁸⁷ However, the shrunken acetate negatives meant that trial and error were required when creating the new custom film gate.¹⁸⁸ According to Read and Meyers, film with acetate bases shrinks over time because the solvent, water, and plasticizer that make up the material’s “stock characteristics” will evaporate over time.¹⁸⁹ As a result of the shrinkage, it took a full month for Cineric’s machinist to properly design a gate that would accommodate the film so that it would not be harmed in printing. In preservation, engineers sometimes use a “wet gate,” process, through which “film is temporarily immersed in a chemical bath, which helps to fill in scratches.”¹⁹⁰ Belston explains the wet gate as it applies to CS55, in more detail, saying that it is:

a pin registered film transport that advances the film one frame at a time through a chemical that hides any scratches that may be in the film. Getting one of these to work correctly with brand new film is hard enough but making one of that advances shrunken year 50 old film with non-standard perforations and large film area is an arduous task.¹⁹¹

Despite the material and mechanical challenges, modifying modern playback equipment was an essential step to using and recreating CinemaScope 55.

End Goal of Creating Access Through Available Technologies

Once Cineric’s optical printer was adapted, they were able to utilize the 55mm negatives and make new materials. From 55mm, Cineric struck intermediate elements and these served as the basis for new 35mm prints that maintained the original CinemaScope 55 2.55 aspect ratio. Belston also claims that improved modern 35mm prints are able to capture the

¹⁸⁷ NFPP, *Film Preservation Guide*, 105.

¹⁸⁸ Note: NFPP explains that a film gate is a “Mechanism in a camera, projector, or printer that holds the film strip.” NFPP, *Film Preservation Guide*, 103.

¹⁸⁹ Read and Meyers, 84.

¹⁹⁰ Ibid, 48-49.

¹⁹¹ Cineric, Inc “Restoring CinemaScope 55,” Cineric, accessed April, 22, 2018, <http://cineric.com/#2>.

sharpness of CS55:

While there is a lot of image area in the 55mm negatives, the film stocks of that era were primitive by today's standards. One reason Fox originally opted to go with the 55mm format was that the negative stocks were low-resolution and very grainy, and the larger image area compensated for that. With today's fine-grained film stocks, a contemporary 35mm negative can have the resolving power that the 55mm system had back then.¹⁹²

Even though Fox determined that the qualities of the original 35mm prints of *Carousel* and *King and I* were to guide the preservation work, Fox made two version of both films. Some copies were printed with a thin black bars at the top and bottom of the frame so that modern theaters that project the less wide 2.35 aspect ratio could support the full 2.55 frame.¹⁹³ For rare, specialized venues, the other copies were printed in the full 2.55 image ratio and utilized a digital soundtrack that was encoded between the perforations of the film to allow for extra image space. While these iterations were faithful to the aspect ratios of the original versions, they also included deviations that were necessary when conforming the restorations to the modern state of 35mm. Since 2.55 is no longer a supported ratio, Fox had to use ingenuity to fit it into the 2.35 frame with the letterboxing. Magnetic stereophonic sound is also no longer serviced for 35mm, and while the restored 2.55 prints held stereo tracks, they were presented in modern digital sound format. This is to say that neither of these iterations of *Carousel* or *King and I* existed when the films were first released. The films will ideally continue to be formatted for new technologies that emerge over time and may endure more slight adjustments.

¹⁹² Robert S. Birchard, "Restoring CinemaScope 55," *American Cinematographer*, accessed March 22, 2018, <https://theasc.com/magazine/june05/postfocus/page1.html>.

¹⁹³ Note: this is also known as a "letterbox," see page 52, bottom image.

Conclusion

By recreating the CinemaScope 55 technology, Fox wrote a new chapter in the lifespan of the *Carousel* and *King and I* film elements. Through the innovative engineering work of Cineric, the 55mm negatives were used to reproduce prints that Belston says are “100% better than I have ever seen.”¹⁹⁴ However, in their initial state, the elements served a different, more ephemeral purpose. In returning to the early stages of an archival record's existence, Caswell says, “any investigation of the social life of records must begin with the context of their creation.”¹⁹⁵ In the first phase of their lives, the CS55 negatives were a means to make innumerable facsimiles for wide circulation. They were mistreated and poorly handled in the process, and this is clear from Cineric’s inspection notes that identified “shrinkage, fade, and rips.”¹⁹⁶ Because the CS55 technology failed to catch on, the film elements entered a second stage where they served practically no purpose. The negatives were no longer an essential component of the identities of the films once the content was available in more practical and active formats, like 35mm, and they also had very little value for the studio. In 2004, Belston remarked to the L.A. Times that:

Since there was no interest or ability to deal with this material, when we opened the original negative cans, they were still wrapped in the original laboratory tissue papers from the 1950s. These cans hadn't been touched in almost 50 years.¹⁹⁷

When Fox later used the negatives in an archival context, they were no longer part of a multiplication effort - instead they became a singular and unique document that was integral to the identities of the CS55 films. As Schellenberg says “archivists should have the final

¹⁹⁴ Susan King, “Film restoration fit for a *King*” LA Times, accessed April 13, 2018, <http://articles.latimes.com/2004/aug/15/entertainment/ca-cinefile15>.

¹⁹⁵ Caswell, 157.

¹⁹⁶ Cineric, Inc “Quotes for Preservation Work on *Carousel* and *King and I*.”

¹⁹⁷ King, “Film restoration fit for a *King*.”

responsibility of judging the secondary values of records.”¹⁹⁸ To Fox, by making prints with the 55mm records as the source, the 35mm reduction copies were authenticated, as if they had a signature or a seal.

These transformative phases represent milestones in the archival life of the 55mm records, though once they were used to make what Belston tells me are “totally authentic”¹⁹⁹ representations of *Carousel* and *King and I*, this presented complications. This is because of obsolescence, which is a common thread in the CS55 life story. Obsolescence pushed the 55mm elements into their dormant, unhealthy second stage, it created mechanical challenges within the third stage, and it made the resulting preservation work less authentic as well. At the time that the films were preserved, exhibitors no longer showed 35mm prints in 2.55 aspect ratios and magnetic soundtracks were no longer serviced,²⁰⁰ so Belston had to give the films new forms that did not resemble the original versions that audiences consumed. The differences are subtle, though they bring into question how necessary it was to embark on such an “arduous task,”²⁰¹ as Belston describes it. Authenticity is a guiding principle for film preservation and Belston’s words are representative of literature in archival theory, though as obsolescence rules out the possibility of achieving genuinely authentic results, preservationists will necessarily perform interpretive work to create new possibilities for moving images.

¹⁹⁸ Schellenberg, 30.

¹⁹⁹ Belston, Interview.

²⁰⁰ Note: According to Daniel J. Sherlock, all of Fox’s CinemaScope prints began including a mono optical track after *Bus Stop* (1956), which was released a few months after *King and I*. Since the optical track was 3mm wide, it ate into the picture area on the film, and the aspect ratio was then cropped from 2.55 to 2.35. And, 35mm magnetic sound was eventually replaced in favor of optical “Stereo Variable Area (S.V.A.)” soundtracks, which appeared in the late 1970s. Daniel J. Sherlock, “Wide Screen Movies Corrections.”

²⁰¹ Cineric, Inc “Restoring CinemaScope 55.”

January 12th, 1

Messrs. W. C. Gehring
A. Silverstone
Alex Harrison
Glenn Norris

LAUNCHING OF "THE KING AND I".

Attached hereto is a list of theatres that I would like you or your Division Managers to contact immediately, with a view of ascertaining the following.

Commencing in September, we will release THE KING AND I in 32 cities on an exclusive roadshow basis in the original CINEMASCOPE 55 process.

Naturally, the shows will be launched in the order of the size of the cities, such as New York, Chicago, Los Angeles, Boston, Philadelphia, etc. etc., with the smaller cities following in sequence of importance.

First, you will have to ascertain whether the owners of the suggested theatres will be willing to purchase the necessary equipment consisting of special projectors, lenses, six channel sound where they do not have it (the sound will be on the film) and surround horns in the auditoriums where they do not have it installed presently.

Some of this equipment has not yet been completed. So, we are unable to give you a price, but I understand from Mr. Michel, head of our technical department, that it will run somewhere between \$25,000 and \$40,000.

The terms for the picture will be 70/30/10, we standing 70% of the advertising.

In each case the fixed operating expenses of the theatre shall be very carefully scrutinized and will have to be actual.

Also, a provision will be made to write off this equipment over a reasonable period. That part of the write-off that we arrive at, naturally, will be charged off on a weekly basis.

