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ARCHIVAL CLUES:
FILM, DIGITAL, AND THE EVIDENTIAL PARADIGM

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FOR MY FAMILY
AND IN MEMORY OF FRANCESCO

Habent sua fata libelli.
Walter Benjamin, “Unpacking My Library”

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Abstract

This dissertation examines the evidentiary value of film materials according to the epistemological model designed by Carlo Ginzburg in his essay "Clues. Roots of an Evidential Paradigm." By "film materials" I mean the physical rolls of film conserved in archival vaults, as carriers of material clues that cannot be retrieved anywhere else, not even in their digital versions. I argue that such objects can be read as documents and as such used as primary sources for historiography. This operation, which requires a particular kind of archival expertise, can be of additional support to more traditional archival research. My goal is that of integrating film archival practices, with particular attention to the digital preservation of analog moving images, with broader theoretical frameworks in film studies.

In my first chapter, I explore the practice of digital preservation of analog moving images in light of recent theoretical discussions on the ontology of digital cinema. I argue that digital preservation changes the status of the digitized analog films, which are transformed from objects of use into archival objects. This changed status is at the core of my second chapter, where I show the evidentiary potential of film as an archival object, triggered by the practice of digital preservation as well as by broader discourses surrounding the obsolescence of analog media. In my third chapter, I provide an example of the evidentiary potential of film by examining a group of films in an Italian collection belonging to a Catholic production and distribution company active in Italy from 1938 until the 1980s.

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Introduction

Film and the Evidential Paradigm

Singularity is almost invariably a clue.
Arthur Conan Doyle, "The Boscombe Valley Mystery"

In an ancient Asian fable, three brothers meet a man who has just lost his camel. The brothers deny having seen the camel, but are able to describe it to the man in minute detail; for this reason, they are accused of theft, arrested and brought to trial. In their defense speech, they demonstrate how they were able to reconstruct the appearance of the camel from a myriad small traces it had left in the woods where they met the man. In the meantime, the camel is found, unmistakably proving the innocence of the brothers, who are triumphantly released. This story, whose origin has never been positively identified, has undergone numerous iterations in the course of history.[1] The most famous and influential version is to be found in the third chapter of Voltaire's *Zadig*, where the eponymous protagonist is able to reconstruct the appearance of the King's horse and the Queen's bitch from the traces they left on the ground, and is therefore accused of theft and arrested. Much like in the oriental fable, Zadig exculpates himself to the

1 The history of its versions has been reconstructed by Régis Messac in his massive study *Le "Detective Novel" et l'influence de la pensée scientifique* (1929) (Paris: Encrage, 2011).

judges by recounting out-loud the mental process that enabled him to describe the look of two animals he had never seen.[2] It is in this episode and in the way in which it constructs a path toward knowledge that Carlo Ginzburg, in his essay "Clues: Roots of an Evidential Paradigm," locates not only the embryo of the mystery novel, but also the most essential narrative embodiment of a broader epistemological model that would emerge in the humanities in the nineteenth century, and that he calls the evidential paradigm.[3]

With this project, I intend to investigate the potential of the evidential paradigm for the study of film. The issue of film as evidence is a long-standing one, and has been explored mainly from the perspective of the indexicality of the photographic image. In the Bazinian tradition of cinematic realism, a photograph is a trace of whatever was in front of the camera when the photograph was taken; it is by virtue of its nature as trace (or index), it can and has been argued, that a photograph can function as evidence.[4] This tradition has been renewed and challenged in recent years because of the emergence of digital audiovisual technologies, which, according to a considerable number of scholars, do not possess the indexical value of the photographic image,

2 Voltaire, *Zadig* (1747), in *Candide and Other Stories*, trans. Roger Pearson (New York: Oxford University Press, 1998).

3 Carlo Ginzburg, "Clues: Roots of an Evidential Paradigm," in *Clues, Myths and the Historical Method,* trans. John and Anne C. Tedeschi (Baltimore: The John Hopkins University Press, 1989), 105.

4 This tradition originates of course with André Bazin's "The Ontology of the Photographic Image," in *What Is Cinema? Vol. 1,* trans. Hugh Gray (Berkeley: University of California Press, 1967), 9-16. However, Bazin never uses the term "index" to designate the photographic trace; the first scholar to establish a connection between Bazin and Charles Peirce's semiotic system was Peter Wollen in "The Semiology of the Cinema," in *Signs and Meaning in the Cinema* (Bloomington: Indiana University Press, 1969), 116-154. It should also be noted that, although I am referring to the indexical value of photography and film without differentiating between the two, some scholars believe that there is a substantial difference between the nature of the photographic and the cinematic trace – see, for instance, Roland Barthes, *Camera Lucida*, trans. Richard Howard (New York: Hill and Wang, 1981).

be it moving or still.[5] However, although I will consider the issue of digital indexicality in the first part of my dissertation, throughout my project I will shift the focus from the evidence provided by the photographic image to the evidentiary value of films themselves as material objects, and will investigate how this value is affected by the advent of digital technology.

After elaborating on the consequences of the digital shift on the material nature of film, I will explore how the evidential paradigm can be helpful for the investigation of the evidentiary potential of film objects, and the kind of knowledge that such an inquiry can produce. By "film objects" I mean the physical rolls of film as carriers of historical clues that cannot be found anywhere else. Such clues can be divided in two broad categories. The first pertains to the film object as the embodiment of a set of technological peculiarities that are not reproducible: chemical composition of the film stock, type of emulsion, edge codes, size and shape of the perforations.[6] The second pertains to the traces that history left on the film object: splices, scratches, notes written on the leader, mechanical and/or chemical damage to the film base or emulsion. My argument is that film objects can be read as documents, and that such an operation can be of additional support for the historical research carried out in traditional archives and lead to a more comprehensive knowledge of historical facts. At the core of my research stands the idea that, in order to investigate issues of evidence and materiality in film, it is fundamental to adopt an archival perspective and to include an analysis of archival practices into the theoretical exploration of the ontology of cinema. The film archive is the place where the objects that make

5 For an overview of some of the different perspectives on the issue of indexicality, trace, and digital technology, see the special issue of *differences: A Journal of Feminist Cultural Studies* 18.1, *Indexicality: Trace and Sign*, eds. Mary Ann Doane (2007).

6 Edge codes are series of symbols printed on the edge of a film strip. They contain information pertaining to the manufacturer of the film stock.

up the history of cinema are conserved, and where the evidential paradigm can be an invaluable epistemological framework for investigating the materiality of film from both a theoretical and a historical perspective.

The Evidential Paradigm and the Writing of History

According to Carlo Ginzburg, the evidential, or conjectural, paradigm is an epistemological model that emerged towards the end of the nineteenth century in the humanities, which is based on "the deciphering of signs of various kinds, from symptoms to writing."[7] This model finds "its justification in the denial that reality is transparent" and in the concurrent faith in the existence of "privileged zones – signs, clues – which allow us to penetrate it."[8] The conjectural paradigm implicitly assumes that the world is made up of a mixture of significant and contingent elements, and is based on the faith that this mixture is legible – or, to put it differently, that it is possible to distinguish meaning from contingency. Implicit in the functioning of this model is the primacy of perception over intellectual reasoning: "Sight […] became the privileged function of those disciplines excluded from the suprasensorial eye of mathematics."[9] For this reason, disciplines that are based on this paradigm are founded on the scientific knowledge of the individual as singularity; it is the realm of the human sciences, as opposed to that of mathematics, which sacrifices the knowledge of individual elements in favor of generalization. Clues are not particular manifestations of a general and immutable rule, but

7 Ginzburg, "Clues," 95.
8 Ibid., 95-96; 112.
9 Ibid., 103.

rather the perceptual points of entry into an individual phenomenon, be it a literary text, a work of art, or the psyche of a human being, as in the case of psychoanalysis. Conversely, the distinction between a clue and a contingent element is dependent on the perception of the observer, rather than being an intrinsic characteristic of the world.

The story I recounted at the beginning of this introduction is a perfect narrative example of how the evidential paradigm functions. In Voltaire's version, Zadig's explanation of the clues that allowed him to reconstruct the appearance of the Queen's bitch is the key moment in the episode, and it is worth reporting in its entirety:

> I was out walking near the little wood where I subsequently met the venerable eunuch [looking for the dog] and the most illustrious Master of the Hunt [looking for the King's horse]. I saw some animal tracks in the sand, and I could easily tell that they were those of a small dog. Long, shallow grooves drawn across tiny heaps of sand between the paw-marks told me that it was a bitch whose teats were hanging down, which meant that she had whelped a few days previously. Other traces going in a different direction, and apparently made by something brushing constantly over the surface of the sand beside the front paws, told me that she had very long ears. And as I noticed that the sand was always less indented by one paw than by the other three, I realized that the bitch belonging to our most august Queen had, if I may dare say so, a slight limp.[10]

After this description, Zadig gives a similar explanation of how he was able to reconstruct the appearance of the King's horse from the traces it left in the woods. In both cases, Zadig's speech is a perfect example of the functioning of the evidential paradigm. Each trace left by the dog is a clue that helps determine its physical characteristics. Those traces were visible to anyone, but only Zadig was able to isolate them from the continuum of the world and see them as meaningful – or, in other words, to see them as clues rather than contingent elements. At the same time, it was the encounter with the servant looking for the animal that gave Zadig the type

10 Voltaire, *Zadig*, 132-133.

of knowledge necessary to make sense of all the clues: the traces that he saw did not belong just to any dog with certain physical characteristics, but to the Queen's bitch that had been lost. This leads to a second and even more central aspect of Zadig's recollection: his investigation led to the knowledge of an individual and singular thing, as opposed to an uncharacterized specimen of a certain species. The traces left by the animal allowed Zadig to reconstruct the appearance of one specific dog, as they were related to the individual physical characteristics that distinguish it from any other dog. This episode, because of the epistemic framework embedded in its narrative, was extremely influential even outside literary circles, to the point that biologist Thomas Huxley in 1880 coined the expression "the Zadig method" to describe the methodology used in those fields that Ginzburg would see as related to the emergence of the evidential paradigm.

According to Ginzburg, the disciplines that best exemplify the conjectural paradigm, and that contributed to its establishment, are psychoanalysis and art connoisseurship, but other disciplines based on this model are archaeology, geology, physical astronomy, paleontology, and, most importantly for this project, historiography. What these disciplines have in common is their reliance on the individuation, collection, and deciphering of particular clues to achieve knowledge of a broader event. In other words, they require the "ability to forecast retrospectively" by grounding one's investigation on the search for evidence that is imperceptible to most people.[11] The figure of Sherlock Holmes is exemplary of the role of the observing (or, more generally, perceiving) subject: he is able to solve each mystery because he is able to see the world differently from other people, including his partner Doctor Watson, and is therefore able to isolate clues in the continuum of perception.

11 Ginzburg, "Clues," 106.

It is important to point out that the evidential paradigm is based on the encounter between a clue and a perceiving subject, rather than on the subject's interpretation of the clue. This subtle difference, which may seem negligible, is instead the key to understanding the potential consequences of the evidential paradigm on the practice of both archival research and the writing of history. While post-modern historiography has stressed the importance of discourse in our understanding of history,[12] the model proposed by Ginzburg gives back to documents their centrality to the historian's investigation.[13] The primary goal of research is to recognize evidence as such; only then is it possible to formulate hypotheses, or conjectures, as the expression "conjectural paradigm" suggests. History, according to Ginzburg, is "forever tied to the concrete."[14] The "concrete" of my investigation is embodied in film objects, and, while the chain of hypotheses that I am going to formulate may bring me far from the objects themselves, their examination and the individuation of the clues they carry remains the point of departure and the *conditio sine qua non* of my historiographical work.

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12 This tendency was influenced, among other things, by some readings of Michel Foucault, *The Order of Things: An Archaeology of the Human Sciences* (New York: Pantheon Books, 1971) and Michel Foucault, *The Archaeology of Knowledge* (New York: Pantheon Books, 1972). See, for example, Hayden White, "Foucault Decoded: Notes from Underground," in *History and Theory* 12.1 (1973): 23-54; Hayden White, *Metahistory. The Historical Imagination in Nineteenth-century Europe* (Baltimore: Johns Hopkins University, 1973); Eva Domańska, *Encounters. Philosophy of History after Postmodernism* (Charlottesville: University Press of Virginia, 1998).

13 A more explicit and thorough elaboration on this aspect can be found in Carlo Ginzburg, *History, Rhetoric, and Proof. The Menahem Stern Jerusalem Lectures* (Hanover, NH: University Press of New England, 1999). Here, in an open (though unstated) polemic with Hayden White, Ginzburg explicitly condemns the recent tendency to value rhetoric over proof, by showing that proof has always been a key feature of rhetorical discourses rather than being opposed to them. In so doing, Ginzburg reinstates the centrality of documents and facts in the historiographical investigation against post-modern tendencies to consider them as mere products of discursive rhetoric.

14 Ginzburg, "Clues," 97.

The examination of film objects in their materiality can lead to a different perspective on the study of cinema, while at the same time reassessing the nature of cinema as a complex, multifaceted entity which engages with broader historical issues in complicated ways. Film objects, as physical materials having an industrial and cultural history that goes beyond their aesthetic value, can be an invaluable primary source for historiography, insofar as they present clues that cannot be found anywhere else. An example of this potential, which I will explore at length in my third chapter, is provided by a group of films found in an Italian film collection in 2010. These films are on 16mm nitrate stock, a material that supposedly does not exist. And yet, the discovery of these materials means not only that what was thought about film industrial history was inaccurate, but also that there is a privileged point of entry into a history that was previously unknown. This point of entry is embodied in the film themselves and in the materials of which they are made. They are the "concrete" of the historian's investigation. Those films presented clues that allowed the researcher to identify them as unusual, and are themselves clues of a history involving their manufacturer, the Italian Ferrania, and the company that owns the collection in which they were found, the Catholic San Paolo Film. Their concrete existence is what allowed me to reconstruct their history, while at the same time being an example of the manifold ways in which cinema is inextricably intertwined with history not only in the text of the films, but also in the materiality of its objects.