It must be borne in mind this equipment will not become obsolete at the end of THE KING AND I run because it is the company's intention to make at least one or more giant productions a year in this medium to be shown on this exclusive basis for long runs.

In the advertising we intend to announce that this picture will not be shown in the Metropolitan area of New York, nor the Metropolitan areas of the other cities in which the exhibition will be held, for a long time.

[Above: Original press materials for "King and I" which discuss CS55 obsolescence in the second paragraph from the bottom - 'this equipment will not become obsolete at the of THE KING AND I run.'
Image from: "Launching of King and I," Sponable Papers. Photo by the author.]

Section 3: Obsolescence

The third section of this essay looks at the obsolescence of moving image technologies and how it causes preservation to become a reformatting process. I first define obsolescence as it applies to film technology, then summarize theoretical understandings of obsolescence from the perspective of the moving image archiving field, and then use CinemaScope 55 as an example of how obsolescence impacts film preservation activities. The analysis of CS55 is framed by William Uricchio's "replacement" / "displacement"²⁰² model and Matilde Nardelli's perception that returning to obsolete technologies forms a "prolepsis."²⁰³ I use Uricchio's thinking to show that when film technology is *replaced*, reformatting allows the content to continue to exist, but it also *displaces* it from its original technology. I apply Nardelli's thinking to demonstrate that taking obsolete technology out of a film production and exhibition context and using it in the context of a work of art is similar to the work performed by the preservationist, which bridges the past and the present through decontextualization. As exemplified by CinemaScope 55, the obsolescence of film technology causes barriers for the continued access to and survival of moving image content, and in order for the information to continue to exist, the film preservationist must adapt it from unused technologies into active technologies.

Defining Obsolescence of Moving Image Technology

As a medium, motion pictures are machine-dependent. The *Glossary of the Society of American Archivists* says "machine-dependent" is "commonly used to describe software that can

²⁰² Uricchio, 99 & 104.

²⁰³ Matilde Nardelli, "Moving Pictures: Cinema and Its Obsolescence in Contemporary Art," 259.

run only on a specific type of hardware.”²⁰⁴ While the focus of this essay is on analog media, digital media also relies on hardware to run, and therefore preservation concerns for the computing field have implications for preservation of non-digital materials as well. In their *Guidelines on the Production and Preservation of Digital Audio Objects*, the International Association of Sound and Audiovisual Archives [IASA] says, "all technology, whether it be the hardware or software, formats or standards, will eventually change as a result of market forces, performance requirements or other needs or expectations."²⁰⁵ The rapid pace of technological change means that physical media and its corresponding recording and playback machines will eventually become obsolete. Obsolescence is defined by the Institute of Electrical and Electronics Engineers as a phenomenon that occurs when a technological “feature or requirement is no longer valid,” meaning that it will no longer be serviced or manufactured.²⁰⁶ Read & Meyers say that film incorporates a great deal of technology from vendors that comes and goes:

since the beginning of motion picture film, it is believed there have been over 100 commercial color systems, over 40 sound systems, at least 2,000 film laboratories world-wide, an unknown number of different film manufacturers and stocks and 100 years of innovations. A full list of all the pieces of evidence that could be useful is not possible and, indeed, does not exist.²⁰⁷

When moving image technology reaches its inevitable obsolescence, the information contained within the media is put at risk of becoming inaccessible for users.

²⁰⁴ Society of American Archivists, “machine dependent,” Archival and Records Terminology, accessed April 10, 2018, <https://www2.archivists.org/glossary/terms/m/machine-dependent>.

²⁰⁵ "6.1.5 Philosophy of System Sustainability," IASA-Web, accessed, May 23, 2017, <https://www.iasa-web.org/tc04/philosophy-system-sustainability>.

²⁰⁶ "1815-2012 - IEEE Standard for Electric Power Systems Communications-Distributed Network Protocol (DNP3)," IEEE Explore Digital Library, accessed November 18, 2017. <http://ieeexplore.ieee.org/document/6675752/>.

²⁰⁷ Read & Meyers, 55.

Theoretical Understandings of Film Preservation Within the Paradigm of Obsolescence

Critical literature in archival theory has not devoted enough space to the discussion of obsolescence. In the cases when it is approached, archival theorists explore how obsolescence is a force that limits the chances that a film will survive, and they also say that even if migration is an option, the form that the expression can take is limited by the features and attributes of existing technologies. To Fossati, who is one of the few theorists who writes about obsolete technologies outside of the context of digital preservation, obsolescence not only puts films at risk, it causes the representation of their formal features to change as they are reformatted.

Fossati says,

Film restoration is based on the best possible simulation of the original film artifact (where original is something in between the material artifact, as it has survived, and the idea of what it originally looked like), carried out using different technologies. The restorer can take his or her pick among available film stocks, printing and processing equipment.²⁰⁸

Fossati recognizes that “simulations” become more common as technologies become unavailable, and says that despite this challenge, “most archives can be associated” with the “film as original approach,” that is mentioned in the previous section.²⁰⁹

Gaby Wijers and Pip Laurenson are two film archivists who also discuss the paradoxes and challenges that obsolescence presents. Wijers recognizes the tension between the past and the future and suggests two approaches for the preservation of works that were produced with

²⁰⁸ Fossati, 142.

²⁰⁹ Ibid, 117.

obsolete technologies, which she describes as “purist/original technology” and “adapted/updated technology.”²¹⁰ Wijers says:

The first approach highly values the use of original technology and wants to preserve the work as it originally appeared. With this approach, the storage of old equipment and parts is key, and the lifecycle of the work is related and limited to the lifecycle of the equipment. The second approach highly values the use of new technologies and is known for the dynamic appearance of the work. With this approach, migration and emulation are essential, and the eventual loss of authenticity and historicity in relation to functionality and concept is part of the discussion about the possible strategies. Both approaches are valid but a suitable approach somewhere between these two has to be found.²¹¹

Wijer’s two approaches offer productive practical and theoretical solutions for handling obsolescence and weighing authenticity. Film archivist Pip Laurenson doesn’t address these exact two approaches but she agrees that there are a range of options for addressing obsolescence in preservation. She says that ultimately each work should be evaluated on a case by case basis and that decisions in the preservation process are categorized as “negotiated decisions” that continue to be discussed as time goes on.²¹²

Although the work is perceived slightly differently in the context of an art museum, obsolescence creates similar dilemmas for moving image preservation in a gallery context as it does in a theatrical setting. In the art world, films that screen as part of exhibits are considered “time based media,” which situates them more as sculptures with temporality as their major unit of measurement, and more and more, this includes non-analog media.²¹³ In “Media Art and the

²¹⁰ Gaby Wijers, “Obsolete Equipment: Ethics and Practices of Media Art Conservation” in *Preserving and Exhibiting Media Art: Challenges and Perspectives*, eds. Julia Noordegraaf, Cosetta G. Saba, Barbara Le Master, and Vincenzo Hediger, (Amsterdam : Amsterdam University Press, 2013), 235.

²¹¹ Wijers, “Obsolete Equipment: Ethics and Practices of Media Art Conservation,” 235.

²¹² Pip Laurenson, “Authenticity, Change and Loss in the Conservation of Time-Based Media Installations” *Tate Papers*, accessed November 26, 2017 <http://www.tate.org.uk/download/file/fid/7401>.

²¹³ Julia Noordegraaf, “Introduction,” in *Preserving and Exhibiting Media Art: Challenges and Perspectives*, eds. Julia Noordegraaf, Cosetta G. Saba, Barbara Le Master, and Vincenzo Hediger, has (Amsterdam: Amsterdam University Press, 2013), 11.

Digital Archive,” archival scholar Cosetta G. Saba says that like commercial works, time-based media is also “characterized by the coexistence of numerous different formats and devices.”²¹⁴ As technology changes, it is therefore more difficult to replicate works as they were originally displayed. Saba says that as technology evolves, the concept of authentic representation becomes less important because “in a digital environment...from a technical point of view, the distinction between “original” and “copy” has lost its meaning” but that this does impact the “integrity of the work.”²¹⁵ Wijers says that “the relationship between artistic intentions and technical equipment used is of crucial importance in the conservation of media art, where sustainability of artworks is threatened by an ever-shortening lifecycle of playback formats and equipment for playback and display.”²¹⁶ Saba and Wijers are saying that since moving images are produced using technology that is constantly shifting, reformatting is necessary but that this changes the nature of the work - this perception has implications for the films within museum and theatrical contexts.