Materiality, Media Historiography, and the Digital Turn

This project could not have been conceived at any other moment in the history of visual

media, as its driving force is the changed status of film after the shift from analog to digital technology. The introduction of digital cinema has fueled a lively debate in media studies for the past couple of decades, fostering a renewed interest in the ontology of the medium. While some scholars, adopting mostly a phenomenological perspective, see a continuity between analog and digital cinema, others identify a clear break on the basis of an ontological difference between the photochemical and the digital moving image, to the point that digital technology has been seen by some as the end of cinema as we know it.[15]

However, the scholarly debate surrounding digital cinema has been concerned mostly with the metamorphosis of the nature of the photographic image, be it moving or still, or with the transformation of cinema as a historical and aesthetic notion. Conversely, the archival world has been lamenting the lack of reliable conservation strategies for digital files, but hardly ever has been approaching the issue from a theoretical perspective.[16] In other words, the discussion has been polarized between what Giovanna Fossati calls film as conceptual artifact and film as material artifact, but only a few works attempt a synthesis between the two aspects.[17] This approach has had deep and sometimes misleading consequences on our understanding of cinema

15 Representatives of the two groups will be discussed in Chapter 1.

16 See, among others: Aa. Vv., *The Digital Dilemma. Strategic Issues in Archiving and Accessing Digital Motion Picture Materials* (Hollywood, CA: Academy of Motion Picture Arts and Sciences, 2007) and Aa. Vv., *The Digital Dilemma 2. Perspectives from Independent Filmmakers, Documentarians and Nonprofit Audiovisual Archives* (Hollywood, CA: Academy of Motion Picture Arts and Sciences, 2012); Howard Besser, "Digital Preservation of Moving Image Material," in *The Moving Image* 1.2 (Fall 2001): 39-55; David S. H. Rosenthal et al., "The Economics of Long-Term Digital Storage," in *The Memory of the World in the Digital Age: Digitization and Preservation Conference Proceedings* (UNESCO, 2012).

17 See, among others: Giovanna Fossati, *From Grain to Pixel. The Archival Life of Film in Transition* (Amsterdam: Amsterdam University Press, 2009); Paolo Cherchi Usai, *The Death of Cinema. History, Cultural Memory and the Digital Dark Age* (London: British Film Institute, 2001).

and of the transformations that the introduction of digital technologies has occasioned. One of them has to do with the way in which part of the theoretical discourse on digital technologies is founded on an implicit understanding of analog cinema as a stable and coherent concept. Theoretical studies on digital cinema often treat the analog past as a neutral background on which to project the revolution that digital technology has occasioned, so obliterating the complexities of that past, obscured by the simple and undifferentiated label "analog." A closer attention to the materiality of films, and to the evidence embodied by individual objects, would enable to unveil that complexity and at the same time would show how the digital present is affecting not only the future of cinema, but also its past.

Key to this mechanism of mutual influence is the concept of obsolescence. It seems almost without question that digital technology turned analog cinema into an obsolete practice. Today, the overwhelming majority of audiovisual works are produced, distributed, and experienced in digital formats. Films are even restored and preserved digitally – an operation with mostly unexplored consequences at the level of film theory, which I will discuss at length in my first chapter. However, obsolescence is far from being a neutral and transparent concept, as the debates that gave birth to the discipline of media archaeology demonstrate. What does it mean for an object to be obsolete? From whatever perspective one might look at it, one thing remains constant: obsolescence is not a property of the object, but a label applied to it based on its immediate usefulness. In other words, an object becomes obsolete once it is no longer used for the purpose for which it was originally created. Therefore, the mostly unstated premise of many theoretical works about the shift to digital cinema is that digital technology rendered analog cinema obsolete, and consequently opened up new possibilities for thinking about it. One

of the consequences of this transformation relates to what I have mentioned earlier: analog cinema became instrumental to the discourse surrounding digital technology. Analog technology became the coherent and mostly undifferentiated background against which to place studies of the ontology of the digital image, which in turn redefined the space of the analog image according to the conditions of the digital present. At the other end of the spectrum, there is a nostalgic attitude that gives rise to phenomena of fetishization of the obsolete object; the more obscure and odd the object in question, the higher the chances that it may be fetishized and cherished as a unique relic of a technological past.[18] This attitude is no less problematic than the previous one. Instead of crystallizing the concept of analog, fetishization crystallizes the object itself, and neutralizes it. The object becomes a specimen to be put under glass, rather than being treated as meaningful and generative evidence. In-between these two attitudes there are avant-garde artists, who employ obsolescence, and obsolete media, as a resource for their artistic projects.[19] Not far from them, there are media archaeologists.

Although media archaeology has established itself as a discipline only in recent years, its approach has revolutionized the way in which film and media history have been thought, studied, and discussed for the past couple of decades. Media archaeology has challenged the evolutionary and teleological model of film history that had been hegemonic for the most part of the twentieth century. The so-called New Film History, with its rediscovery of early cinema and its emphasis

18 See Timothy Druckey, foreword to Siegfried Zielinski, *Deep Time of the Media. Toward an Archeology of Hearing and Seeing by Technical Means* (Cambridge, MA: MIT Press, 2006).

19 See George Baker et al., "Artist Questionnaire: 21 Responses," in *October* 100, Obsolescence (Spring 2002): 6-97; Hal Foster, "An Archival Impulse," in *October* 110 (Fall 2004),:3-22. Also, the ninth edition of the Orphan Film Symposium, held in Amsterdam in 2014 and whose theme was "The Future of Obsolescence," interestingly featured as many avant-garde artists as film archivists and scholars.

on archival research, is a perfect example of media archaeology *avant la lettre*, and has been incredibly influential on the methodology that informs works that deal with a wide array of media.[20] By refusing teleology, media archaeology uses archival research to complicate the idea of a linear evolution in the history of media, and privileges instead moments of rupture, discontinuity, contradiction, and overlap. My project is certainly indebted to media archaeology, sharing its reliance on an approach that goes beyond the analog-digital opposition, and finding instead areas of continuity and overlap between the two technologies. However, there are a few aspects that distinguish my approach from that of media archaeology. One has to do with one of the unstated goals of the discipline, that is to discover (or create?) alternative genealogies in the history of media. One of the risks of this operation is falling back into a teleological model, even though the telos might be less apparent, and the "family relationships" highlighted may be different from those in traditional media history.[21] This is a hardly avoidable consequence when technological objects are used as samples of a certain technology, rather than as objects of investigation in themselves. This brings us back to the first effect of the digital shift that I listed: the creation of a fairly coherent analog world as a counterpoint to the digital one. If a film is considered as a representative of analog technology, rather than as evidence in itself, we may risk seeing the analog era as made up of interchangeable objects that share the same technological characteristics. Dividing up the realm of "analog" into sub-categories (such as "35mm," "16mm," "nitrate," "safety," "Technicolor," and so on,) would just shift the issue to a

20 See, among many others: Charles R. Acland (eds), *Residual Media* (Minneapolis and London: University of Minnesota Press, 2007); Erkki Huhtamo and Jussi Parikka, *Media Archaeology: Approaches, Applications, and Implications* (Berkeley and Los Angeles: University of California Press, 2011); Zielinski, *Deep Time of the Media*.

21 See Thomas Elsaesser, "The New Film History As Media Archaeology," in *CiNéMAS* 14.2-3 (2004).

smaller scale, but would hardly eliminate it.

I am by no means rejecting these approaches as wrong; over the past few decades, they fostered the production of an incredible amount of new knowledge, and I am myself deeply indebted to them. However, my goal is to propose an alternative methodology that may integrate the existing ones with the analysis of objects taken in their singularity, and hopefully produce a type of knowledge that may enrich the approaches I briefly discussed. An understanding of individual objects as historical evidence would also complicate the concept of obsolescence, and would show that "obsolescence," while having an effect on our perception of analog cinema, is too broad a term to encompass all the ways in which cinema is experienced, used, and thought about. Examining film objects for the clues they offer means treating them as significant in themselves, regardless of their supposed technological obsolescence.

Focusing on film objects as sources of material evidence gives back to analog cinema its complexity and its paradoxes. For instance, it would reaffirm the idea that there are no two identical film prints, and that each of them represents the embodiment of a set of historical and technological peculiarities that are not reproducible, despite belonging to a medium whose nature is based on reproducibility.[22] The nitrate 16mm films that I mentioned earlier are a perfect example of this evidentiary potential. They can be meaningful and generative evidence only insofar as they are materially different from other 16mm films, as opposed to simple specimens of analog technology.

Examining cinema from the point of view of the material objects of which it is made up

22 For a discussion of film objects' uniqueness, see Michele Canosa, "Per una teoria del restauro cinematografico," in Gian Piero Brunetta (eds), *Storia del cinema mondiale* (Torino: Einaudi, 2011), 965-1068. Canosa argues that film copies become unique in the course of history, although he adopts an aesthetic approach to the issue rather than an evidentiary one.

would also include in the discussion of the medium the traces that history leaves on film objects, and would enable to read these traces as clues that point to broader historical phenomena. Studying "film objects," as opposed to "the film object," helps us understand part of the historical complexity that is lost when dealing with analog cinema as a mere undifferentiated creation of our digital present.

This brief account of the driving forces and methodologies of my project seems to contrast with what I wrote at the beginning of this introduction – that is, that my project could have not been conceived at any other moment in history. Does this not mean reading the analog through the lens of the digital? Is this not exactly what I have been trying to distance myself from? These questions have a twofold answer. From the point of view of historical research, I cannot avoid the fact that I am writing in the digital age, and that my position is necessarily retrospective, as the look of the historian always is. But acknowledging the position of the investigator and imposing her interpretation on the object of investigation are two very different things, and I will try to avoid the trap of the latter attitude. This is another reason why the evidential paradigm, with its emphasis on the perceptual activity of the observer, is a helpful model to follow for archival research, as it places the observation of the object at the core of the researcher's investigation, rather than privileging interpretive practices. Of course, the boundary between objectivity and subjectivity can be blurred, and complete objectivity in historiography and related fields is impossible, perhaps not even desirable. Individual perception is by definition a subjective act. Nonetheless, I would maintain that the evidential paradigm foregrounds the object itself, and consequently places the emphasis on careful and rigorous observation of the object, rather than on interpretive practices. As I wrote earlier, the first step in the methodology

that the evidential paradigm underlies is the individuation of the clue as such, followed by the identification of the relationship between the trace and its source.

From a theoretical perspective, there are two reasons that make a project such as this unthinkable at any other historical moment. On the one hand, the advent of digital technology has changed our perception of the analog, as I will discuss at length in Chapter 2. The second reason is more practical, and it has to do with what Giovanna Fossati calls "the archival life of film." The last couple of decades have witnessed the emergence of an archival practice that complicates even further the analog-digital relationship and our understanding of it. I am referring to the practice of digital restoration and preservation of analog moving images, that is, the digitization of analog film and the manipulation of the resultant file in order to achieve a result that looks as close as possible to what the original film was supposed to look like in its assumed pristine condition. Digital preservation is the lens through which we see the real revolutionary potential of the transition from analog to digital technology in cinema: unlike previous technological changes, such as the shift from silent to sound film, or that from black and white to color, the so-called digital revolution has the power to extend its influence retroactively and effect an unprecedented re-writing of film history.

The theoretical consequences of this operation are manifold. One of the key elements has to do with the effects of digital restoration on the film objects that undergo this process. Technically, the film rolls remain unchanged. One of the rules of film preservation warns against any operations that may damage the print source.[23] However, on a theoretical level, their status is changed. Once a film is digitized, its analog copies are *de facto* taken out of mainstream

23 See Ray Edmonson, *Audiovisual Archiving. Philosophy and Principles* (Paris: UNESCO, 2016).

circulation, except for special screenings that are often defined, tellingly, as *archival* screenings. In fact, I will argue that digital preservation turns films into *archival objects*. This shift has consequences both on the objects themselves and on the assets of film archives, but it also shows the contradictions embedded in the concept of obsolescence. First and foremost, the shift to "archival object" is a change in how we think about film, not in its material nature. Film objects remain physically unchanged whatever we want to call them. Besides, film objects remain the main source for potential further restoration steps. When Warner Bros decided to create an Imax 3D version of *The Wizard of Oz* (Victor Fleming, 1939), they went back to the camera negatives and used them for the purpose for which they were created in the first place: as a source for the production of several positive copies.[24] Whether we want to call such an operation a "restoration" is debatable; however, this shows that an archival object is not necessarily an obsolete object – or, to put it differently, that the complexity of the concept of obsolescence itself is worth exploring further.

Archival Practices and Film Theory: A Different Perspective

One of the main goals of this project is the investigation of the evidentiary value of film through the use of the evidential paradigm, which would make it possible to achieve a different type of knowledge than a broader examination of technologies would provide. However, there is also a larger goal that precedes (and exceeds) the analysis of film objects and provides the

24 See David S. Cohen, "*The Wizard of Oz* Imax 3D Conversion: Polishing a National Treasure," in *Variety* (September 19, 2013): http://variety.com/2013/digital/news/the-wizard-of-oz-imax-3d-conversion-1200610859/ (accessed April 22, 2016).

theoretical grounding for this kind of historiographical work: the inclusion of film archival practices into broader discussions of cinema, with regards in particular to film theory. Theories of archival practices are rare, but important efforts have been done, especially in recent years. Pioneering work in this field has been done by Paolo Cherchi Usai, who, with his book *Burning Passions: An Introduction to the Study of Silent Cinema*, already in 1994 introduced an archival perspective to the study of silent films.[25] A more recent example is provided by Giovanna Fossati's book *From Grain to Pixel. The Archival Life of Film in Transition* from 2007, one of the most influential attempts to theorize the film archive and to put archival practices under the scrutiny of film theory. However, I believe that there is still much work to be done in the opposite direction – that is, to offer an archival perspective on film theory, and to explore how archival practices influence our understanding of cinema.

The issue of digital technology is a privileged place to locate the intersection of archival practices and film theory: while theory can guide archival work, as Giovanna Fossati's book argues, archival work can redefine some of the issues in the theoretical discussion of digital technology applied to cinema. The introduction of the digital has been revolutionary for film theory and film archiving alike, and yet different fields have been facing the issue rather independently, so preventing a more general theory that would take into account all the different employments of digital technologies from being formulated. Although I do not have the ambition of writing a grand theory of digital cinema from an archival perspective, I do believe that a more careful examination of the archival influence on our understanding of digital is necessary, and can unveil aspects that have been so far overlooked.

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25 Paolo Cherchi Usai, *Burning Passions: An Introduction to the Study of Silent Cinema* (London: British Film Institute, 1994).

An exploration of the theoretical potential of archival practices is at the core of my first two chapters. In the first chapter, I will investigate the theoretical consequences of the practice of digital preservation. After an explanation of the process of photochemical and digital preservation, I will explore the theoretical implications of both. I will show that different archivists and scholars have been approaching the introduction of digital technology in the field of film preservation in radically different ways – by either rejecting the new technological tools as inconsistent with how film is supposed to be experienced, or by embracing the revolution on the basis of the unprecedented manipulation and dissemination potential that it offers. A similar divide has affected film theory, to the point that the advent of digital technology has been saluted by some, and lamented by others, as the end of cinema, while a third group has been arguing for the continuity of the concept of cinema despite the technological revolution it is undergoing. Whatever position one might take on the issue, the digital preservation of analog moving images, by creating hybrid objects which retain their analog past in their content, but are digital in their materiality, shows how blurred the boundaries between analog and digital technology can be. A reading of some of the theories on digital cinema through the lens of digital preservation helps understand not only the complexity of the analog-digital relationship, but also the consequences that digital preservation itself is having on our understanding of cinema in general, and film history in particular. My claim is that digital preservation re-writes film history onto a different technological realm, which possesses a radically different materiality and operates according to different modes of reproduction. This re-writing has a two-fold consequence: while it creates new objects that can be considered as simulations of the older ones, it also changes the status of digitized analog films, which are turned into archival objects. In addition to this, the digital

preservation of analog film also unveils the material complexity of the technology that has been simply labeled as "analog."

Analog film and its changed status in the digital age is at the core of my second chapter. Through an analysis of film archival cataloging structures, I will show the different levels in which a film can be conceptualized, from the highest level of the abstract "work," to the lowest level of the material "item." This analysis will help understand the relationship between the material nature of individual objects, film preservation, and film history, and will offer a different perspective on the change operated by the introduction of digital technologies. Key to this change is the supposed obsolescence of analog film materials, a concept that I have already introduced here and that I discuss at length in this chapter. I will show that obsolescence works on two levels: one discursive, with regards to the obsolescence of a technology in general, and one pragmatic, which affects individual objects related to that technology. It is at the intersection of these two levels that it is possible to locate the transformation effected by the digital turn in general, and by the digital preservation of analog moving images in particular, on film archival holdings, whose status changes from objects of use to archival objects. This shift opens up new ways for thinking about film, in particular by highlighting the evidentiary potential embedded in its very material existence. In addition to this, an understanding of films as archival objects can also help archives find new modes of engagement with their analog holdings, including those that, for any reason, may not be projectable. Films as archival objects can be used as primary sources for historiography, an operation which would also challenge their supposed obsolescence.

The use of film objects as primary sources for historiography is the methodology guiding

my third chapter, where I reconstruct the early years of an Italian Catholic film company, San Paolo Film, by investigating a group of negative films found in its collection. These films are particularly noteworthy as they are on nitrate 16mm film stock, a material that, as I mentioned earlier, supposedly does not exist. My investigation of the circumstances that brought to the manufacture of such odd objects will shed light not only on broader historical phenomena, but also on the potential of the evidential paradigm for the study of film. The circumstances of the discovery of the nitrate 16mm films resemble closely the "Zadig method" that I have described at the beginning of this introduction, and at the same time highlights the limits of the evidential paradigm itself. Nonetheless, the employment of this epistemic framework for the study of film objects is helpful insofar as it offers a different perspective on the study of the materiality of film, while also offering an additional challenge to the understanding of the concept of "analog" as an undifferentiated category. Studying individual objects for the type of evidence that they can provide questions the relevance of the category of "analog" as simply opposing that of "digital," and invites a different attention to the different ways in which analog technologies have been employed in the course of history.

Underlying my whole project is the certainty that film archival practices can be of invaluable help for reformulating larger theoretical issues concerning both film studies and historiography. My hope is that this project may foster a renewed interest not only in archival issues *per se*, but also in the way in which archival practices can reshape theoretical and historiographical frameworks.

Chapter 1

Simulating the Past

The Digital Preservation of Analog Moving Images

The digital is such a lure because it promises to put an end to the human as we know it, which is to say, an end to the human condition – including our individual finitude.
Thomas Elsaesser[1]

In a famous essay from 2002, John Belton defined digital cinema as "a false revolution."[2] Writing at the dawn of the new millennium, when digital technology was being already employed massively at the post-production stage of filmmaking, but was not yet hegemonic in shooting and exhibition practices, Belton predicted that analog cinema would be the principal means for the collective experience of moving images for many years to come.[3] Writing in the second decade of the XXI century, we can state with no hesitation that his prediction proved wrong.

Today, the vast majority of feature films are produced, distributed, and exhibited in digital formats. The National Association of Theatre Owners (NATO) estimates that in the United States, as of March 31, 2015, 38,719 screens out of 39,789 have been converted to digital

1 Thomas Elsaesser, "Media Archaeology as Symptom," in Thomas Elsaesser, *Film History as Media Archaeology: Tracing Digital Cinema* (Amsterdam: Amsterdam University Press, 2016), 207.
2 John Belton, "Digital Cinema: A False Revolution," in *October* 100, Obsolescence (Spring 2002): 98-114.
3 I am referring to digital technology applied to the visual aspect of films; sound, as Belton himself points out, had already embraced digital many years before.

projection.[4] Although this figure might not take into account smaller and independent exhibitors, the ratio is still striking. The rapid shift of theatrical projection to digital technology implies that even features shot on film need to be transferred onto digital carriers in order to be distributed widely. From this point of view, the recent resurgence of film as a production format, exemplified by the agreement reached by Kodak with a group of major American studios for the sale of an undisclosed amount of film over an unspecified number of years, has to face the obstacle of exhibition.[5] Given the outstanding number of screens equipped to project only digital files, the vast majority of audiences is experiencing and will experience movies in form of aggregates of pixels, regardless of how they were shot.

Naturally, we cannot blame Belton for the inaccuracy of his prediction. Digital technology advanced at a much faster pace than anyone would have expected in the early 2000s. What is more important, though, is that the core of Belton's argument lays in the defense of the elements of continuity of the spectatorial experience between analog and digital projection. From this point of view, paradoxically, the quasi-all-digital present affects very limitedly Belton's claim that digital is a false revolution. He writes:

> Digital projection […] does not, in any way, transform the nature of the motion-picture experience. Audiences viewing digital projection will not experience the cinema differently, as those who heard sound, saw color, or experienced widescreen or stereo sound for the first time did. […] What is being offered to us is simply something that is potentially equivalent to the projection of traditional 35mm film.[6]

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4 http://www.natoonline.org/initiatives/cinema-technologies/, accessed September 25, 2016.

5 Carolyn Giardina, "Kodak Inks Deal With Studios To Extend Film's Life," in *The Hollywood Reporter*, February 4, 2015, accessed September 25, 2016, http://www.hollywoodreporter.com/behind-screen/kodak-inks-deals-studios-extend-770300.

6 Belton, "Digital Cinema," 104.

From this perspective, it is very difficult not to agree with Belton. He seems to suggest that digital technology is not at all a minor change for cinema, as one might be tempted to hurriedly conclude from his argument, but that digital theatrical exhibition betrayed its revolutionary potential in favor of a more conservative employment as a mere substitute for 35mm film. For instance, the potential for interactivity that digital technology has demonstrated in other media, such as television, computers, and cell phones, has not been exploited in movie theaters, where exhibition practices have mostly remained unaffected by the technological shift – at least as regards the spectatorial experience. This situation has not changed substantially since 2002, to the point that Belton himself reaffirms his position on the conservatism of digital theatrical projection in two recent contributions.[7]

Although it would be a mistake to believe that the core of the change induced by digital cinema is embodied exclusively, or even mostly, in the changed conditions of theatrical projection, it is not difficult to understand why Belton focuses on this particular aspect. For film scholars and filmgoers alike, the movie theater has always represented the privileged space where the communion between the spectator and the film could be consumed, the dark temple where the "cinema experience" would take place.[8] From this perspective, Belton's emphasis on the unchanged conditions of theatrical projection seems to reveal a subtle strategy to reaffirm that the movie theater remains at the core of cinema as a social experience, despite the proliferation of spaces and devices for the consumption of moving images. Even more subtly,

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7 John Belton, "*Introduction*: Digital Cinema," in *Film History: An International Journal* 24.2 (2012): 131-134: John Belton, "If Film Is Dead, What Is Cinema?," in *Screen* 55:4 (Winter 2014): 460-470.

8 See, among many others: Francesco Casetti, "Filmic Experience," in *Screen* 50.1 (Spring 2009): 56-66; Roland Barthes, "Leaving the Movie Theater," in *The Rustle of Language* (New York: Hill and Wang, 1986), 345-349.

Belton's argument is founded on an unspoken yet key assumption: that cinema in the digital age is still a medium with specific characteristics that distinguish it from other media, like television or computers.[9] This implicit premise is of the utmost importance. In fact, Belton's position is not shared by the majority of scholars who have dealt with the shift from analog to digital technology in audiovisual media, to the point that it has become common to refer to the present age as the embodiment of a post-cinema, or even post-medium, condition.[10] According to several studies, digital technology has decreed the end of cinema, and the concept of media convergence has superseded that of medium specificity.[11]

In this chapter, I will examine the different positions on the influence of digital technologies on our understanding of cinema, and will offer a different perspective by integrating some of the theories on digital cinema that have animated the scholarly debate for the past two decades with a practice that so far has not received the theoretical attention it deserves: the digital preservation of analog moving images. I will argue that digital preservation has a twofold effect on our understanding of cinema: while it challenges the stark contraposition between analog and digital technology on which most studies on digital cinema are founded, it operates a

9 My claim is confirmed by a later essay by Belton, in which he explicitly defends cinema's medium specificity. See Belton, "If Film Is Dead, What Is Cinema?," 470.

10 The earliest appearance of the phrase "post-media condition" can probably be found in Félix Guattari, "Vers une éra post-média," in *Terminal* 51 (1990). More recent elaborations on the issue can be found, for instance, in Rosalind Krauss, *A Voyage on the North Sea: Art in the Age of the Post-Medium Condition* (London: Thames & Hudson, 2000); Shane Denson and Julia Leyda (eds), *Post-Cinema: Theorizing 21st-Century Film* (Falmer: REFRAME Books, 2016); Miriam De Rosa and Vinzenz Hediger (eds), "Post-What? Post-When? Thinking Moving Images Beyond the Post-Medium/Post-Cinema Condition," special issue, *Cinéma&Cie International Film Studies Journal* 26 (2016).

11 See, for instance: Anne Friedberg, "The End of Cinema: Multi-media and Technological Change," in Christine Gledhill and Linda Williams (eds), *Reinventing Film Studies* (London: Arnold, 2000); André Gaudreault and Philippe Marion, *The End of Cinema? A Medium in Crisis in the Digital Age* (New York: Columbia University Press, 2015).

re-writing of film history that is based on the act of simulation.

The Digital Preservation of Analog Moving Images.

The term "film preservation" indicates the "overall complex of procedures, principles, techniques and practices necessary for maintaining the integrity, restoring the content, and organizing the intellectual experience of a moving image on a permanent basis."[12] In other words, preserving a film means putting in place a series of procedures to ensure its survival and future accessibility. As there is no official consensus on film archival terminology, the term "preservation" can be understood differently at different institutions.[13] Its meaning can range from the simple conservation of film archival materials in a controlled environment, to the creation of new copies for conservation and access, to complex restoration processes. However, it is generally agreed upon that the expression "film preservation" places the emphasis on the practices necessary to make sure that a film is not in danger of disappearing. These practices usually include at the very least the creation of a copy that can be accessed and projected. Saying that a film has been preserved means that its long-term survival is guaranteed, and that the preserved copy can be experienced in a movie theater. In most archives, preservation work

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12 Paolo Cherchi Usai, *Silent Cinema: An Introduction* (London: British Film Institute, 2000), 66. A similar definition, probably inspired by Cherchi Usai's work, is provided by the International Federation of Film Archives (FIAF) in its glossary of technical terms, available at http://www.fiafnet.org/pages/E-Resources/Technical-Terms-Full-List.html (accessed September 13, 2016).

13 On terminological confusions and their marketing value, see Vinzenz Hediger, "The Original is Always Lost. Film History, Copyright Industries and the Problem of Reconstruction," in *Cinephilia. Movies, Love, and Memory,* ed. Malte Hagener & Marijke de Valck (Amsterdam: Amsterdam University Press, 2005), 133–147.

covers the entire range of processes from the selection of the copies to be preserved to the long-term storage of the preserved elements in temperature- and humidity-controlled vaults.

One of the steps in the process of film preservation is that of restoration – a term that is often mistakenly used interchangeably with preservation.[14] Film restoration is "the set of technical, editorial and intellectual procedures aimed at compensating for the loss or degradation of the moving image artifact, thus bringing it back to a state as close as possible to its original condition."[15] Film restoration work ranges from the correction of defects or damage in the image to more complex procedures in which it is necessary to operate editorial decisions concerning the textual integrity of the work that is being restored. For instance, the assembly of different copies in order to reconstruct the complete version of a film is one of the most complex restoration practices. The case of the restoration of *Metropolis* (Fritz Lang, 1927) is exemplary in this respect, and shows how the vicissitudes of a film and those of its restoration history are intimately connected. To have a sense of how complex the intertwining of these two historical storylines can be, and to have a concrete example to which to go back when discussing the theoretical implications of film preservation, it is helpful to linger on some details of the history of *Metropolis*, from its initial release to its latest restoration.

Until recently, it was thought that the complete version of *Metropolis* could only have been seen in Berlin for a few months after its premiere in January 1927. This version was 4,189

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14 I am using the terms "restoration" and "preservation" as indicated by Paolo Cherchi Usai in his book *Silent Cinema: An Introduction*. In other sources, the term "restoration" is used only when significant technical intervention is needed to achieve a satisfactory result in the duplication process - see, for instance, Leo Enticknap, *Film Restoration. The Culture and Science of Audiovisual Heritage* (London: Palgrave Macmillan, 2013), 34. However, as it is difficult to establish how much technical intervention is needed for it to be "significant," I prefer to use Cherchi Usai's definitions.

15 Cherchi Usai, *Silent Cinema*, 67.

meters long, that is, approximately 151 minutes at 24 frames per second (fps).[16] Due to the commercial failure of this initial release, *Metropolis* was recut and distributed in different versions both in Germany and abroad. In August 1927, only a few months after the Berlin premiere, a new censorship visa was issued for a shorter version of *Metropolis* (3,241 meters) to be circulated in Germany as part of the regular domestic circuit. In the meantime, another recut version was made for American distribution. This foreign version was 3,100 meters long: according to contemporary reviews, it was not only shorter, but presented a completely different cut. The order of some of the scenes was altered, some scenes were added and some were taken out from the second German version. This first American version was replaced very soon by an even shorter version, which apparently circulated in Germany as well. In fact, when the Museum of Modern Art (MoMA) in New York asked for a print of the film from the Reichsfilmarchiv in 1936 in order to strike a negative for its own collection, the film they received was only 2,530 meters long – that is, a little more than a half of the original length. This is the version that circulated more widely in the post-war period, and the version that most people knew until the 1980s, when the film was restored for the first time.