Analysis and Conclusion

By applying William Uricchio and Matilde Nardelli’s views of obsolete technology to film preservation, it becomes clear how migration reshapes moving image content. Although Uricchio does not specifically refer to changes in moving image technologies, his “replacement” / “displacement” model has implications for film preservation. According to Uricchio, new technologies either replace old technologies, which makes the old

²¹⁴ Cosetta G. Saba “Media Art and the Digital Archive” in *Preserving and Exhibiting Media Art: Challenges and Perspectives*, eds. Julia Noordegraaf, Cosetta G. Saba, Barbara Le Master, and Vincenzo Hediger, (Amsterdam: Amsterdam University Press, 2013), 109.

²¹⁵ Saba, “Media Art and the Digital Archive,” 115.

²¹⁶ Wijers, 235.

“inconsequential or perhaps even forgotten,”²¹⁷ or new technologies displace old technologies, which puts the old “on a slow route of revaluation.”²¹⁸ CinemaScope 55 does not fit neatly into Uricchio’s model, but the technology did encounter different forms of “replacement” and “displacement” in different timeframes. CS55 was effectively used to produce *Carousel* and *King and I*, though it was used ineffectively to exhibit them, and this led the technology to become obsolete. The CS55 system became unnecessary and was eventually “replaced” as Kodak improved the sharpness of their 35mm film, Panavision introduced lenses with less distortion, and Fox invested in Todd-AO. Through the “replacement” process, the content of both films was “displaced” as they were disconnected from their 55mm origins and reformatted in 35mm, and in the case of *King and I*, eventually released in 70mm. When the CS55 technology was “adapted” and “updated” for preservation purposes, it was no longer competing in a market, but it was able to serve a useful purpose, so it can be argued that it was on a slow and delayed route to revaluation. As preservationists set out to bring films to a level of permanence, they attempt to maintain the functionality of obsolete technology in the process.

Unlike Uricchio, Nardelli does evaluate film in her exploration, though, like Wijers, Laurensen and Saba, she discusses time-based media, instead of commercial works like *Carousel* and *King and I*. Nardelli surveys works of art that utilize obsolete or near-obsolete film carriers and equipment as their main feature and says that this decontextualization and re-purposing of technology gives it new life and meaning.²¹⁹ Like the artworks that Nardelli explores, the CS55 apparatus was brought into a new setting and reanimated in order for the films to continue to be

²¹⁷ Uricchio, 101.

²¹⁸ Ibid, 101.

²¹⁹ Nardelli, 245.

seen. Cineric's custom rollers and liquid gate were not put on display with the preserved films or even needed to exhibit them, but they contributed to making them and allowed them to exist. I am not arguing for either of the CS55 films to be considered in the same context as time based media that screens in art galleries, but due to obsolescence, they were subject to the same "adaptation" and "updating." As Nardelli says, "it is not a matter of renewing the old via the new as, more or less explicitly, of providing ways for the new to be thought through the old."²²⁰ Although neither Uricchio nor Nardelli mention film preservation, their concerns and observations are relevant. As Wijers says, changes in moving image technology create an "ever-shortening lifecycle of playback formats and equipment for playback and display," and that preservationists strive for "sustainability" through updates and adaptations.²²¹ Both Uricchio and Nardelli look at how obsolete technology becomes more sustainable through repurposing and systems like CinemaScope 55 only continue to have utility if their utility evolves.

²²⁰ Ibid, 261.

²²¹ Wijers, 235.

FROM: 20th Century-Fox
444 West 56th St.
New York 19, N.Y.

THE HISTORY OF "THE KING AND I"

In 1944, author Margaret Landon wrote a strange but true account of an English school teacher's experiences in Bangkok. The title of the book was "Anna and The King Of Siam" and the work became an over-night best-seller. This autobiographical novel was to become the source of some of the greatest entertainment ever molded from a single literary work.

Early in 1946 Darryl F. Zanuck purchased the initial screen rights to the book, which resulted in the fine motion picture drama "Anna and The King of Siam." Under the Zanuck presentation aegis the film starred Irene Dunne, Rex Harrison and Linda Darnell. Filmed in black-and-white on a small screen the picture was produced by Louis D. Lighton and directed by John Cromwell.

The late Gertrude Lawrence became very excited about the story's possibilities for a musical and in 1952 her dream came true as she starred in Rodgers and Hammerstein's "The King And I" musical-comedy on Broadway. Opposite her in the "King" role was Yul Brynner.

In 1956 20th Century-Fox put the smash hit musical on the screen. Deborah Kerr starred as the schoolteacher and Brynner recreated his Broadway role. The picture was produced by Charles Brackett and directed by Walter Lang. The film received unanimous rave reviews.

The musical-comedy has been revived many times, the latest successful revival being last year at the New York City Center where Farley Granger and Barbara Cook had the lead roles.

Now the wonderful history of this bewitching tale receives the crowning touch as it is presented in the wonderful new motion picture medium of "Grandeur 70," bringing an even greater depth, clarity of image, a breathtaking new concept of color and a six-channel stereophonic richness of sound.

Composer Richard Rodgers sums up this historical culmination of "The King And I" in "Grandeur 70" by saying "This is the way we cinematically conceived it!"

#

[Above: At the bottom of this press release for the 70mm re-release of "King and I," composer Richard Rodgers implies that this version represents "the way we cinematically conceived it!" While it's not a definitive statement, it is confusing testimony about the authentic means to experience "King and I." Image From: The History of *The King and I*, undated, "Grandeur - The King and I" folder, Box 10, Sponable Collection]

Section 4: Authenticity

In this fourth section, I look at the concept of authenticity and its problematic application to the preservation of moving images. I first define authenticity as it applies to film preservation, which I am terming the *authenticity-based model*, and then use CinemaScope 55 as an example of how authenticity is a matter of interpretation. I frame the analysis of CS55 with Walter Benjamin's critique of authenticity in the context of photographs and film prints being duplicated for circulation and Giovanna Fossati's evaluation of authenticity in film preservation through her "film as original" framework. Benjamin says that with "a photographic negative, for example, one can make any number of prints; to ask for the 'authentic' print makes no sense."²²² Fossati looks critically at the preservation goal of "bringing an archival film back to a form that is as close as possible to the original,"²²³ which she says requires "interpretation to restore the original look of the work."²²⁴ The decision to rebuild the CS55 equipment allowed Fox to use the original 55mm negatives in their preservation of *Carousel* and *King and I*, though the rationale is difficult to rationalize.

Defining Authenticity for Motion Pictures

Film is a duplication medium - for exhibition and preservation - and some archival theorists discuss authenticity only as it applies to unique documents. According to the Society of American Archivists [SAA], a record that is seen as "original" is "considered to be the most

²²² Walter Benjamin, "'The Work of Art in the Age of Its Technological Reproducibility,'" in *Film Theory and Criticism*, eds. Gerald Mast and Marshall Cohen, (Oxford: Oxford University Press, 1979), 854 - 855 quoted in Fossati, 118.

²²³ Fossati, 71.

²²⁴ Ibid, 91.

authentic form of a document,"²²⁵ and "authenticity" is defined as being "the quality of being genuine, not a counterfeit, and free from tampering."²²⁶ Archival scholar Maria Guercio said in *Principles, Methods, and Instruments for the Creation, Preservation, and Use of Archival Records in the Digital Environment* that authenticity is the "recognition" that a document "has not been subject to manipulation, forgery, or substitution."²²⁷ Archival scholar Luciana Duranti said in *Diplomatics: New Uses for an Old Science* that authenticity means that a record is "duly vested with all necessary formalities."²²⁸ Within the context of moving image preservation, the perception is that the original version that audiences consumed contains these "necessary formalities" and the idea is to replicate them.

In *Film Preservation 1993*, Melville and Simmon say that preservation is "synonymous with duplication," so the evaluation of authenticity in moving image preservation is therefore slightly different than in other fields.²²⁹ In a sense, duplicating means making an illegitimate copy of an original because there is loss in the process. There is a case to be made that there is some "tampering" in the preservation process and that the results are less genuine with duplication. As preservationist Peter Copeland says, "Analogue recordings cannot be copied without some loss of quality."²³⁰ Copeland also says that when dealing with media that has a

²²⁵ Society of American Archivists, "original," Archival and Records Terminology, accessed April 10, 2018, <http://www2.archivists.org/glossary/terms/o/original>.

²²⁶ Society of American Archivists, "authenticity," Archival and Records Terminology, accessed April 10, 2018, <http://www2.archivists.org/glossary/terms/a/authenticity>.

²²⁷ Maria Guercio, "Principles, Methods, and Instruments for the Creation, Preservation, and Use of Archival Records in the Digital Environment," *American Archivist* 64:2 (Fall/Winter 2001).