The first, extensive restoration work on *Metropolis* was carried out in 1987 under the direction of Enno Patalas, a scholar who devoted his entire life to the task of restoring German silent films. The copy that served as the main material for this restoration work was the MoMA nitrate negative, which, being an early generation copy, had better image quality.[17] This material was integrated with scenes taken from other copies of the film that the Münchner Filmmuseum

16 It should be noted that an analysis of the original score has suggested that *Metropolis* was supposed to run at 28 fps, at least for the Berlin premiere.

17 The term "generation" indicates each printing step starting from the camera negative.

in Munich, Germany, had acquired throughout the years from different archives in Britain, Russia, Australia and Germany. I will not go into the details of what was in each print: for our purposes, suffice it to say that each copy was different from the others, both in length and in the editing structure. The original order of the shots was reconstructed thanks to annotations in the original musical score.

The 1987 restoration was only the first of several attempts at reconstructing the version of *Metropolis* that premiered in Berlin in 1927. In 2001, the Friedrich-Wilhelm-Murnau-Stiftung, under the supervision of Martin Koerber, carried out what was then believed to be the definitive restoration of *Metropolis*, which brought the length of the film to 124 minutes. Back then, it was thought that the restoration work was complete: archivists had been tracking down all the copies of *Metropolis* that were known to exist, and combined them to create a version that was still far from the one that premiered in Berlin, but was much closer to it than the 90-minute version that had circulated until the 1980s.

However, in 2008 something close to a miracle happened. Film scholar and *Metropolis* expert Fernando Martín Peña found a 16mm duplicate negative of *Metropolis* in the Museo del Cine in Buenos Aires, Argentina. Against all odds, it was a copy of the complete version of *Metropolis*, struck from a print that an Argentinian distributor arranged to have shipped to Argentina in 1928. This discovery prompted a new restoration of the film, carried out by Martin Koerber with the collaboration of Anke Wilkening and Frank Strobel from the Murnau Stiftung, and released in 2010. Shots from the Argentinian 16mm were added to the previous version, and frames were inserted even in shots that were already present in the 2001 restoration, so that not only the original succession of the shots was restored, but also their original length. Even though

this latest restoration is still missing two little fragments, due to the poor quality of the Argentinian 16mm materials, it represents the closest thing to a complete version of *Metropolis* that anyone has seen since January 1927.[18]

The case of *Metropolis* is not necessarily a typical one. It is uncommon to deal with so many versions of a film and to have so many film materials at the restorers' disposal. The complexity of the history of *Metropolis*, as regards both its initial release and its restoration vicissitudes, is due to both the wide distribution that the film had shortly after its Berlin premiere and the fame that it has achieved over the years. The two things are not unrelated. The creation of several shorter versions for domestic and international distribution has contributed to the proliferation of different copies of *Metropolis* conserved in archives worldwide, and has at the same time contributed to the creation of the myth of the "original *Metropolis*," the unattainable masterpiece that only screened once and supposedly was lost forever immediately after. However, *Metropolis*' case is exceptional more in the amplitude of the proliferation of its versions, both pre- and post-restoration, than in the mechanisms of proliferation itself. This is why such an extreme example is functional for understanding the measure of the potential intricacies of the restorer's task, as well as the peculiarities and the limits of film restoration itself.

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18 For a detailed account of the 2010 restoration of *Metropolis* (in German), see Aa. Vv., *Fritz Langs Metropolis* (München: Belleville, 2010). A rich description of the work done on *Metropolis* previous to the 2010 restoration, and of the numerous materials employed to reconstruct the history of the film, can be found (in German) in Enno Patalas, *Metropolis in/aus Trümmern* (Berlin: Bertz Verlag, 2001). For those who do not read German, a shorter account of the proliferation of the versions of *Metropolis* from its Berlin premiere to the 2001 restoration is available in English in Martin Koerber, "Notes on the Proliferation of *Metropolis* (1927)," in Dan Nissen, Lisbeth Richter Larsen, Thomas C. Christensen, and Jesper Stub Johnsen (eds), *Preserve Then Show* (Copenhagen: Danish Film Institute, 2002), 126-137.

The practice of film restoration is comparatively recent, and differs from more traditional fine arts restorations on a key point: although it is necessary to intervene on the materials that are subjected to restoration to make sure that they can be safely duplicated, the output of the process will be the production of a new object, be it a film print or a digital file. In the first case, the process is called photochemical restoration. In the second, digital restoration.[19] However, as we shall see, the distinction between the two types of restoration is not so clear-cut.

The peculiarity of film restoration as a process implying duplication, as opposed to modifications operated on an original artifact, has its roots in the nature of cinema itself as an art form based on reproduction. When we talk about a film, we are referring to an entity scattered around several copies that may or may not derive from the same source. In this sense, film restoration can be understood as the intersection between fine arts restoration and philological reconstruction. While film restoration has the physical intervention on a material artifact in common with the former, it also produces a new object that can be the result of the collation of several printed sources as the latter does.[20] This peculiarity is a consequence of film's double nature as text and material artifact, a distinction that can also be referred to as content and carrier. These two aspects cannot be separated one from the other: the text of the film depends on the kind of artifact on which it is inscribed. Again, the case of *Metropolis* exemplifies this concept very well. The different versions that have seen the light from the initial release of the film to its first restoration are the result of physical cuts made on the film prints (or negatives)

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19 For a detailed description of the technological aspects of film restoration, see Paul Read and Mark-Paul Meyer, *Restoration of Motion Picture Film* (Oxford: Butterworth-Heinemann, 2000), and Enticknap, *Film Restoration*, Chapter 3 ("The Technique of Film Restoration").

20 From this perspective, film restoration and preservation have many elements in common with paleography. A comparison between the two disciplines would be fascinating, and possibly very productive.

and of the duplication of such mutilated materials. These physical alterations directly caused modifications to the story, and, conversely, it was the desire to modify the plot that drove the physical alterations of the artifacts. However, it is important to notice that these changes to the narrative structure of a film are not necessarily caused by intentional interventions. Parts of a film may be lost due to decomposition, negligence, or chance. The two small fragments that could not be used for the 2010 restoration of *Metropolis*, and are therefore still missing, were placed at the end of a reel in the 16mm Argentinian copy, and for this reason were damaged to the point that they could not be duplicated. A fortuitous mechanical detail has had an effect on the integrity of the text as well.

The material and textual natures of film are linked also at another, subtler level. Each duplication step entails a loss of information in the image, or, in other words, a degradation of its photographic quality. This deterioration, which is an unavoidable consequence of the process of reproduction, is particularly evident if the output of duplication is a smaller gauge film. For instance, duplicating a 35mm film onto 16mm stock entails a substantial loss of photographic information that cannot be recovered even if the 16mm film is re-printed onto 35mm stock. This degradation is due to the printing process necessary to transfer the image between films of different gauges, called optical printing – as opposed to contact printing, which is the preferred photochemical duplication procedure for restoration.[21] Furthermore, small-gauge film is inherently of lower quality than 35mm film insofar as its frame needs to be enlarged twice as much during projection. However, even the most careful duplication necessarily entails a certain

21 For the technological details of these printing operations, see Read and Meyer, *Restoration of Motion Picture Film*, 126-148.

degree of degradation of the photographic image and of the soundtrack.[22] Broadly speaking, the contrast of the image increases and its density decreases at each duplication step. The further away one gets from the camera negative, the lower the quality of the print will be. If cinema is understood as something more than a simple storytelling device, as it is generally finally accepted, the influence of the degradation of the photographic image on the integrity of a film is evident. A low-quality film print is a mutilated text regardless of the cuts that may have been operated on it.

Technically speaking, the process of film restoration is closely related to that of the normal production of film prints for distribution. The difference stands in the source materials used for duplication and in the curatorial interventions that guide the process. While in the production of prints for distribution the source is the original negative, in restoration the source will most likely be a later generation copy (or copies, as in the case of *Metropolis*). This means that the source material is almost certainly in imperfect conditions due to mechanical damage, decomposition, shrinkage, photographic defects, or color fading in the case of color films. It is therefore necessary to repair the film source as carefully as possible to avoid further damage on it, and to operate a series of procedures before and during the printing process to avoid that the defects be printed on the restored print. Of course, more complex curatorial interventions are needed in case there are several print sources to collate, but we must not underestimate the importance of curatorial decisions in establishing the look of a restored film, and in selecting restoration methods that guarantee the integrity of the print source (or sources). In fact, one of

22 I am referring to optical soundtracks, which, in photochemical printing, undergo the same photographic process as the image. The restoration of sound is very complex, and the issues it raises only partially overlap with those related to the restoration of the image. In this chapter I will be dealing with the latter only, unless otherwise specified.

the pillars of archival ethics dictates that interventions that jeopardize the survival of the source materials must be avoided, and that the restoration work must be reversible.

The process that I have briefly described is entirely photochemical, meaning that all the restoration steps are based on the principles of photographic reproduction. This entails that the range of interventions at the restorer's disposal is limited. For instance, there are certain types of scratches or chemical degradation that cannot be corrected, or can be only partially corrected, in an exclusively photochemical workflow – the fading of color film stock being an obvious example. However, since the 1990s, digital tools have entered the realm of film restoration as well. The first feature film that underwent an entirely digital restoration was probably *Snow White and the Seven Dwarfs* (David Hand, 1937) in 1993.[23] It is not surprising that one of the pioneers of digital restoration was the Disney studio: at their inception, the cost of digital restoration tools was prohibitive for most archives. Today the cost of digital restoration has decreased substantially, to the point that most archives can afford at least partial digital restoration workflows. The 2010 restoration of *Metropolis* was carried out with digital tools: the source materials were digitized and processed with digital restoration softwares.

Digital restoration allows for a much wider range of interventions on the source materials, and also permits operation on more delicate films. For instance, heavily shrunken films that would be damaged in a photochemical printer can be safely digitized in a sprocketless scanner. Furthermore, the digital workflow keeps to a minimum the physical interventions on film materials in case several sources are involved in the restoration, as in the case of *Metropolis*. The different materials can be digitized separately, and the resultant files can be manipulated and

23 See Bob Fisher, "Off To Work We Go: The Digital Restoration of *Snow White*," in *American Cinematographer* 74.9 (September 1993).

edited together digitally – not differently from what happens with digital intermediates in contemporary film production.

The output of a digital restoration process can be either a film print or a digital file. In the first case, the digital file is transferred through a film recorder onto negative film stock, which will serve as the source for positive prints through standard photochemical printing; in the second, the most likely output format for access is a DCP (Digital Cinema Package), a hard disk that contains audio and video files of the digitized film to be projected in a theater. From a technical perspective, each choice has its pros and cons. A film output is much more expensive, as the cost of acquiring and processing film stock has not undergone the decrease that made digital scanning more affordable in the last decade. Besides, as I said at the beginning, the overwhelming majority of theatrical venues is now equipped for digital projection only. This means that having a DCP allows for broader circulation of the restored work. However, even without considering the different experiences that a DCP and a photochemical print offer in a movie theater, preserving a film digitally poses serious conservation issues. The conservation of digital files is an ongoing problem for archives. Digital files should be migrated every five years to avoid their corruption and the obsolescence of the file formats. Migration is expensive and time-consuming to the point that, in the long term, a film output turns out to be more economically viable. In fact, film is much more durable and reliable than digital files: if stored at the correct temperature and humidity level, modern film stock lasts for hundreds of years and does not require additional interventions.

The problem of conservation of the restoration output shows how restoration issues are an integral part of preservation practices, and must be examined under the light of broader

preservation issues. It is not sufficient to intervene on a film to enhance its photographic quality or restore its original narrative structure; it is also necessary to ensure that the result of the restoration work will last for as many years as possible.[24] Preservation should be the ultimate goal of film archives, both in cases where editorial interventions are needed and in cases where a curated duplication of an endangered film is sufficient. However, the concept of preservation is not as straightforward as it might seem. Let us go back to Cherchi Usai's definition of film preservation: he defines it as the "overall complex of procedures, principles, techniques and practices necessary for maintaining the integrity, restoring the content, and organizing the intellectual experience of a moving image on a permanent basis."[25] He then elaborates on this definition and explains in more detail what it entails:

> This seemingly vague definition is in fact the implicit acknowledgment of the three-fold purpose of the preservation work: making sure that the surviving artifact is not further damaged; bringing it back to a condition as close as possible to its original state; providing access to it, in a manner consistent with the way the artifact was meant to be exhibited.[26]

This explanation, rather than clarifying the concept of preservation, problematizes it further, especially as concerns the issues of restoration ("bringing [the surviving artifact] back to its original state") and access. Cherchi Usai's statement might seem reductive and naive. How can the artifact be brought back to its original state if the result of preservation work is necessarily the production of a new object? And how can the result of the preservation work be

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24 It is worth repeating that restoration is one of the steps in the preservation process, rather than being a separate and independent task. Throughout this chapter and the whole dissertation, I will use the term "restoration" when I intend to emphasize the editorial processes involved in the creation of a new copy, and "preservation" when the emphasis is in the long-term survival of the restored copy.

25 Cherchi Usai, *Silent Cinema*, 66.

26 Ibid.

exhibited in a manner consistent with its original exhibition setting, if those conditions no longer exist? However, at a closer analysis, Cherchi Usai's claim reveals an ideological mission, and one not dissimilar from Belton's definition of digital cinema as a false revolution. What Cherchi Usai is implicitly saying is that all preservation work must be carried out in the same technological realm in which the original artifact was produced. According to Cherchi Usai, real preservation can only be photochemical, and access should be provided through the projection of an analog print in a theatrical setting. Unsurprisingly, Cherchi Usai defines digital technologies as the "death of cinema" in a later contribution that redefines the concept of preservation according to the changes brought on by the emergence of digital tools for restoration.[27] For Cherchi Usai, the expression "digital preservation" is an oxymoron: a photochemical object can only be preserved photochemically, if its technological nature is to be respected. According to Cherchi Usai, digital technologies are definitely revolutionary, and screening a digital copy in a theatrical setting does not constitute an authentic experience – regardless of whether the audience is aware of it or not.

It should be noted that Belton does not refer to the screening of digitally preserved copies when he speaks about a false revolution. He is concerned with the transformation of cinema at large and, most likely, the exhibition setting he is examining is that of newly produced motion pictures. We cannot know whether he would maintain the same cavalier attitude if he were to discuss digitized analog prints. However, it is important to point out that Cherchi Usai's strict understanding of film preservation is not shared by everyone, even in the archival community.

An example of a diametrically opposite approach is Caroline Frick's book *Saving*

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27 Paolo Cherchi Usai, *The Death of Cinema: History, Cultural Memory and the Digital Dark Age* (London: British Film Institute, 2001).

Cinema. The Politics of Preservation.[28] Unlike Cherchi Usai, she suggests that digital technologies are a tremendous resource for film preservation, insofar as they allow for much easier access to audiovisual content and for a broader proliferation of that content itself. Adapting to our digital present the famous aphorism attributed to Henri Langlois, "To show is to preserve," Frick argues:

> Preservation copies, backup copies, distribution copies, DVD copies, video copies, downloadable copies, and even bootleg copies underscore one key thing for film preservation professionals to consider in the twenty-first century: Lots of copies can help keep media content around and available for education, appreciation, and enjoyment for the foreseeable future.[29]

In other words, Frick argues that the circulation of a high number of copies, regardless of their format, is the best way to safeguard the survival of a film. The more a film is accessed and duplicated, the higher the number of circulating copies of that film, thus enhancing the chances of its "preservation." Frick's pragmatic approach to the issue of preservation certainly has its advantages. Delegating curatorial decisions to the users who both produce and consume audiovisual content would be a way to democratize access to moving images, while at the same time fostering the creation of a new canon that is not decided in the narrow circles of archives or academia, but rather is determined by the users themselves thanks to their choices of what to see, share, and disseminate.

Frick's argument is also very problematic for at least two different reasons.[30] One has to

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28 Caroline Frick, *Saving Cinema*. *The Politics of Preservation* (New York: Oxford University Press, 2011).

29 Ibid., 176.

30 For a larger discussion of Frick's argument and the problems it poses, see Jan-Christopher Horak, "Saving Cinema: The Politics of Preservation (book review)," in *The Moving Image*, 12.2 (2012): 172-174.

do with the spectatorial experience: the abyssal difference in quality between a YouTube video and a 35mm print provides completely different experiences, even if the content is the same. As I wrote earlier, a low-quality version of a film is inherently a mutilated text. Furthermore, it is often very difficult to establish which version of a film one is watching on a streaming service, especially when videos are uploaded by non-institutional users. For instance, YouTube offers several videos of *Metropolis* that claim to be the complete version, but are considerably shorter than the 2010 restoration. The other reason is a little less intuitive, and it relates to film's nature as a material artifact. Frick's argument deals with the issue of the proliferation of copies of the same content in different formats, be they analog or digital, without providing a hierarchical organization based on each copy's relationship to its source. This approach is functional to her argument, which is based on a direct connection between access and preservation. If, as she writes, access in itself is preservation, then the easier the access, the more effective the preservation. The role that digital technology plays in this mechanism is very clear. Digital technology not only allows for fast duplication and dissemination of audiovisual files – in the case of digitization of films from the analog era, it also creates the opportunity to circulate films that would otherwise be accessible only in archives or in theatrical settings. As the case of *Metropolis* proves, proliferation of copies that might have little in common with the originating source is not a digital exclusive, but digital technologies certainly allow for much faster dissemination (and modifications) than photochemical duplication does. Frick's argument is interesting insofar as it challenges the archival emphasis on the issues of originality and authenticity. However, it does so by obscuring the centrality of the material nature of film. If talking about “originals” in the case of film is problematic, it is not because any copy can be

interchangeable with any other – on the contrary, it is because every copy is in itself an original.

This statement might sound counterintuitive when discussing an art form based on reproduction, but its validity is supported by archival practices. Digital technologies are certainly instrumental in changing our understanding of the concept of originality, but, from an archival standpoint, their effect contrasts sharply with the interchangeability suggested by Frick. The key for understanding this concept stands in the theoretical investigation of the digital preservation of analog moving images in light of broader discussions of digital cinema. If digital technology has changed the ontology of cinema, as has been argued by numerous scholars, the digital preservation of analog moving images creates hybrid objects that in turn challenge the very separation between analog and digital technology, and consequently our understanding of cinema as a whole. The hybrid nature of digitally preserved films is highlighted by the various degrees in which digital technology can be employed as a restoration and preservation instrument. As I mentioned, films can be scanned in order to manipulate the resultant file and print it back onto film stock. Alternatively, the preservationist can decide that the manipulated file itself will be the preservation output. There are also cases in which digital and analog technology coexist in the same object, as in the case of an experimental method to store the three color separations onto one strip of black and white film alongside optically-printed digital metadata to ensure their correct recombination.[31] If, as I wrote, a film is an entity scattered around several copies, what happens when some of these copies are digital, and therefore ontologically different from their own source? The studies of digital cinema that have been conducted so far have hardly ever

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31 See Sean McKee and Victor Panov, "Archiving Color Images to Single Strip Black-and-White 35mm Film – The Visionary Archive Process," in *SMPTE Motion Imaging Journal* 120.1 (2011): 24-28. This process is also mentioned in Enticknap, *Film Restoration*, 104.

included an examination of issues related to the digital preservation of analog moving images, and have therefore excluded those hybrid objects that digitization necessarily produces. Doing so forces us to re-think the ontological difference between analog film and digital file, and consequently to reconsider the complexities that the simple label "analog" obscures.

The Ontology of the Digitized Object

In discussing digital cinema and its betrayed revolutionary potential, John Belton warns against the risk of relating the introduction of digital technology to past periods of technological change within the moving image industry. He claims that "we cannot look to the path taken by one technology to explain or understand that of another. […] This is why contemporary comparisons of the advent of digital cinema to the coming of sound in the late 1920s are not only misleading but wrong."[32] Belton refers to a widespread attitude in cinema studies, that of trying to read the latest technological (false?) revolution under the light of other revolutions that cinema underwent throughout its history.

A recent example of this attitude is provided by André Gaudreault and Philippe Marion's book *The End of Cinema? A Medium in Crisis in the Digital Age*.[33] The authors identify eight examples of technological or social change that brought commentators to speak of a "death of cinema," from père Lumière's famous claim "Cinema is an invention with no future," to the transition from silent to sound, to the invention of the remote control; the latest threat to cinema's

32 Belton, "Digital Cinema," 100.
33 André Gaudreault and Philippe Marion, *The End of Cinema? A Medium in Crisis in the Digital Age* (New York: Columbia University Press, 2015).

survival would be the advent of digital technology. The authors seem to imply that, as cinema survived all the deaths that had been announced at every modification to its status, it will undoubtedly survive the shift to digital technology as well. However, this reasoning is by no means reassuring; tired of hearing the boy cry wolf, one might overlook the real warning when it is too late.

But are digital technologies really going to decree the end of cinema? Gaudreault and Marion do not take a strong position on the outcome of the digital shift, but seem to suggest that what used to be called "cinema" will survive in different forms as part of a multi-medial landscape with no prevailing players. In other words, cinema will not die, but will be (and is being) definitely revolutionized. Their stance contrasts sharply with that of Belton's, who rejects this notion on the basis of the continuity between analog and digital projection – and does so by comparing the movie theater experience in the digital age to other moments of technological transition, despite his warning against such analogies.

These two positions roughly mirror those of the many scholars who have been tackling the issue over the past couple of decades. While some speak of a continuity between analog and digital cinema, focusing on the similarities at the level of camera optics, projection and spectatorial experience in a movie theater, others see a clear rupture, on the basis of an ontological difference between the photochemical and the digital moving image.[34] These two

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34 In addition to those I have already discussed, scholars in the first group include, among others, Jacques Aumont, "Que reste-t-il du cinéma?," *Trafic* 79 (Fall 2011): 95-106, Fossati, *From Grain to Pixel: The Archival Life of Film in Transition*, and Tom Gunning, "What's the Point of an Index? or, Faking Photographs," in Karen Beckman and Jean Ma (eds), *Still/Moving: Between Cinema and Photography* (Durham: Duke University Press, 2008), 23-40. Representatives of the second group are, among others, Cherchi Usai, *The Death of Cinema*; Lev Manovich, *The Language of New Media* (Boston: MIT Press, 2001);

readings of the present situation are exemplary of a renewed difficulty in answering the fundamental question "What is cinema?" In this context, it might be helpful to rephrase the question and ask ourselves: *Where* is cinema? Or, where do we locate its essence? Is it in the collective experience of projection in a movie theater? Is it in the relationship between the camera and the world? Is it in its capacity to reproduce and influence the experience of time and movement? Is it in the projected image? An obvious answer would be: cinema is in all of these places at the same time, and, conversely, it is the interplay of these characteristics that defines the essence of cinema. But this answer is insufficient when dealing with digital cinema, insofar as digital technology does not affect all these aspects in the same measure, as Belton's emphasis on the unchanged conditions of theatrical exhibition in the digital age shows. One might argue that this is a proof of the pervasiveness of the concept of cinema, and of its resilience to technological transformations; cinema is still cinema even when not all these factors are at play. But, is it? Does the modification (or the absence) or even one of these aspects not jeopardize its interconnectedness with all the others, to the point that one cannot speak of "cinema" proper anymore?

This is the question that, explicitly or implicitly, has guided most studies on the ontology and the phenomenology of cinema for the past two decades, and has divided the field into proponents of the continuity of the concept of "cinema" and heralds of its dissolution into other media. Whatever stance one might take in this arena, the role of the digital preservation of analog moving images has been overlooked by most of the scholars who have been dealing with the issue. It is often taken for granted that digital cinema refers to moving images shot with a digital

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D. N. Rodowick, *The Virtual Life of Film* (Cambridge, MA; London: Harvard University Press, 2007).

camera and projected digitally in a movie theater, or else presented on a smaller, personal screen. At most, one might refer to the use of digital tools at the post-production stage of movie-making. This approach is limited by the fact that it is almost exclusively concerned with the production of new moving images, so conveniently creating a "before" and "after digital" that can have misleading consequences on our understanding of cinema history. In other words, this approach implicitly generates the fantasy of a comfortable and safe past where all images had a photochemical basis and an unproblematic indexical relationship with the world. Besides creating this mythical space, this kind of discourse crystallizes cinema's analogical past and closes it off beyond a hypothetical digital threshold that, as blurred as it may be, divides it from the uncertainties of the present and keeps it untouched from the current tumult.

Supposing that such an idyllic situation ever existed, it is far from being unaffected by the contemporary technological turmoil. The reasons for this can be fully understood only by including the practice of digital preservation of analog moving images within the discourse on digital cinema. Most theoretical studies on the effects of digital technology on cinema have overlooked its employment as a film restoration and preservation tool. Gaudreault and Marion briefly mention preservation as one of the fields in which digital technology is employed, but do not differentiate it from digital cinema production at a theoretical level.[35] This treatment of digital preservation is a mistake insofar as it overlooks the hybrid nature of digitized images and throws them into an undifferentiated group labeled simply "digital." Alternatively, John Belton limits his discussion of digital preservation to the issue of conservation of digital files, giving voice to concerns that archivists have been expressing for years: digital storage is not a viable

35 Gaudreault and Marion, *The End of Cinema*, 6.

means of conservation as it subjects the materials to a much higher risk of obsolescence and decay.[36] This problem has been discussed at length in technical literature but hardly ever has it been approached theoretically. After all, there is not much to theorize upon: that digital files have a much shorter lifespan than film stock is a fact proved by numerous reliable studies.[37] All archivists and scholars can do in this respect is to advocate for the continuation of film stock manufacture and for more reliable digital storage systems and practices.

There are other aspects of digital preservation that deserve a more thorough theorization, but so far few scholars tackled the issue. The main reason for this is probably to be found in the longstanding separation between archival practices and academic thought. Unsurprisingly, the works that more directly attempt to draw a theory from archival practices come from scholars who are also archivists and restorers.[38] However, I believe that there is a more profound reason behind this absence, and it has to do with that aforementioned fantasy of a safe space of analog cinema. Digital preservation disrupts the stability of our photochemical past, and forces us to reconsider it with potentially uncomfortable consequences.

As Belton points out with respect to the digital turn, it would be a historiographical

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36 Belton, "Digital Cinema," 114.

37 See, among others: Aa. Vv., *The Digital Dilemma. Strategic Issues in Archiving and Accessing Digital Motion Picture Materials* (Hollywood, CA: Academy of Motion Picture Arts and Sciences, 2007) and Aa. Vv., *The Digital Dilemma 2. Perspectives from Independent Filmmakers, Documentarians and Nonprofit Audiovisual Archives* (Hollywood, CA: Academy of Motion Picture Arts and Sciences, 2012); Howard Besser, "Digital Preservation of Moving Image Material," in *The Moving Image* 1.2 (Fall 2001): 39-55; David S. H. Rosenthal et al., "The Economics of Long-Term Digital Storage," in *The Memory of the World in the Digital Age: Digitization and Preservation Conference Proceedings* (UNESCO, 2012).

38 See, among others, Cherchi Usai, *The Death of Cinema*; Fossati, *From Grain to Pixel*; Jan-Christopher Horak, "The Gap Between 1 and 0. Digital Video and the Omission of Film History," in *Spectator* 27 (2007): 29-41.

mistake to create a parallel between two different moments of technological change, as the conditions in which these changes take place are continually evolving.[39] Nonetheless, I believe that the ways in which the digital shift is different from previous, seemingly similar moments needs to be identified and clarified. If this shift is observed from a preservation perspective, the newness of this latest transition appears in all its clarity: unlike the transition to sound, color, or widescreen, digital technology affects the nature of past moving images as much as future ones.[40] Here is the aspect that embodies the real revolutionary force of digital technology applied to moving images. The question "What is cinema going to be in the future?" should be asked side-by-side with another question that specifies and redefines it: "What is the future of cinema's past?" Digital technology applied to preservation wipes away the threshold dividing an analog past from a digital present. If those scholars who see the digital as the death of cinema are right, then we should be ready to not even have a corpse to lament. The preservation of analog films on digital carriers, concurrently with the switch from analog to digital technology in most exhibition venues, *de facto* takes out of circulation photochemical copies of the same title. If digital cinema is not cinema, then digital preservation erases our cinematic past as much as it renders a future impossible. The key characteristic of digital technology is therefore its power to act retroactively, operating a re-writing of film history that shakes the foundations of the very idea of "cinema."