²²⁸ Luciana Duranti, *Diplomatics: New Uses for an Old Science*. (US: Society of American Archivists and Association of Canadian Archivists in association with Scarecrow Press, 1998).

²²⁹ Melville, *Film Preservation 1993: A Study of the Current State of American Film Preservation*, x.

²³⁰ Peter Copeland, *Manual of Analogue Sound Restoration Techniques*, (UK: The British Library, 2008), 14.

limited lifespan, there are unavoidable trade-offs: "The strategy must therefore balance the inevitable losses against the financial costs of making the copy and the likelihood of the original surviving to another day."²³¹ As preservation is contingent on making copies, some things are lost in the process, and for this reason, the final product is arguably less authentic in nature.

Even within film preservation, there is disagreement about achieving authenticity. On the one side, Houston says that preservation gets a film "as nearly as possible" to its original form, and though she doesn't specifically mention them, to her, the process is judged by similar approaches used by Guercio and Duranti for unique documents. Laurenson disagrees and says that the notions of authenticity for unique documents can not be used to evaluate preservation of moving images. Laurenson says that moving images are "temporal and ephemeral" and therefore the conceptual framework of Guercio and Duranti "does not sit well."²³² Returning to and also expanding a Read and Meyers quote from earlier,

since the beginning of motion picture film, it is believed there have been over 100 commercial color systems, over 40 sound systems, at least 2,000 film laboratories worldwide, an unknown number of different film manufacturers and stocks and 100 years of innovations. A full list of all the pieces of evidence that could be useful is not possible and, indeed, does not exist. By definition, this also implies that certain identification is often not possible. In turn that means that truly authentic restorations are also not always possible.²³³

Ultimately, preservation work is interpretive and the theoretical perception of the practice is as well. By setting out to accurately replicate or faithfully duplicate a film through preservation, a preservationist is utilizing an *authenticity-based model*.

²³¹ Copeland, *Manual of Analogue Sound Restoration Techniques*, 17.

²³² Pip Laurenson, "Authenticity, Change and Loss in the Conservation of Time-Based Media Installations" *Tate Papers*.

²³³ Read & Meyer, 55.

Analysis and Conclusion

By using the writing of Benjamin and Fossati, it becomes clear how the effort to authentically preserve *Carousel* and *King and I* was interpretive work. When discussing duplication of artworks, Benjamin says that authenticity is “jeopardized by reproduction,” and that reproduction results in the “destruction of the aura” of an original.²³⁴ To Benjamin, “the reproduction, as offered by illustrated magazines and newsreels, differs unmistakably from the image.”²³⁵ Since the motion picture medium relies on reproduction, this calls into question what it means for a reproduction to be “authentic,” but it also means that preservation is partly the business of authenticating copies. For CinemaScope 55, returning to the 55mm negative for preservation is an attempt to impose authenticity on the project because there is a singularity to the “original” source negative in the same way that Guercio and Duranti perceive unique documents. However, there is also a strong case that any reproduction deviates from a sense of authenticity because it is a copy. While film preservationists are less interested in making “reproductions” for wide dissemination and more focused on ensuring long-term access to a work, the notion that they produce copies means that they move away from an authentic form of the work, and it calls any so-called authentic practice into question.

To Fossati, interpretation occurs at many levels for film, which she says is part of film’s “interpretive flexibility.”²³⁶ Fossati explains that, “as a complex technological artifact, film has always been the site of interpretive contestation,” and, for preservation, this means that motion

²³⁴ Walter Benjamin, "The Work of Art in the Age of Its Technological Reproducibility," 22.

²³⁵ Benjamin, 22.

²³⁶ Fossati, 155.

pictures require “interpretation to restore the original look of the work.”²³⁷ While Belston may have set out to authentically reproduce the “original look” of *Carousel* and *King and I* as they were first seen by audiences, he also took liberties with some values of the original and expressed them through duplication in ways that did not authentically resemble the original. As was discussed in detail in section two of this essay, steps were taken to maintain the full 2.55 aspect ratio and magnetic stereo soundtrack in new 35mm prints. However, the 35mm format had changed since the 1950s, and so the image needed to be letterboxed within a 2.35 frame and the soundtrack had to be made available digitally, instead of via magnetic stereo soundtracks. Additionally, as Belston explains, the sharpness of film grain improved significantly since the 1950s, and therefore, “a contemporary 35mm negative can have the resolving power that the 55mm system had back then.”²³⁸ Modern 35mm prints therefore have the potential to reproduce more visual information from the 55mm negatives than they did in the 1950s, meaning they could contain things that audiences did not see - or did not see in such great detail - when the films were initially released. Despite the intention to offer improved image quality through preservation, this outcome is not authentic to the 35mm reduction prints from 1956. As Paul N. Banks says, “conservation is interpretation,”²³⁹ and Fox’s interpretation of *authenticity-based* preservation led them to recreate *Carousel* and *King and I* with technology that did not exist when the films were originally seen by audiences.

²³⁷ Ibid, 91.

²³⁸ Birchard, “Restoring CinemaScope 55.”

²³⁹ Biddle, "Conservation in a Box: A Primer of Basic Paper Conservation Procedures and Treatments."

TWENTIETH CENTURY-FOX FILM CORPORATION

EARL SPONABLE

FUTURE 55MM PICTURES

It is desirable to estimate at this time the number of pictures you would like to photograph with the 55mm process during 1956 and if possible the number during 1957.

When the prototype equipment that we are now making is completed which is essentially a sample of each machine required in the process, we will be in the position to handle about two pictures per year. If you contemplate any larger number of pictures in 1957 we should think about the equipment requirements at this stage.

The current rushes on THE KING AND I represent in screen appearance about what we expected from the 55mm negatives reduced to 35mm prints.

The preliminary tests in the duping procedure are encouraging and it is likely that the general release of CAROUSEL can be printed from dupe negatives. We intend, however, to make a limited number of direct reduction prints, for instance about 25 or 30 for the initial theatre openings.

We are now designing a production printer to make direct reductions 55mm to 35mm. It is hoped enough of these can be built in time to use for the release of THE KING AND I.

We still believe that prints on the 55mm film with the six-hole frame will be a whole order of magnitude better than the 35mm reductions. For instance, 25 to 50% better. It is unlikely that we could have this equipment ready for showing the 55mm in theatres until sometime in 1957.

E.I.S.

[An internal memo from Earl Sponable discussing the future of CinemaScope 55. In it he mentions the challenges and factors that will cause delay in implementing the system.
Image From: "Future 55mm Pictures," undated "Sound - six-track 55mm composite release, etc 1956- 1959" folder, Box 113, Sponable Collection]

Section 5: Translation

In this fifth section, I explore how preservationists translate motion picture content across technological languages and into new contexts. I first summarize theory from linguistic anthropologist John Leavitt and other related fields to demonstrate that the translation process fundamentally alters source material. I then use Leavitt's theory to explore how *Carousel* and *King and I* were transformed into a modern 35mm language by Fox's preservationist, Schawn Belston. To Leavitt, when attempting to achieve "transference from one to another normal linguistic frame," he says that "full" translation is "impossible."²⁴⁰ If 35mm is one of film's many technological languages, then obsolescence makes components of that language unusable, which creates roadblocks for preservationists. Leavitt also explains that translation can't authentically represent its source because the outcome is inevitably tailored to "serve purposes that are defined by the target society."²⁴¹ Similar phenomena occurs in preservation because preservationists transform films to serve purposes defined by their target audience. I argue that Fox's preservation work on CinemaScope 55 exemplifies a *translation-based model*, which builds on linguistic theory and accepts that within the context of obsolescence there are technological limitations that require preservationists to perform interpretive work.

Saving Films That Are Lost in Translation

According to Leavitt's study of translation, authentically representing the complete range of meaning when moving content from its source to its target is a futile enterprise. To Leavitt, either "the original is thinned out" or it is "thickened up with material that wasn't there."²⁴²

²⁴⁰ Leavitt, 262.

²⁴¹ Ibid, 279.

²⁴² Ibid, 262.

Leavitt explores this concept by looking at a trajectory in translation studies that embraces the difference between source and target societies, and he uses this history to emphasize how translated works are interpreted and modified by the translator. For example, Leavitt references foundational anthropologist and linguist Franz Boaz and says that his “view of languages as coherent and different systems means that the analyst must not be satisfied with translation equivalents, nor take the possibility of glossing as proving that languages are *really* the same.”²⁴³ To Leavitt, translation is a means of linking two different, and sometimes incommensurable systems, and in the process, the translator creates something altogether new.