At the present stage, of course, only a small percentage of analog films have been digitized. Even though their number will certainly grow in the future, it is unclear whether a

39 Belton, "Digital Cinema," 100.

40 It should be noted that previous technological changes have affected the perception of older technologies, similarly to how the digital has changed our perception of the analog. However, what I want to point out is that digital technology has operated a transformation of analog film that goes beyond the way in which the older technology is perceived, and affects the very materiality of digitized films.

point will be reached where all films made in the analog era will only be available in digital formats.[41] A number of factors are at play, including the future availability of film stock for photochemical preservation. Either way, the influence of digital preservation on film history is an understudied issue that deserves a theoretical formulation to guide us beyond the conundrum of the disappearance of film history with the disappearance of film. An analysis of preservation techniques under the light of the theoretical problems posed by the emergence of digital cinema is therefore beneficial both for archival practices and for the advancement of theoretical questions. In particular, it is necessary to integrate the scholarly and the archival discourses to discuss some of the aspects of digital cinema that are more directly affected by the practice of digital preservation: the passage from film stock to file formats, and the contextual shift from photochemical to digital images.

As Dan Streible points out in an article with a seemingly tautological thesis, digital film is not film. It is a file.[42] Streible elaborates on the consequences of this distinction and on the reasons why it is important to maintain it so as "not to lose important historical knowledge and awareness."[43] That there is a historical difference between a film reel and a digital file is apparent to anyone, but the theoretical consequences of this distinction lead into more prickly territory. The most discussed issue with regards to digital images is the potential disappearance of the indexical relationship between a photograph and the object it represents. Tom Gunning

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41 The shift to digital technology also poses issues of availability and access. In a way, digital preservation is also re-writing the canon of film history. On this very fascinating subject, see Horak, "The Gap Between 1 and 0," and, for a completely opposite point of view on the subject, Frick, *Saving Cinema*.

42 Dan Streible, "Moving Image History and the F -Word; or, 'Digital Film' Is an Oxymoron," in *Film History* 25.1-2 (2013): 227-235.

43 Ibid., 229.

summarizes the terms of the problem very clearly:

> The indexicality of the photograph depends on a physical relationship between the object photographed and the image finally created. The image on the photographic negative derives from the transformation of light sensitive emulsion caused by light reflecting off the object photographed filtered through the lens and the diaphragm. In a digital image, however, instead of light sensitive emulsion affected by the luminous object, the image is formed through data about light that is encoded in a matrix of numbers.[44]

Gunning rejects the conclusion that a digital image loses its indexical relationship to the object represented, and therefore claims that the so-called "truth claim" of photography remains virtually untouched in the digital age. However, he acknowledges that digital technology offers extraordinary means of manipulation of the image, to the extent that its indexical and iconic relationship to its referent may be stretched to the point of rupture. Although manipulation was certainly possible in the photochemical age, the ease and range of modifications offered by digital technology are unprecedented. Nonetheless, Gunning maintains that this potential for fakery does not jeopardize the truth claim of digital images, but rather opens up new possibilities for creative manipulation. However, I believe that the digitization of analog images complicates this discourse and forces us to reconsider the notion of "indexicality" itself.

The relationship between an analog film and its digitization gives new meaning to Streible's distinction between film and file that I previously defined as a seemingly tautological claim. A digitized image may retain an indexical relationship with the object represented, but it complicates the concept of index in its relationship to the film it digitizes, or at least with parts of it. Before being an index of the world, a film is a film: namely, it carries information that goes beyond its so-called "content," or the object it represents. In other words, digitization reproduces

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44 Gunning, "What's the Point of an Index?," 40.

the image recorded on film, but does not reproduce the film itself with all the information it carries with it. As I said earlier, film is both image and artifact.[45] Although some argue that digital cinema lacks this duality, digital files also have a twofold nature: they are stored on material carriers that undergo a process of decay just as film does. However, the dual nature of films and files overlaps only at the level of content; as artifacts, their nature is radically different.

The issue of manipulation complicates things even further, and can be fully understood in light of D. N. Rodowick's concept of the "digital event."[46] "A digital event," he argues, "is any discrete alteration of image or sound data at whatever scale internal to the image."[47] In other words, a digital event occurs when a digitally captured image is manipulated so that elements may be added, subtracted, or modified. The peculiarity of the digital event stands in the undifferentiated nature of the pixels that compose the captured image from those that compose the synthesized additions to it. For Rodowick, the consequence is that "The basis of all representation is virtuality: mathematical abstractions that render all signs as equivalent regardless of their output medium. Digital media are neither visual, nor textual, nor musical – they are simulations."[48] Image compositing, as Rodowick acknowledges, is not a digital exclusive; matte shots and superimpositions are common examples of analog compositing. But the digital event is something different insofar as it combines captured images with computer-generated ones in ways that collapse the ontological differentiation between the two. When dealing with fiction cinema, this peculiarity has purely ontological implications, opening up an enormous array of creative options for filmmakers – and, according to Rodowick, changing the

45 See Fossati, *From Grain to Pixel*, 104-105.
46 Rodowick, *The Virtual Life of Film*, 163-174.
47 Ibid., 167.
48 Ibid., 11.

temporal dimension of new media. However, if the same technique is applied to digital restoration and preservation, ethical issues must be considered in addition to ontological ones.

At this point, the truth claim of photography needs to be re-examined with respect to the manipulation of digital images in the restoration process. Digital technology offers to the restorer a creative freedom that was unforeseeable in the photochemical age. Once the print source is digitized, the resulting file can be manipulated indefinitely before it is transferred back either to film stock or to a digital carrier. Certain kinds of manipulation are just not possible with photochemical restoration; severe color film fading, for instance, cannot be corrected with analog means. Digital technology also allows the reconstruction of parts of the frame that were lost in the print source due to decomposition or mechanical damage to the emulsion – an operation that is also impossible in photochemical printing. Given the extent of potential intervention that digital restoration offers, can one say that a digitally manipulated file is truthful to its print source? This question can have several different answers depending on one's definition of "truthful" and on the object of investigation. If we refer to the physical print source, then a digital restoration is definitely not truthful, and it is not supposed to be. What is being restored is not the print source but rather the idea of what that print source looked like when it was in pristine condition. In other words, digital restoration is a *simulation* based on an educated guess. This is where ontology and ethics become intertwined: digital simulations offer the possibility to overcorrect, adding elements that were never there or removing unwanted details. Archival ethics prevent restorers from intervening on a file with a different goal than restoring the ideal look of the film, but not all restorations are carried out by archives. Private companies' ethics might be guided by different principles. The risk is that of a proliferation of simulations that have little in

common with what the film looked like before the restoration.

The case of the preservation of *Miracle in Milan* (*Miracolo a Milano*; Vittorio De Sica, 1951) is a perfect example. The film tells the story of Totò, a man living in a shantytown on the outskirts of Milan during the post-war period. The misery of the lives of Totò and his friends are narrated by De Sica with a light and humorous touch which, together with the supernatural element of the "miracle" that gives the film its title, contrasts sharply with the harshness of the shantytown. This combination creates a new synthesis between neorealist aesthetics and fairy-tale atmosphere. At the end of the film, Totò and his friends escape the squalor of their condition by flying away on broomsticks. In the version that was originally released and in all the prints available before the restoration, it was possible to see the wires that held the flying broomsticks. When the film was digitally restored in 2001, the wires were erased from the image. The restoration was funded by the Vittorio De Sica Foundation, whose president at the time was the Vittorio De Sica's son, Manuel De Sica. Manuel De Sica declared that his goal was to fulfill his father's alleged desire: to cancel what he considered a flaw in the version that was released in 1951. Regardless of the veracity of Manuel De Sica's claim, this operation is highly problematic insofar as it creates not only a historical falsity, with all the consequences that may derive from it on the level of film analysis and film history – the wires holding the broomstick were the physical embodiment of the synthesis between the neorealist heritage and the desire to go beyond the post-war canonical style of Italian cinema; it also creates a digital event that indistinguishably blends digitized elements and synthesized ones.[49]

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49 Some details of the restoration of *Miracle in Milan* are reported in the volume: Gualtiero De Santi, Manuel De Sica (eds), Miracolo a Milano *di Vittorio De Sica: Testimonianze, interventi, sopralluoghi* (Roma: Pantheon 1999).

This example shows how the concept of simulation has farther reaching implications than its malleability to the will of the restorer. Manipulating the image digitally means mixing captured elements with synthesized ones in an undifferentiated way: digital restoration creates a series of digital events. In other words, it creates simulations without differentiation between past and present. If in the case of *Miracle in Milan* the digital event is obviously problematic, there are other cases that are not so clear-cut, and in which the digital manipulation is actually completely legitimate according to archival ethics. The erasure of scratches and dust, for instance, or the replacement of damaged parts of the frame in the case in which the adjacent frames are intact and can therefore be copied onto the missing parts of the image to be reconstructed. Although these interventions are totally acceptable from the point of view of archival ethics, they pose interesting ontological questions that also have historical repercussions. Remaining "truthful" to the idea of how a film was supposed to look like in its pristine condition does not make digital preservation any less problematic. There are also cases in which some traces of damage on the print source, like scratches or dust, are left in the digital copy as testimonies of the passing of time.[50] The restorers of *Metropolis* made exactly this decision with the materials digitized from the Argentinian 16mm, which was in very poor conditions. Even an unexperienced spectator would be able to tell the parts that were already in the 2001 restoration apart from the 2010 insertions, which look scratched and of much inferior photographic quality. It should be noted that the damage in the Argentinian 16mm was so severe that it would have been impossible to eliminate it completely, even with digital restoration tools. Nonetheless, the restorers made a conscious choice not to overdo the cleaning of the newly-

50 A similar concept in fine arts restoration would be that of *patina*.

found images in order to leave a tangible sign of the complexity of the restoration work, and of the history of the individual copies used to assemble the definitive version. However, the digital file of the 2010 restoration does not bear any material traces of the difference between the copies, as all the materials were converted into indistinguishable pixels. By examining the file, it would be impossible to discern what was modified and what was simply transferred from film to digital.

The main peculiarity of digital technology stands not in its act of simulation of analog technology, but in its placement of the output of the restoration in an eternal present, where images from the past and contemporary interventions are indistinguishably blurred in a flow of pixels and can be reproduced indefinitely in this new form. In fact, unlike what happens in photochemical duplication, the migration of digital files can be completely lossless. In other words, a file does not undergo any visible changes when it is transferred to a different storage carrier. If this is a clear advantage from the point of view of image and sound quality, it creates some problems if we consider that each film print is not only the carrier of an image, but also an object that is able to bear the traces of its own history. The nature of digital images reconfigures our perception of analog film technology, insofar as their "presentness" contrasts with the historicity that each film print carries with it. In other words, digital technology applied to preservation changes our relationship with the history of moving images. In a way, it re-historicizes them by placing them in an undifferentiated present.

The consequences of this change might not be immediately visible in the experience of cinema. In a movie theater, very few spectators will be aware of the changed condition of the object that is projected on the screen. Actually, digital restoration offers a much more precise

simulation of the look of old film stock than photochemical reproduction does, somehow enhancing the spectatorial experience. In this respect, I believe that digital preservation offers a perfect example of the resilience and flexibility of the concept of "cinema" rather than decreeing its end. However, the concept of cinema is not limited to the spectatorial experience. Cinema is made of objects, be they analog or digital, as much as it is made of images. The diffusion of digital images has already fostered a new awareness of the physicality of film in a way that may bring cinema closer to other visual arts. Film archives must be at the forefront of this quiet revolution. In fact, in the digital era, the future of analog films may stand in their relevance as archival objects – that is, as the embodiment of a set of technological and historical peculiarities that are not reproducible. The potential of the investigation of films as archival objects is at the core of the next two chapters.

Chapter 2

Film As Archival Object

Analog Film Materials and the Evidentiary Value of Archival Holdings

In earlier times… [i]f repairs were needed, if ambition or piety pricked on to change, that change was of necessity wrought in the unmistakable fashion of the time: … [b]ut every change, whatever history it destroyed, left history in the gap, and was alive with the spirit of the deeds done amidst its fashioning.
William Morris[1]

The power and dangers of the digital preservation of analog moving images, as laid out in Chapter 1, are unprecedented in the history of film preservation and of cinema in general. The potential for manipulation of moving images, the creation of digital events, and the re-historicization of digitized films are new challenges that scholars and archivists must face when thinking about the ontology of contemporary cinema. However, digital preservation also functions as a lens through which to rethink analog preservation and analog cinema in general: its potential for simulation reveals the many forms that "simulation" assumes as an act intrinsic to the creation of faithful reproductions. According to Giovanna Fossati, all restorations are simulations regardless of their output carrier.[2] Modern film stock simulates the look of obsolete film technologies – for instance, the restoration of a Technicolor print will necessarily lose the technological peculiarities of Technicolor insofar as the technology to produce it is no longer

1 William Morris, "Restoration," in Stephan Tschudi-Madsen, *Restoration and Anti-Restoration: A Study in English Restoration Philosophy* (Oslo: Universitetsforlaget, 1976), 144.
2 Fossati, *From Grain to Pixel*, 140-145.

available. In this respect, what I said in my previous chapter about the loss of a complete indexical relationship between a film print and its digital copy also holds true in the case of a 'film-to-film' preservation. Elements that are unique to a print, such as edge codes, chemical composition of the emulsion or film stock, size and shape of perforations, splices, scratches, and so on, cannot be reproduced. This is a necessary consequence of the twofold nature of film, which gives the illusion of infinite reproducibility but renders impossible the exact reproduction of the material nature of individual objects. Reproduction is intrinsically an act of simulation.

These elements of continuity between analog and digital preservation unveil the complexities and the contradictions of the era that is usually labeled simply as "analog cinema." The blanket term "analog" obscures the variety of different technologies that have little in common witch each other, except for being analogical – analog video, or the countless types of sound recording technologies, are perfect examples. Even within a single type of technology (e.g. motion picture film), the elements of discontinuity are numerous and should not be overlooked. This misguided understanding of analog technology as a homogeneous entity is a direct consequence of the way in which the discourse on digital has been constructed. We might even say that the concept of analog is in itself an invention of the digital era. As Thomas Elsaesser writes, "If the arrival of the digital pixel "created" the concept of the post-photographic image, the consequence was that it also changed the meaning of photographic realism."[3] If we shift the emphasis from the photographic image to film technology, we see that a similar mechanism has been in place – a mechanism that creates a stark analog-digital binary, while also constructing an artificial idea of "analog cinema" as a coherent and stable space that functions

3 Elsaesser, "The New Film History As Media Archaeology," 90.

exclusively as a mere backdrop for theories on digital technology. This clear-cut opposition is questioned by digitally preserved films, which retain their analog origin in their content, but are fully digital objects – unless they are recorded back onto film stock, which would complicate their hybrid status even further. In light of the theoretical challenges posed by the practice of digital preservation, it is necessary to reconfigure the concept of analog cinema itself. I will argue that digital preservation opens up new ways for thinking about analog film in general and analog archival holdings in particular. My claim is that digital technology in general, and preservation in particular, have been instrumental in shifting the status of analog film from object of use to archival object, and that this shift has reconfigured the evidentiary value of film materials themselves.