Leavitt’s work looks at how the intended meaning of a message can change through translation, which implies that message-creators are unable to continue maintaining authorship of their ideas once they are expressed. In part, this occurs because translators do not hold neutral positions. To Leavitt, once a message materializes, translators can then intercept, mediate, and modify it to meet the needs of their particular users. While this is not necessarily a negative outcome, translators such as Chukovskii have expressed dissatisfaction with the control that translators have over the meaning of a message: “Here is the chief tragedy of the art of translation: it often slanders the original author.”²⁴⁴ Leavitt explains that translation, “is always carried out *within* what has been called the target culture,” and he says that in translation studies, this style of modifying a message for a particular audience is known as “domesticating.”²⁴⁵ On the other side of the coin, there is “foreignizing,”²⁴⁶ which is a type of translation that seeks to

²⁴³ Ibid, 273.

²⁴⁴ Chukovskii, *The Art of Translation*, 48.

²⁴⁵ Leavitt, 279.

²⁴⁶ Severi and Hanks, “Translating Worlds,” 15.

maintain the essential or authentic elements of an original. Though, as Leavitt says “foreignizing translation serves purposes that are defined by the target society as much as does domesticating translation, or else one would not take it on.”²⁴⁷ Whether a translator attempts to authentically represent the original or create something new from the original, they are altering a message for their intended audience. This disconnection between the intended meanings of the source and the interpretation for the target highlights how a creator relinquishes control over their message and its reception.

According to literary theorist Roland Barthes, messages are highly manipulatable and creators relinquish control of their meaning at the transmission level. Barthes says “a text’s unity lies not in its origin but in its destination,” and that “the birth of the reader must be at the cost of the death of the author.”²⁴⁸ To Barthes, unintended interpretations and subsequent manipulations must be accepted by the creator. Literary critic Barbara Johnson says that to Barthes, losing the intentionality of a message is part of its lifecycle. Johnson says:

In his later essays, Barthes lays out a theory of literature based on a split between the classic notion of a *work (oeuvre)* - considered as a closed, finished reliable representation object - and the modern notion of a *text* - considered as an open, infinite *process* that is both meaning-generating and meaning-subverting. What interests Barthes is the *tension* between the concept of Literature and the concept of textuality...textuality is the manifestation of an open-ended heterogenous, disruptive force of signification that transgresses all closure.²⁴⁹

According to Barthes, once a message leaves the grasp of its creator, the original author can no longer remain its authority.

²⁴⁷ Leavitt, 279.

²⁴⁸ Roland Barthes, “The Death of the Author” in *Image Music Text*, ed. and trans. by Stephen Heath (New York: Hill and Wang: 1977), 148.

²⁴⁹ Barbara Johnson, “Writing,” in *Critical Terms for Literary Study: Second Edition*, eds. Frank Lentricchia and Thomas McLaughlin, (Chicago: University of Chicago Press, 1995), 40.

In a media context, as content is translated through what Jay David Bolter and David Grusin call “remediation,” messages gain new meanings as they are re-contextualized. Media theorists Bolter and Grusin define “remediation” as “the representation of one medium in another,” which can be thought of as reframing.²⁵⁰ Art theorist John Berger looks at the impact of reframing and says it ultimately serves as evidence in support of an argument by the reframer. Berger says:

When a painting is reproduced by a film camera it inevitably becomes material for the film-makers’ arguments. A film which reproduces images of a painting leads the spectator through the painting to the film-makers own conclusions. The painting lends authority to the film-maker.²⁵¹

This notion of reframing is also explored by sociologist Erving Goffman who pioneered the concept of “frame analysis.” To Goffman, the “frame” is a perceptual reference point for the receiver of a message, and it can serve to distort content. Goffman says, “these framings are subject to a multitude of different transformations.”²⁵² Historian Erica Westin says that, to Goffman, the frame “*quotes* the text or image within a context where it is assigned to a particular function.”²⁵³ As a translator “quotes” a text or image, they impose a frame on their message, and like the film preservationist, they create a frame within a frame.

Analysis and Conclusion

For Fox’s preservation work on *Carousel* and *King and I*, Schawn Belston acted as a translator, reformatting both films for audiences in the early 2000s. Preservationists don’t

²⁵⁰ Jay David Bolter and Richard Grusin, *Remediation: Understanding New Media* (Cambridge: MIT Press, 2000), 45.

²⁵¹ John Berger, *Ways of Seeing*, (New York: Viking Press, 1972), 26.

²⁵² Erving Goffman, *Frame Analysis*, (Cambridge: Harvard University Press, 1974), 499.

²⁵³ Monica Westin, “frame,” Chicago School of Media Theory, accessed, April 25, 2018, <https://lucian.uchicago.edu/blogs/mediatheory/keywords/frame-2/>.

typically view their work as translations and often claim that they are trying to respect the intentions of the filmmakers. For instance, in their Code of Ethics, the International Federation of Film Archives says, “When restoring material, archives [...] will not seek to change or distort the nature of the original material or the intentions of its creators.”²⁵⁴ Although “most”²⁵⁵ archives take this approach, as Fossati says, obsolescence requires content to become reframed and the originality of the source becomes distorted. While Belston’s testimony supports an authenticity-based approach, which seeks to faithfully “foreignize” films as they were originally seen, I argue that instead, the methods more closely resemble a translation-based approach, which advocates for “domesticating” films. Fox’s efforts to remain “authentic” were interpreted very literally as they attempted to recreate machinery to utilize the original 55mm negatives, though the studio unfortunately did not fully achieve this, as the resulting films needed to be altered to conform to their target format. A translation-based approach to preservation says that the intentions of the filmmaker become detached from their work as contexts and technologies change, and it also accepts that films are necessarily altered from their original forms as they are updated through reformatting.

While the technology to play back both CS55 films quickly reached its obsolescence, components of 35mm have also changed since, and this created barriers to authentically preserving the films. In Fox’s preservation of their CS55 films, the source material can be seen as the 55mm negatives and the target format can be understood as the recent 35mm prints. To faithfully reproduce CS55’s 2.55 aspect ratio, Fox “reframed” the images so they could fit within

²⁵⁴ FIAF, “Code of Ethics,” International Federation of Film Archives, accessed, May 1, 2018. <http://www.fiafnet.org/pages/Community/Code-Of-Ethics.html>.

²⁵⁵ Fossati, 117.

a less-wide 2.35 frame: the resulting preservation prints contained thin black bars at the top and bottom of the frame. Using Goffman's frame analysis, these preservations of *Carousel* and *King and I*, literally and figuratively reframed both films. In this sense, these new versions "quoted" the originals as the letter-boxing formed quotation marks. This reframing brought both films to audiences in 2004, and as technology and contexts continue to change, the CS55 films will need to continue to be translated.

December 23, 1955

RODNEY BUSH



OFFICE OF
W. C. GEHRING
EXECUTIVE ASST
GENERAL SALES MANAGER

TWENTIETH CENTURY-FOX FILM CORPORATION
HEAD OFFICE 444 WEST 56TH STREET, NEW YORK 19, N.Y.
BRANCHES IN ALL PRINCIPAL CITIES OF THE WORLD
TELEPHONE COLUMBUS 5-3320 CABLE ADDRESS: CENTFILM NEW YORK

January 3, 1956

We have finalized our plans for holding demonstrations of our new "CINEMASCOPE 55" in 59 cities including each of the United States Exchange Centers and Toronto, Ontario, in Canada.

"CINEMASCOPE 55" is a new and exciting reality for all of us! It is not merely an advanced technique in the photography and presentation of CINEMASCOPE, but a vital new process that will set a new standard in motion picture entertainment.

These demonstrations are for the express purpose of nationally publicizing this advancement in CINEMASCOPE -- a most important step for the benefit of our company and for the benefit of the entire Motion Picture Industry.

We must take every precaution to insure the success of every demonstration, from a technical and a selling point of view. We have a tremendous new process and I need hardly describe its worth or impact. I need only point to the columns and columns of unanimous acclaim that appeared in the trade press immediately following our demonstration as part of the National Allied Convention in Chicago last November.

This is our plan of operation for every demonstration. Read this basic letter and each of the several attachments very carefully. Your complete familiarity and understanding of this plan is the very first and most vital step in the achievement of our goal.

Each Branch Manager received a telegram yesterday asking him to establish definitely the theatre, the date and the time for those demonstrations in the cities in his branch area that had been selected as demonstration centers.

Our field publicity men have been advised of what part they are personally to take in connection with these demonstrations and I am enclosing herewith a copy of Rodney Bush's letter dated December 23rd to our field publicity men giving them proper instructions.