Conceptualizing the Object

As I wrote in my first chapter, digital technology applied to preservation re-writes film history and places the digitized content in an eternal present, where it can be reproduced indefinitely without modifications to its nature. To put it differently, digital preservation re-historicizes moving images by placing them in a completely different technological realm, with a different materiality and a different mode of reproduction. However, it is key to understand that it is the content of the film that is transferred, and it is the audiovisual text of the film that is being reconstructed in the digital restoration and preservation process. The film materials that are being digitized do not undergo any physical change in the digitization process, and go back to their conservation vaults after they are scanned. In order to better understand these concepts, it is

helpful to briefly turn our attention to an archival practice in which they find a useful articulation: cataloging.

The *FIAF Moving Image Cataloguing Manual* distinguishes four levels of structuring of moving image records: work, variant, manifestation, and item.[4] For our purposes, it is sufficient to examine more closely the highest and lowest levels in the structure: work and item.[5] A work is "An entity comprising the intellectual or artistic content and the process of realisation in a cinematographic medium, e.g., what the moving image is called, when it was made, who made it, who was in it, what it is about, etc."[6] In other words, the work is the conceptual embodiment of a film.[7] The work is therefore an abstract entity, and yet it is the way in which film is most often discussed. When we talk about *Metropolis*, for instance, most likely we are not referring to a specific object, or version, or cut: we talk about a film titled *Metropolis*, written by Thea Von

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4 Natasha Fairbairn, Maria Assunta Pimpinelli, Thelma Ross, *FIAF Moving Image Cataloguing Manual* (Bruxelles: FIAF 2016), 3. Online access at http://www.fiafnet.org/images/tinyUpload/E-Resources/Commission-And-PIP-Resources/CDC-resources/20160920%20Fiaf%20Manual-WEB.pdf. The acronym FIAF stands for Fédération Internationale des Archives du Film.

5 For completeness, a variant is "An entity that may be used to indicate any change to content-related characteristics that do not significantly change the overall content of a Work as a whole. This is similar to a Work since it does not yet describe physical or digital embodiments of the content. For example: A film edited for television broadcast will contain most of the content of the original Work, but have some parts edited out." A manifestation is defined as "The embodiment of a moving image Work/Variant. Manifestations include all analogue, digital and online media." For instance, a 70mm re-release of a film originally distributed in 35mm will be a particular manifestation of the moving image work. Fairbairn, Pimpinelli, Ross, *FIAF Moving Image Cataloguing Manual*, 3.

6 Fairbairn, Pimpinelli, Ross, *FIAF Moving Image Cataloguing Manual*, 3.

7 Interestingly, the definition of "work" in cataloging language is the opposite of that given by Roland Barthes in his distinction between work and text, where "work" is a concrete object, definite, closed, and complete. See Roland Barthes, "From Work to Text," in *Image, Music, Text*, trans. Stephen Heath (New York: Hill and Wang, 1977); and Raymond Bellour, "The Unattainable Text," in *Screen* 16.3 (Autumn 1975).

Harbou and directed by Fritz Lang in 1927, in which a scientist builds a robot in the shape of a woman to initiate riots that will lead the city of Metropolis on the verge of class warfare. If someone asked me "Have you ever seen *Metropolis*?," I would probably answer yes, even if my interlocutor did not specify which version, and even though I have not seen every single version that has been created in the course of history. We implicitly agree upon the existence of a conceptual entity titled *Metropolis*, which comprises and exceeds all its actual manifestations, and which makes it possible to compare different spectatorial experiences.

At the opposite end of the structure, the item is "The physical product of a Manifestation of a Work or Variant, i.e. the physical copy of a Work or Variant."[8] Items are therefore a work's physical embodiments that are held at a specific archive. Archives often possess several items related to one work, and each of them is the material embodiment of that work at a specific time and place in history. For instance, the Murnau Stiftung may conserve an analog item of the 2001 restoration of *Metropolis*, a digital item of the 2010 restoration, as well as several items of some of the versions of *Metropolis* that have appeared throughout history. The Argentinian 16mm that served to reconstruct the nearly-complete version of the film is yet another item, conserved at the Museo del Cine in Buenos Aires. All these items, and many more conserved at different archives, are linked to the work *Metropolis* and represent its different physical embodiments.[9] The description of the item differs greatly from that of the work. Whereas in the case of the work

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8 Fairbairn, Pimpinelli, Ross, *FIAF Moving Image Cataloguing Manual*, 3.

9 These items are also physical embodiments of a work's manifestations - "2001 restoration," "2010 restoration," "Argentinian distribution copy." However, it is important to understand that a manifestation is still an abstract concept that designates how a work has appeared throughout its history, whereas the item refers to the material existence of a specific manifestation. What I am interested in is the physical dimension of the items, as opposed to the abstract one of the manifestations.

the description will contain mostly filmographic data (such as director, year of production, country of origin, cast, and so on), in the case of the item the description will list the physical attributes of the object (length, chemical composition of the film stock, format, aspect ratio, color/black and white, but also information related to the copy's conservation status, damage, decomposition, loan history, etc.).

The main concept that emerges from the cataloging structure used in film archives is, again, the double nature of film as both conceptual and material artifact. The work would embody the conceptual nature of film, the item the material one. But cataloging rules reveal more than that: being an abstract concept that is free from the physical constraints of matter, film as work is immutable, stable, and constant. Regardless of how many copies exist, how many versions have been released, or how many restorations are performed, a work stays the same. Even more interestingly, the survival of physical copies of a film is irrelevant to the existence of film as work. The Italian silent film *Sperduti nel buio* (*Lost in the Dark*; Nino Martoglio, 1914) is a famous case of "work without items." Despite the limited distribution that it had at the time of its release, the film accrued enormous fame over the years to the point that it was saluted by film critics in the 1930s as a precursor of cinematic realism.[10] *Sperduti nel buio* allegedly disappeared at the end of World War II, when the only surviving copy was lost after being seized by the German army during the occupation of Rome. The circumstances of this loss and the reputation that the film had acquired contributed to creating a myth surrounding *Sperduti nel buio*, a film that nobody who is alive today has seen, and yet is discussed as a masterpiece anticipating neorealism of three decades. Although most scholars agree that this judgement is

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10 See Umberto Barbaro, "Vecchi film in museo," in *Cinema* 68 (April 25, 1939).

most likely an exaggeration, the aura surrounding *Sperduti nel buio* is still so persistent that in 2014 a documentary following the steps of an archivist in search of the lost print was produced and distributed in the festival circuit.[11]

The case of *Sperduti nel buio* helps us understand the pervasiveness of the work, and its stability in the face of historical accidents.[12] Granted, there are rare cases in which it is necessary to rethink and modify information related to a work – when new archival findings allow to identify the author of a previously unattributed film, for instance. But the concept of work tends toward a state of stability and completeness, insofar as new information does not create a proliferation of works, but rather redefines more precisely the work itself – at least ideally.

The cohesiveness of the work contrasts with the fragmentary nature of the concept of item. While a work is stable and unique, an item is only one of several objects that pertain to a certain work and that can be related to each other in manifold ways. An archive might own several prints of a film, struck at different stages in history from the same source or from different sources. Some of those copies may be dubbed, or have titles and intertitles in different languages. Some may be early generation copies, others may be farther from the camera negative and therefore of lesser quality. Some may be complete, others may present gaps due to censorship, degradation of the physical support, or missing elements. Prints may be in different

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11 *Sperduti nel buio: storia di un film che c'era e non si trova più, e di un cinema che non c'era ma che si voleva fare a tutti i costi* (Lorenzo Pezzano, 2014).

12 I called *Sperduti nel buio* a work without items. This definition is helpful for understanding the relationship between a work and an item, but is not completely accurate, insofar as some items related to the work do exist – still photographs, for instance. After all, if there were no surviving items whatsoever, no archive would need a filmographic record of *Sperduti nel buio* because there would be no items to link to it in order to be cataloged and retrieved. It would be more accurate to define this case as "work without film items."

formats and film stocks, and have different types of emulsion. In addition to prints, archives may also hold different types of film materials – negatives, workprints, outtakes, trailers, censorship cuts, soundtrack-only positive or negative copies, and so on. Each of these materials will constitute a separate item, and shall be cataloged separately.

Each item represents the various forms that a work acquired at different stages in history, and, conversely, the sum of all the items represents the incarnation of a work in all its material complexity. Obviously, an archive's catalog would only list the holdings of that particular archive, and not the totality of the existing items related to a certain work. However, adopting the lens of moving image cataloging to articulate the relationship between the conceptual and the material nature of film can be enlightening. The basic account of an archive's cataloging structure that I proposed shows how a work remains a singular and coherent entity, regardless of the historical misadventures that a film may have faced, whereas the item is caught in a tension between the individuality of the item itself (each item is different from the others, and has its own cataloging record) and the plurality of the concept of item, which presupposes a proliferation of copies of a certain work in order to acquire meaning. In other words, if an item is a singular entity, it is so in light of its relationship with all the other items that are linked to a certain work.

An example may be helpful to clarify this concept. Orson Welles' *Mr. Arkadin* (1955) is one of the most complex cases of multiple versions of a text in film history. In an article from 1992, Jonathan Rosenbaum lists seven versions of *Arkadin* that are known to exist, or have

existed at some point in history, each with a different cut.[13] Three of them were released with the title *Confidential Report*, and the Spanish version (which exists in more than one variant) presents different footage from the main production, featuring Spanish actresses in the roles of Sophie and Baroness Nagel.[14] None of these versions were approved by Orson Welles, and some of them include footage shot by other directors. As of today, eight versions of *Arkadin* exist, the most recent being the one created by scholars Stefan Drössler (Munich Film Archive) and Claude Bertemes (Cinémathèque de la Ville de Luxembourg) for the release of the Criterion DVD box set *The Complete Mr. Arkadin* in 2006. This so-called "comprehensive version" includes as much of the footage that Orson Welles shot as possible, so creating a version that never existed before, but that aspires to be the most faithful reconstruction of what Welles supposedly had in mind.[15]

The concept of "version" is still an abstract one; however, it refers to the shape that a work assumed at a certain point in history, and is therefore strictly related to the material existence of a copy with certain characteristics that distinguish it from what the ideal work is supposed to look like – even though such copy may no longer be extant. In the case of *Arkadin*, the *FIAF Moving Image Cataloging Manual* considers these eight versions as variants of the work titled *Mr. Arkadin*. *Confidential Report* is listed as the title of three of these variants rather than a different work, despite the differences in editing, footage, soundtrack, and even title.

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13 Jonathan Rosenbaum, "The Seven Arkadins," in *Film Comment* 28.1 (January 1992): 50-59.
14 Ibid., 58.
15 Rosenbaum, however, questions the faithfulness of the Drössler – Bertemes version on the basis of their supposed disrespect for Welles' own editing. See Jonathan Rosenbaum, "Welles' Anguish and Goose Liver: CONFIDENTIAL REPORT" (December 2000), available at http://www.jonathanrosenbaum.net/2010/12/22958/. accessed March 9, 2017.

Although Orson Welles did not approve any of the versions that have been released, he is still considered the author of the work.[16]

A case like this is helpful to understand the relationship between the conceptual and the material nature of film. Despite the proliferation of different versions, and the fact that an ideal *Arkadin* as Orson Welles intended it to be never existed, there is still the drive to conceptualize film as something immutable, unique, and clearly definable. In a way, cataloging serves as a mirror of the desire to tame the material nature of film and lead it back to a state of ideal perfection and immutability, which is embodied in the concept of work. Creating a common ground for all the physical manifestations of a certain film makes it possible to understand and discuss the work without being lost in its material fragmentation.

The materiality of film, though seemingly obliterated by the abstraction of the work, cannot be escaped in the process of preservation, restoration, and reconstruction. In fact, these practices offer a privileged perspective on the complexity of the material nature of film, and on its consequences of our understanding of cinema as a whole. When Stefan Drössler and Claude Bertemes embarked on the reconstruction of *Mr. Arkadin*, they did not deal with versions in the abstract sense of the term: they worked on physical objects. In other words, they collected and reproduced physical items from several archives, in order to create a new version that, in itself, would create a new item. An interview released by the technical director of Criterion, Lee Kline, shows how the material nature of film affected the reconstruction work:

> Kline says their quest involved going back to all the source material – two 35mm internegatives in Spain, an original camera negative in France ("cut up beyond belief") and a fine-grain dupe positive that documented a different cut made from the

16 Fairbairn, Pimpinelli, Ross, *FIAF Moving Image Cataloguing Manual*, 24.

> negative. The team also looked at the 16mm Corinth version Bogdanovich discovered in the U.S. in the '60s, which was named after its owner, Corinth Films. "That turned out to be very important as it was clearly very similar to what Welles probably wanted," notes Kline. However, there were major problems with this version. "It was worn and used and scratched, and it also had a major shake problem," he adds. But each version contained shots that were missing from the others. "So we had to go through each version very carefully, and then, if we found a duplicate of a particular shot, we had to determine which was the better quality [version]," says Kline.[17]

This account of the materials used for the reconstruction of the comprehensive version of *Mr. Arkadin* is helpful for understanding not only the centrality of the material nature of film in any preservation or reconstruction work, but also how the materiality of film determines and modifies its transformation into a conceptual artifact. Firstly, the material nature of film determines its modifications as a physical object in the course of time: the original camera negative retrieved in France was "cut up beyond belief," and the Corinth version was "worn and used and scratched, and it also had a major shake problem." What emerges here is the different ways in which history imprints its own passage on film objects. On the one hand, there are cuts on a camera negative – that is, a conscious operation on the part of producers or distributors to modify the text of the film by operating on the material artifact in which it is embedded. On the other hand, there are scratches and wear, inadvertently caused by the prolonged use of the print. But there is also a "major shake problem," presumably caused by a high degree of shrinkage of the film base: in this case, no human intervention, whether conscious or not, was needed to modify the physical properties of the object. Film tends to shrink with time, especially (but not exclusively) if stored in conditions of high temperature and humidity.

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17 Ian Blair, "Reconstructing Orson Welles. Criterion Goes To the Source(s) for Three Different Cuts of *Mr. Arkadin*," in *studiodaily* (Feb. 1, 2006). Available at http://www.studiodaily.com/2006/02/reconstructing-orson-welles/ Accessed March 11, 2017.