[Internal memo about Fox's "finalized" plans for CinemaScope 55

Image From: "Memo From W.C.Gehring," January 3, 1956, "Carousel 1956," folder, Box 90, Sponable Collection]

Conclusion

The Oxford English Dictionary defines preservation and obsolescence in the following ways: preservation is “a medicine or other agent that gives protection from disease or infection,”²⁵⁶ and it also means “to make lasting; to maintain or keep alive,” while obsolescence means “worn away, effaced, or eroded; worn out, dilapidated; atrophied; grown old, fallen into disregard.”²⁵⁷ If obsolescence is reached when a thing is overused or when a thing becomes useless, then preservation is an intervention or an interruption that tries to return a thing to its previously useful state. Preservation is an attempt to keep things as they are, while obsolescence means that things change or disappear. If obsolescence is death, then preservation is life - preservation offers a way to cheat death or to bring on reanimation if obsolescence has caused death. When obsolescence threatens to end the lifespan of a motion picture, film preservationists use ingenuity and creativity to save it, and with *Carousel* and *King and I*, Fox was able to recreate the disregarded CinemaScope 55 technology in order to keep both films alive.

CinemaScope 55 came about in the 1950s as motion pictures were being redefined. Up to that time, films were largely square-like when projected, and although the image on the television screen was this same shape, the new electronic medium offered audiences convenient access to media within the home. After World War II, this practical new context for moving images appealed to prosperous Americans, and the TV set quickly became a popular appliance. In response, the film industry desperately tried to create a spectacle that would propel audiences to return to the big screen. During the widescreen revolution of the 1950s, the big screen became

²⁵⁶ Oxford English Dictionary, "preservation," accessed, May 10, 2018, <http://www.oed.com/view/Entry/150719?redirectedFrom=preservation&>.

²⁵⁷ Oxford English Dictionary, "obsolete," accessed, May 10, 2018, <http://www.oed.com/view/Entry/129929?rskey=uzOmrP&result=1&isAdvanced=false#eid>.

even bigger, as the Cinerama, VistaVision, and Todd-AO technologies competed with television and with each other. These systems offered wider and clearer images than could be consumed via the TV set, and audiences were swept up in the immersive experiences. Twentieth Century Fox's CinemaScope caught on quickly because it was a cheap method for producing widescreen images through conveniently adapting the long-standardized motion picture technologies.

However, CS35 struggled to remain dominant due its lens aberrations and also due the appeal of other competing systems. Fox responded with CS55, which was a drastic deviation from existing motion picture apparatuses - it was a 55mm gauge film with all new production and exhibition equipment. CS55 was used to produce *Carousel* and *King and I*, though Fox never implemented the system in theaters. The marketing was confusing, exhibitors resisted the conversions, and *Carousel* was a flop, so Fox gave up on the technology and invested in other, more successful systems, instead.

In the early 2000s, Fox attempted to preserve *Carousel* and *King and I* from their original 55mm negatives. The studio was motivated to return to the original elements as part of the practice of "authentically" preserving a film, which began to gain widespread acceptance in the 1990s. While the film industry was initially panicked by the TV industry, TV and film eventually learned to co-exist. Films could be broadcast on TV after they left the theater, and this new medium and context for motion pictures meant that studios could continue to profit off of their releases if they preserved their libraries. Studio back catalogs continued to gain more importance as new media continued to emerge, and eventually, preservation became recognized as a means to celebrate the work as it was originally seen by audiences. As Fox's preservationist, Shawn Belston, attempted to protect the studio's motion picture library, the CS55 films presented

challenges for authentic preservation practices. The 55mm negatives survived for *Carousel* and *King and I*, though the mechanical resources did not, so the studio collaborated with Cineric Labs and rebuilt components of the technology so that the CS55 elements could be utilized to replicate the look of the original releases. The target format for the preservation was 35mm film, and although the project attempted to remain authentic, the end result was a hybrid of old and new technologies because 35mm had changed since the 1950s. When working with obsolete technologies, preservation necessarily becomes a reformatting process. The goal of remaining authentic is what led Fox to return to the 55mm elements, but they were not able to completely return to the forms that the films took when they were first released. Ultimately, the result is a translation because Fox had to conform the shape of the films to the particular features of 35mm film as it existed in 2004.

In "Re-Defining Film Preservation" from 1994, Annette Melville and Scott Simmon say that the "traditional" and "narrow" perception of preservation positioned it as being "synonymous with duplication."²⁵⁸ While film preservation is more than mere duplication, preservationists do ensure that old works will remain accessible by creating new copies that utilize current and available technologies. Within the paradigm of obsolescence, essential film technologies disappear, and much like an artist, this requires film preservationists to perform creative work in order to ensure that a motion picture will continue to survive. Within this tradition, the artist who adapts motion pictures for the big screen and the preservationist who adapts and updates works made with obsolete equipment are both utilizing moving image technologies in their respective

²⁵⁸ Annette Melville and Scott Simmon, Library of Congress, & National Film Preservation Board. "Redefining Film Preservation: A National Plan." (Washington, D.C.: National Film Preservation Board of the Library of Congress, 1994), accessed, December 1, 2016 <https://www.loc.gov/programs/national-film-preservation-board/preservation-research/filmpreservation-plan/redefining-film-preservation/>.

fields. The resulting manifestation that the preservationist creates resembles the original, but it is ultimately a new work in a new form - the effort is therefore a translated simulacrum and not an authentic clone of the original. In the case of Fox's CinemaScope 55 films, the studio's preservationist, Schawn Belston, did creative and interpretive work in the process of saving *Carousel* and *King and I*, and he created technologically innovative work, like the engineers who designed the CS55 system for the studio in the mid-1950s. Making movies and saving movies are located on the same continuum, and the CinemaScope 55 story brings this point sharply into focus. Although something is inevitably lost in the translation process, saving cinema by making new copies of a film is a gain for the preservation of motion picture heritage - as technologies change and films age, preservationists must continue brining moving images into a "new dimension in sight and sound."²⁵⁹

²⁵⁹ 20th Century Fox, "CinemaScope 55: The New Dimension in Sight and Sound."

BIBLIOGRAPHY

- "1815-2012 - IEEE Standard for Electric Power Systems Communications-Distributed Network Protocol (DNP3)." IEEE Explore Digital Library. Accessed November 18, 2017, <http://ieeexplore.ieee.org/document/6675752/>.
- "20th Century Fox." Riley's Logos Wiki. Accessed March 14, 2018, http://rileyslogos.wikia.com/wiki/20th_Century_Fox.
- "6.1.5 Philosophy of System Sustainability." IASA-Web. Accessed, May 23, 2017, <https://www.iasa-web.org/tc04/philosophy-system-sustainability>.
- "All Time Domestic Champs." *Variety*, January 6, 1960.
- "Anamorphic Widescreen." Brooklyn Center Cinema. Accessed, March 17, 2018, <http://www.brooklyncentercinema.com/scope/articles/anamorphic.htm>.
- "Equipment Required to Make 35mm Release Prints From '4x' Area Negative." Undated. "Super CinemaScope" folder. Box 113, Sponable Collection. (all citations from Sponable Collection are sourced through Columbia University Library)
- "55mm Equipment" in "Film + Equipment, 55mm - 1962." Dated January 29, 1962. Box 95, Sponable Collection.
- "Carousel." Playbill. Accessed, January 23, 2018, <http://www.playbill.com/production/carousel-majestic-theatre-vault-0000013229>.
- "Demonstration Speech." Dated, January 9, 1956. "Carousel 1956" folder. Box 90, Sponable Papers.
- "Exhibs Tire of Costly 'Toys': Resist Buying 'Better' Gear." *Variety*, March 7, 1956.
- "For Immediate Release." Undated. In "Publicity - Promotional Packets" Folder. Box 109, Sponable Papers.
- "Future 55mm Pictures." Undated. "Sound - six-track 55mm composite release, etc 1956- 1959" folder. Box 113, Sponable Collection.
- "King and I." Playbill. Accessed, January 23, 2018, <http://www.playbill.com/show/detail/4210/the-king-and-i>.
- "Memo From W.C.Gehring." Dated January 3, 1956. "Carousel 1956" folder. Box 90, Sponable Collection.

“Supplement to Memorandum of January 11 in re Super CinemaScope.” Dated January 20, 1955. “Super CinemaScope 1955” folder. Box 115, Sponable Papers.

“The History of The King and I.” Undated. “Grandeur - The King and I” folder. Box 10, Sponable Collection.

“Use of 55mm process for additional pictures.” Dated May 15, 1956. “Productions 1956 - 1957” folder. Box 105, Sponable Papers.

“Vital Statistics on Carousel.” Undated. “Publicity - Promotional Packets.” Box 109, Sponable Papers.

”55mm release of King and I.” Dated February 1956. "King and I, The" Folder. Box 97, Sponable Collection.

”Launching of King and I.” Dated January 12, 1956. "King and I, The" Folder. Box 97, Sponable Papers.

"The Innocents." Putlockers. Accessed March 14, 2018, <http://putlocker.io/watch/qvoVgodl-the-innocents.html>.

20th Century Fox. “CinemaScope 55: The New Dimension in Sight and Sound.” Advertisement. Widescreen Museum. Accessed March 23, 2017, <http://www.widescreenmuseum.com/widescreen/cs55ad.htm>.

20th Century Fox. "King and I." Advertisement. Widescreen Museum. Accessed March 23, 2017 <http://www.widescreenmuseum.com/widescreen/cs55ad.htm>.

20th Century Fox. "Carousel." Advertisement. Widescreen Museum. Accessed March 23, 2017, <http://www.widescreenmuseum.com/widescreen/cs55ad.htm>.

Appelt, Christian. “CinemaScope 55.” in 70mm. Accessed, February 17, 2017.

Barthes, Roland. “The Death of the Author.” In *Image Music Text*. Edited and translated by Stephen Heath. New York: Hill and Wang: 1977.

Bazin, Andre. "The Myth of Total Cinema." In *What is Cinema? vol. 1*. Translated by Hugh Gray. Berkeley: University of California Press, 1967.

- Belston, Schawn. "King and I: Introduction for a Restoration Premiere." Introduction Preceding a Screening of King and I at the Samuel Goldwyn Theatre. Los Angeles, CA, August, 20 2004.
- Belston, Schawn. Interview by the author. Tape recording. Los Angeles, March 14, 2017.
- Belton, John, Sheldon Hall, and Steve Neale. "Section I: History, Technology and Innovation." In *Widescreen Worldwide*. Indiana: Indiana University Press, 2010.
- Belton, John. "Fox and 50mm." In *Widescreen Worldwide*. Edited by John Belton, Sheldon Hall, and Steve Neale. Bloomington, IN: Indiana University Press, 2010.
- Belton, John. *Widescreen Cinema*. Cambridge, Mass: Harvard University Press, 1992.
- Benjamin, Walter. "'The Work of Art in the Age of Its Technological Reproducibility,'" in *Film Theory and Criticism*, edited by Gerald Mast and Marshall Cohen. Oxford: Oxford University Press, 1979.
- Benjamin, Walter. "'The Work of Art in the Age of Its Technological Reproducibility: Second Version.'" In *The Work of Art in the Age of Its Technological Reproducibility, and Other Writings on Media*, edited by Michael W. Jennings, Brigid Doherty and Thomas Y. Levin. Cambridge/London: The Belknap Press, 2008.
- Berger, John. *Ways of Seeing*. New York: Viking Press, 1972.
- Biddle, Michaelle. "Conservation in a Box: A Primer of Basic Paper Conservation Procedures and Treatments." Accessed, February 11, 2018. <https://works.bepress.com/mbiddle/2/>.
- Birchard, Robert S. "Restoring CinemaScope 55," American Cinematographer. Accessed March 22, 2018, <https://theasc.com/magazine/june05/postfocus/page1.html>.
- Bohn, Thomas H. and Richard L. Stromgren. *Light and Shadows: A History of Motion Pictures*. California: Mayfield Publishing Company, 1987.
- Bolter, Jay David and Richard Grusin. *Remediation: Understanding New Media*. Cambridge: MIT Press, 2000.
- Bordwell, David. *Pandora's Digital Box*. Madison, WI: Irvington Way Institute Press, 2012.
- Carr, Robert E. and R.M. Hayes. *Wide Screen Movies*. North Carolina: McFarland & Co, 1988.
- Caswell, Michelle. *Archiving the Unspeakable*. Madison, Wisconsin: University of Wisconsin Press, 2014.

- Chukovskii, Kornei. *The Art of Translation*. Translated by Lauren G. Leighton. Knoxville, University of Tennessee, 1984.
- Cineric, Inc. "Company Profile." Cineric, Inc. Accessed, April 24, 2018.
<http://cineric.com/company-profile-2/company-profile-2/>.
- Cineric, Inc. "Quotes for Preservation Work on Carousel and King and I." Cineric, Inc. Accessed, October 3, 2003. From 20th Century Fox's Archive in Library Services.
- Cineric, Inc. "Restoring CinemaScope 55." Cineric. Accessed, April, 22, 2018
<http://cineric.com/#2>.
- Cineric. "Restoring Cinemascope 55." in70mm. Accessed, February 20, 2018.
http://www.in70mm.com/news/2005/cinemascope_55/index.htm.
- Cocciolo, Anthony. *Moving Image and Sound Collections for Archivists*. Chicago: Society of American Archivists, 2017.
- Copeland, Peter. *Manual of Analogue Sound Restoration Techniques*. UK: The British Library, 2008.
- Daniel J. Sherlock. "Wide Screen Movies Corrections." Film-Tech. Accessed, January 20, 2018.
<http://www.film-tech.com/warehouse/tips/WSMC20.pdf>.
- Duranti, Luciana. *Diplomatics: New Uses for an Old Science*. US: Society of American Archivists and Association of Canadian Archivists in association with Scarecrow Press, 1998.
- Elgabri, Ali Zaki. "First Two Years of CinemaScope: A Thesis Submitted in Partial Satisfaction of the Requirements for the Degree Master of Arts in Theater Arts." Masters thesis, University of California - Los Angeles, 1964.
- FIAF. "Code of Ethics." International Federation of Film Archives. Accessed, May 1, 2018.
<http://www.fiafnet.org/pages/Community/Code-Of-Ethics.html>.
- FilmTrailersChannel. "King and I Trailer." YouTube video. Filmed [1956]. 02:13. Posted [January 4, 2010]. <https://www.youtube.com/watch?v=HvbZNxZFn-g>.
- Fossati, Giovanna. *From Grain to Pixel*. Netherlands: Amsterdam University Press, 2009.
- Frick, Caroline. *Saving Cinema: The Politics of Preservation*. NY: Oxford University Press, 2011.

- Goffman, Erving. *Frame Analysis*. Cambridge: Harvard University Press, 1974.
- Goldsmith, Alfred N. "After Wide-Screen: What?" *Variety*, January 5, 1955.
- Gracy, Karen F. *Film Preservation*. Chicago: Society of American Archivists, 2007.
- Guercio, Maria. "Principles, Methods, and Instruments for the Creation, Preservation, and Use of Archival Records in the Digital Environment." *American Archivist* 64:2 Fall/Winter 2001.
- Haines, Richard. *Technicolor Movies: The History of Dye Transfer Printing*. Jefferson, North Carolina: McFarland & Co, Inc., 1993.
- Harris, Richard. "Yellow Layer Failure, Vinegar Syndrome, and Miscellaneous Musings." The Digital Bits. Accessed May 3, 2018. http://www.thedigitalbits.com/site_archive/articles/robertharris/harris031703.html.
- Hart, Martin. "70mm finally makes the big time, Page 11." Widescreen Museum. Accessed, April 4, 2018. <http://www.widescreenmuseum.com/widescreen/wingto11.htm>.
- Hart, Martin. "CinemaScope Wing, Page 6." Widescreen Museum. Accessed, March 14, 2018. <http://www.widescreenmuseum.com/widescreen/wingcs6.htm>.
- Hart, Martin. "CinemaScope Wing, Page 7." Widescreen Museum. Accessed, March 14, 2018. <http://www.widescreenmuseum.com/widescreen/wingcs7.htm>.
- Hart, Martin. "CinemaScope Wing, Page 8." Widescreen Museum. Accessed, March 14, 2018, <http://www.widescreenmuseum.com/widescreen/wingcs8.htm>.
- Hart, Martin. "CinemaScope 55." Widescreen Museum. Accessed March 23, 2017. <http://www.widescreenmuseum.com/widescreen/cs55ad.htm>.
- HH. "55mm CinemaScope." *Films in Review*, December 1955.
- Hilmes, Michele. "Cinema and the Age of Television 1946 - 1975." In *The Wiley-Blackwell History of American Film: First Edition*, edited by Cynthia Lucia, Roy Grundmann, and Art Simon. US: Wiley-Blackwell, 2011.
- Houston, Penelope. *Keepers of the Frame*. UK: British Film Institute, 1994.
- Howell, A.S, and J.A. Dubray, "Some Practical Aspects and Recommendations on Wide Film Standards." *Journal of the Society of Motion Picture Engineers* 14, No. 1, January 1930.

- Huntley, Stephen. "Sponable's CinemaScope." In *Film History* Volume 5, January 1, 1993.
- Johnson, Barbara. "Writing." In *Critical Terms for Literary Study: Second Edition*. Edited by Frank Lentricchia and Thomas McLaughlin. Chicago: University of Chicago Press, 1995.
- Jones, Jana. *The Past is a Moving Picture*. US: University Press of Florida, 2012.
- King, Susan. "Film restoration fit for a King" LA Times. Accessed April 13, 2018, <http://articles.latimes.com/2004/aug/15/entertainment/ca-cinefile15>.
- Kitsopaniidou, Kira. "The Widescreen Revolution and 20th Century Fox's Eidophor in the 1950s." In *Film History* 15, 1, 2003.
- Laurenson, Pip. "Authenticity, Change and Loss in the Conservation of Time-Based Media Installations." Tate Papers. Accessed, November 26, 2017, <http://www.tate.org.uk/download/file/fid/7401>.
- Letter, Zanuck to Michel. Dated October 23, 1958. "Zanuck" folder. Box 116, Sponable Collection.
- Letter, Zanuck to W.C. Michel. Dated November 13, 1958. "Zanuck" folder. Box 116, Sponable Collection.
- Letter. Dated June 19, 1956. "55mm" folder. Box 109, Sponable Collection. Columbia University Libraries.
- Lev, Peter. *Twentieth Century-Fox: The Zanuck-Skouras Years, 1935 - 1965*. Austin: University of Texas Press, 2013.
- Marleau-Ponty, Maurice. *Phenomenology of Perception*. Translated by Colin Smith. London: Routledge & Kegan Paul, 1962.
- Melville, Annette and Scott Simmon, Library of Congress, and National Film Preservation Board. "Redefining Film Preservation: A National Plan." National Film Preservation Board of the Library of Congress. Accessed, December 1, 2016. <https://www.loc.gov/programs/national-film-preservation-board/preservation-research/filmpreservation-plan/redefining-film-preservation/>.
- Melville, Annette, Scott Simmon, Library of Congress, and National Film Preservation Board. *Film Preservation 1993: A Study of the Current State of American Film Preservation*. Washington, D.C.: National Film Preservation Board of the Library of Congress, 1993.

- Melville, Annette. "Preface." In *The Film Preservation Guide*. San Francisco: National Film Preservation Foundation, 2004.
- Nardelli, Matilde. "Moving Pictures: Cinema and Its Obsolescence in Contemporary Art." In *Journal of Visual Culture* Volume 8 Issue: 3, December 2009.
- National Film Preservation Foundation. *The Film Preservation Guide*. San Francisco: National Film Preservation Foundation, 2004.
- New York Public Library. "NYPL Preservation Division." Barbara Goldsmith Preservation Division. Accessed, March 27, 2018. <https://www.nypl.org/collections/nypl-collections/preservation-division>.
- Nietzsche, Frederick. "1888." In *The Portable Nietzsche*. Edited by Walter Kauffman. New York: Viking Press, 1954.
- Noordegraaf, Julia. "Introduction." In *Preserving and Exhibiting Media Art: Challenges and Perspectives*. Edited by Julia Noordegraaf, Cosetta G. Saba, Barbara Le Master, and Vincenzo Hediger. Amsterdam: Amsterdam University Press, 2013.
- O'Donnell, R.J. "The Threshold of Great Things." *Daily Film Renter* 5, June 30, 1953.
- Oxford English Dictionary. "obsolete." Accessed, May 10, 2018. <http://www.oed.com/view/Entry/129929?rskey=uzOmrP&result=1&isAdvanced=false#eid>.
- Oxford English Dictionary. "preservation." Accessed, May 10, 2018. <http://www.oed.com/view/Entry/150719?redirectedFrom=preservation&>.
- Paramount Pictures. "VistaVision: The Reason for the Superior Quality is the Size of the Negative!" Advertisement. Digital Bits. Accessed, August 5, 2015, <http://www.thedigitalbits.com/columns/history-legacy-showmanship/to-catch-a-thief-60th>.
- Rapfogel, Jared and Andrew Lampert. "Film Preservation." In *Cineaste* Vol. 36, Issue 4, Fall 2011.
- Read, Paul and Mark-Paul Meyers. *Restoration of Motion Picture Film*. Boston: Butterworth Heinemann, 2000.
- Rose, Gillian. *Visual Methodologies: An Introduction to the Interpretation of Visual Materials*. 2nd Ed. London: Sage, 2006.
- Rosenberg, Kenyon C. and John S. Doskey. *Media Equipment: A Guide and Dictionary*. Colorado: Libraries Unlimited, 1976.

- Saba, Cosetta G. "Media Art and the Digital Archive." In *Preserving and Exhibiting Media Art: Challenges and Perspectives*. Edited by Julia Noordegraaf, Cosetta G. Saba, Barbara Le Master, and Vincenzo Hediger. Amsterdam: Amsterdam University Press, 2013.
- Salt, Barry. *Film Style & Technology: History and Analysis: Second Edition*. London: Starwood, 1992.
- Sargent, Ralph. *Preserving the Moving Image*. US: Corporation for Public Broadcasting and the National Endowment for the Arts, 1974.
- Schellenberger, T.R. "Nature of Archives." In *Modern Archives*. US: Kansas State Historical Society, 1998.
- Severi, Carlo and William F. Hanks. "Translating Worlds: The Epistemological Space of Translation." In *Translating Worlds: The Epistemological Space of Translation*. Edited by Carlo Severi and William F. Hanks. Chicago: Hau Books, 2015.
- Sinclair, Upton. *Upton Sinclair Presents William Fox*. Los Angeles, Upton Sinclair, 1933.
- Society of American Archivists. "accessibility." Archival and Records Terminology. Accessed November 19, 2017 <https://www2.archivists.org/glossary/terms/a/accessibility>.
- Society of American Archivists. "permanence." Archival and Records Terminology. Accessed November 19, 2017 <https://www2.archivists.org/glossary/terms/p/permanence>.
- Society of American Archivists. "authenticity." Archival and Records Terminology. Accessed, April 10, 2018, <http://www2.archivists.org/glossary/terms/a/authenticity>.
- Society of American Archivists. "machine dependent." Archival and Records Terminology. Accessed, April 10, 2018, <https://www2.archivists.org/glossary/terms/m/machine-dependent>.
- Society of American Archivists. "original." *Archival and Records Terminology*. Accessed, April 10, 2018, <http://www2.archivists.org/glossary/terms/o/original>.
- Solnit, Rebecca. *River of Shadows*. New York: Penguin Group, 2003.
- Solomon, Aubrey. *20th Century Fox: A Corporate and Financial History*. USA: Scarecrow Press, 1988.
- Upward, Frank. "Modeling the Continuum as Paradigm Shift in Record-keeping and Archiving Processes and Beyond." *Record Management Journal*, December 2000.

- Uricchio, William. "Replacement, Displacement, and Obsolescence in the Digital Age." In *Cultures of Obsolescence*, edited by Babette B. Tischleder and Sarah Wasserman. New York: Palgrave Macmillan, 2015.
- Usai, Paolo Cherchi. *Death of Cinema: History, Cultural Memory, and the Digital Dark Age*. London: British Film Institute, 2001.
- Vincent, Tom. "Standing Tall and Wide: The Selling of VistaVision." In *Widescreen Worldwide*, edited by John Belton, Sheldon Hall, and Steve Neale. Bloomington, IN: Indiana University Press, 2010.
- Westin, Monica. "frame." Chicago School of Media Theory. Accessed, April 25, 2018. <https://lucian.uchicago.edu/blogs/mediatheory/keywords/frame-2/>.
- Wijers, Gaby. "Obsolete Equipment: Ethics and Practices of Media Art Conservation." In *Preserving and Exhibiting Media Art: Challenges and Perspectives*. Edited by Julia Noordegraaf, Cosetta G. Saba, Barbara Le Master, and Vincenzo Hediger. Amsterdam: Amsterdam University Press, 2013.
- Winston, Brian. "How Are Media Born?" In *Media Studies: A Reader, 2nd edition*. Edited by Paul Marris and Sue Thornham. New York: NYU Press, 2000.
- YouTube Movies. "Carousel 50th Anniversary Edition - Trailer." Filmed [1955]. YouTube video clip. 02:30. Posted August 4, 2014. <https://www.youtube.com/watch?v=iCDzuNa9Lv0>