Therefore, the preservation and reconstruction team that worked on *Mr. Arkadin* had to face the consequences of the passage of time on the film objects in order to create a version that would be not only closer to Welles' wish in its textual dimension, but also pleasing to watch as regards the quality of the photographic image. These two aspects are not unrelated. In fact, the passage of time does not modify only the physical characteristics of film; it also changes aspects of its conceptual nature. The 16mm Corinth version of *Mr. Arkadin*, which was considered the closest to Welles' idea of the film, would become in the reconstruction only one of several materials used to assemble the "comprehensive version." Even more interestingly, due to its poor physical condition and photographic quality, in the comprehensive version the restorers "replaced probably 99 per cent of the 16mm material with much better 35mm material."[18] Therefore, the Corinth version became a model for the editing structure of the film, rather than one of the source materials to be duplicated in the reconstruction process. While this copy was key for understanding what Welles presumably had in mind as regards the narrative structure of the film, it was nearly useless in the technical work on the new version.

This shows that the material and the textual nature of films are indeed related, but in more complex and fluid ways than one might expect. The complexity of this relationship depends, again, on the mechanical reproducibility of film and on the consequences that this aspect of cinema has on its conceptual nature. Since, according to Lee Kline, 99 per cent of the Corinth version was replaced during the duplication process with materials of higher photographic quality, can we still say that the resultant print (or file, since the *Arkadin* materials were actually scanned) is mostly based on the Corinth version? The answer would be yes, if one

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18 Ibid.

considered the textual dimension of the Corinth version; but it would be no, if one considered its material dimension. Both answers would be correct, depending on the perspective adopted.

This mechanism is even clearer in the case of *Metropolis*. As Martin Koerber writes with regards to the countless attempts to reconstruct longer versions of the film, "It is difficult to trace the history of these [restoration] efforts, because many of these versions were never precisely documented, at least up until now. By comparing the many different copies stored in the world's film archives, it has however been possible to deduce from the film material itself the changes made to the film, as well as the attempts to reverse those changes."[19] In this case, film prints become evidence of the shape of *Metropolis* at a certain point in history, and their material examination allows the researcher to reconstruct the steps taken by the (official or unofficial) restorers, so that it is possible to determine whether an intervention was aimed at changing the film, or at reversing changes that were previously made. As documentation is a recent requirement in film preservation, these copies are the only existing elements that can be used to reconstruct this history, and their material examination is key to collect the necessary information directly from the film prints. Even the more famous preservations of *Metropolis* take part in this mechanism. When *Metropolis* was restored in 2001, curator Martin Koerber decided to use different elements from those that serves as source materials for Enno Patalas in 1987. Being able to compare different copies, Koerber came to the conclusion that the materials used by Patalas were not the best available, both in terms of photographic quality and in terms of continuity.[20] Therefore, the 2001 preservation differs from the 1987 not only in length, but also

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19 Koerber, "Notes on the Proliferation of *Metropolis*," 128.
20 Ibid, 135.

as regards the materials used, and the very materiality of film (its photographic quality, its physical conditions) determined the choice of elements to be used for the 2001 preservation – which, in turn, will become only one of the elements used for the 2010 digital preservation.

These examples shed light on several key aspects of the relationship between film preservation and film history, and show how dependent it is on the relationship between the material and the conceptual dimension of film. First, what emerges is that preservations insert themselves in the history of a film as some of the elements in the proliferation of its copies, rather than as the definitive version of that film. The principle guiding a preservation work may be different than those guiding standard duplication, but the effect is the same. New copies are created, and they acquire a life of their own in the course of history. The 16mm Corinth version of *Mr. Arkadin* (a reduction print with no preservation ambitions) and the 2001 restoration of *Metropolis* (created with the goal of bringing back to life a lost masterpiece) would both eventually become source elements among others in more recent efforts to restore and preserve the two films. This shift is conceptual, rather than material: although the physical characteristic of those copies were not modified by the preservation work, the way in which the Corinth version of *Mr. Arkadin* and the 2001 restoration of *Metropolis* are perceived and discussed today is different than it was at the time of their release.

This leads to the second point: the relationship between the conceptualization of the object, the conceptualization of film, and the conceptualization of cinema as a medium. What emerges from the discussion of the preservation history of *Mr. Arkadin* and *Metropolis* is the difference between film as work (the abstraction of a certain film as a coherent and stable entity in the face of historical accident) and film as object (the actual embodiment of a certain film in a

number of copies – items – held at specific archives). But the material nature of film as object does not prevent its conceptualization – in fact, it invites it. As much as the print of the 2001 restoration of *Metropolis* is an object, it is also the embodiment of an idea that is not constant, as in the case of "film as work," but shifting with the passage of time. If in 2001 that print was conceived, thought about, and discussed as the most complete possible version of a work of which the most complete embodiment (the copy that premiered in Berlin in 1927) was lost, today that same print represents a historical document of the state of the scholarship on *Metropolis* in the early 2000s, of the preservation work made on *Metropolis* up to that point, of the shape that the work *Metropolis* assumed at that point in history, and also of the restoration technology available at the dawn of the new millennium. These concepts derive from the material existence of a copy of that version, but exceed its materiality to become ideas. The key point is that the unmodified condition of the physical copy (or copies) of a film does not prevent the shifting conceptual status that the same copy has acquired throughout the years.[21]

This complex relationship between material and conceptual has important consequences on our broader understanding of cinema as a medium. Giovanna Fossati was among the first scholars to include archival practices into the larger discussion on the ontology of cinema. In this context, she coined the expressions "material film artifact" and "conceptual film artifact" that I have been at times referring to throughout this project. At this point, it is necessary to explore

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21 By "unmodified condition of the physical copy," I do not mean that the print in question does not undergo any physical changes. All film materials are subjected to physical modifications with the passage of time. Rather, I want to emphasize that the shifting conceptual status of an object can be independent from its physical changes, and especially that the status of an object can change regardless of any physical modifications consciously operated on the object itself.

these concepts more in depth, and to examine their consequences not only on the "archival life of film," as the title of her seminal book suggests, but also on the current status of cinema in general. Fossati writes: "The material film artifact is typically the film preserved by the archivist, whereas the conceptual film artifact refers to its abstraction as an historical and aesthetic object."[22] This elaboration is certainly helpful to distinguish between the two different but interconnected elements that compose the nature of cinema as a medium: there would be nothing to conceptualize without the existence of materials, and materials alone would be meaningless without a conceptualization, as informal and colloquial as it may be. However, I believe that it is necessary to push on this distinction to understand its consequences to the fullest extent.

Although it is true that the "conceptual film artifact" refers to an abstraction, it is helpful to identify exactly what it is that gets abstracted, and in what ways. By taking into account the relationship between material and conceptual artifact, it is possible to distinguish three levels of abstraction. The most general is that of cinema itself. As the intersection between objects and practices, what we call "cinema" is the conceptualization of the relationship between films, apparatus, and spectators. The second level is what I have defined as "film as work" – that is, the conceptualization of a particular title independently from its material manifestations. For instance, *Metropolis* as work is an abstraction that is closely related to the several copies of the film scattered around the world, but that cannot be identified exactly with any of them. The third level would be the conceptualization of the individual objects themselves, and of their shifting status in the course of history. Again, in the case of *Metropolis* this level would be occupied by all the copies of the film, and each of them would acquire a different status at different stages in

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22 Fossati, *From Grain to Pixel*, 105.

history. This level is what constitutes the conceptualization of the object.

These three levels are of course intimately interconnected, and they influence each other in manifold ways. The "conceptualized object" is necessary to the existence of a work, even though the work itself is an abstract entity. At the same time, film objects are an integral part of cinema as a medium, and the way in which they are conceptualized has an influence on our understanding of the higher level of "cinema." This leads us back to one of the initial questions of this dissertation: where is cinema? Or, to put it differently, which is the aspect that more fully embodies the idea of cinema? As I suggested in Chapter 1, the answer to such a question would be different depending on the perspective adopted – the essence of cinema can be located in exhibition practices, in social discourses, in technology, in the films themselves. The interconnectedness of these elements is certainly what makes cinema the most influential medium of the twentieth (and twenty-first?) century, but placing the emphasis on one aspect rather than another would give back a different vision of cinema, and a different understanding of its role at the present stage in history.

According to Giovanna Fossati, cinema as a medium is inherently in transition, regardless of which technological stage of its history one examines. This is because the conditions in which cinema finds itself are constantly changing, both from a technological and from a cultural perspective, and cinema is able to adapt to the shifting context of which it is part at different stages in history. However, if one places the emphasis on "cinema" as the result of the relationships between the material objects that comprise cinema as a technology (films, projection apparatus, duplication equipment, and so on), I believe that the current state of transition, that from analog to digital technology, offers a privileged perspective on aspects of

cinema that have been mostly overlooked in studies on the ontology of the medium. The digital preservation of analog moving images, as discussed in Chapter 1, is the *locus* where the effects of this transition become more apparent and fascinating. Although the material nature of cinema is definitely not limited to the film strip, I will focus my discussion on this element, as it is the one that is more directly and deeply affected by the shift to digital technology both in practical and conceptual terms.[23] The key consequence of the transition to digital is the supposed obsolescence of film technology and materials.

Rethinking Obsolescence

On November 26, 2000, *The New York Times* published an article titled "The Movies' Digital Future Is in Sight and It Works."[24] The author joins the wave of early digital enthusiasts by praising the new technology's image quality, reliability, and cost-effectiveness, in addition to the freedom that it would supposedly offer to independent filmmakers and exhibitors. The most interesting aspect of this article, though, is not the text as much as the image that accompanies it. A group of Studio and industry executives, dressed in suit and tie, cheerfully dumps bulky film cans into a garbage bin labeled "OBSOLETE." The caption of the photograph reads: "A press conference about converting to digital the AMC Empire 25 in Times Square 200 includes, from

23 Giovanna Fossati herself, together with Annie Van Den Oever, edited a book collection dedicated to the evidence offered by material objects related to the film apparatus: see Giovanna Fossati and Annie Van Der Oever (eds), *Exposing the Film Apparatus. The Film Archive as a Research Laboratory* (Amsterdam: Amsterdam University Press, 2016).

24 Rob Sabin, "The Movies' Digital Future Is in Sight and It Works," *The New York Times*, November 26, 2000.

left, Mark Gill, president of Miramax Films / L.A., Bob Lambert Sr., vice president new technology for Disney; Jim Albaugh, president of Boeing Space and Communications Group; Frank Rash, vice president of AMC Theaters; and Ron Maehl, senior vice president of Boeing Satellite Systems." The purpose of this image is clear: in a symbolic gesture, the executives are dumping the photochemical past of cinema into the space that is proper to it, that of obsolescence. Such a space can only be a garbage bin, as obsolescence renders object useless and dismissible – or, to be dismissed to make room for new objects. However, in all its symbolic clarity, this image obscures one key fact while flaunting it at the same time: for whom is film obsolete? Or, to put it more bluntly, *cui prodest*? Who takes advantage of it? The image caption is enlightening: to throw film into the garbage bin of obsolescence are representatives of major Studios, powerful theater chains, and high-tech industry (Boeing, as the article explains, partnered with Disney to launch an orbiting satellite that would bounce off digital audiovisual files to movie theaters). Regardless of what one might think of this operation of technological renewal, one thing is clear. Obsolescence is an industry-driven concept, rather than an unavoidable consequence of progress.

In his book *Obsolescence: An Architectural History*, Daniel M. Abramson examines how a similar mechanism played out in the architectural development of twentieth century America. In the first part of his book, Abramson reconstructs the history and the causes of the rebuilding frenzy that transformed America's major cities during the first two decades of the 1900s. New York, Chicago, San Francisco, Atlanta: one after the other, all these cities witnessed a fast-paced cycle of destruction and rebuilding of their most representative buildings, sometimes as soon as

five years after their construction.[25] What were the reasons behind the decision to tear down perfectly functional buildings shortly after their inauguration? To answer this question, studies on architectural obsolescence were promoted already in the 1910s. Unsurprisingly, the answer had nothing to do with the buildings *per se*, but rather with their capacity to generate a profit. Abramson writes:

> Obsolescence, it was surmised, came about as a result of changing technology, economics, and land use, in which the new would inevitably outperform and devalue the old. Obsolescence's basic axioms were that architectural function and worth were quantifiable and necessarily decreased over time.

In addition to this, a key factor in the rebuilding drive were corporate tax regulations that made it advantageous to scrap and rebuild perfectly functional constructions, rather than update them to the latest fashion or technology. This combination of technological and economic factors shows that obsolescence in architecture is anything but a neutral phenomenon, even less a natural or unavoidable one. In fact, corporations not only found several ways to take advantage of the obsolescence of buildings; they invented the concept of architectural obsolescence itself, borrowing the term from other areas of industrial history. Although the use of the word "obsolescence" to indicate an architectural phenomenon is first attested in the 1910s, the history of the concept in different fields has a much older origin. As Abramson explains,

> The term [obsolescence] was used first in sixteenth-century England to describe human speech "growne out of use," then in the nineteenth century to describe an organism's loss of function, before also encompassing inanimate machinery's loss of utility. In this newly understood process an object's material integrity holds fast— it is still young and operates as intended— but its functional worth has declined.

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25 Daniel M. Abramson, *Obsolescence: An Architectural History* (Chicago: University of Chicago Press, 2016), 1.

> Something better has come along to devalue and supersede it, to make it expendable and disposable.[26]

As this account suggests, twentieth-century architectural obsolescence is a step forward from what the concept entailed just a few decades earlier. The new obsolescence does not indicate merely the aging of an object, or its loss of functionality. As the example of the architectural renovation of American metropoles in the early twentieth century attests, paradoxically neither of these things are necessarily what makes an object obsolete. A new and functional building can still be deemed obsolete if a return on financial investments makes it advantageous to do so. The implications of this twentieth-century conception of obsolescence are even more fascinating if one looks at how buildings used to become obsolete in the past. In Abramson's words,

> [T]he kind of impermanence found in obsolescence is a process of devaluation imposed upon architecture that is not intentionally short-lived, unfinished, or lightweight. Before the twentieth century, buildings were subject to obsolescence, to be sure: Renaissance fortifications, for example, became outmoded owing to developments in siege technology. But not until the twentieth century did obsolescence come to be understood as a general condition of change in architecture and cities as a whole— a relentless, universal, impersonal process of devaluation and discard.[27]

As Abramson writes, obsolescence is a process of devaluation that is *imposed upon* architecture, rather than being a characteristic acquired in time by architecture itself. Older forms of obsolescence, such as that of Renaissance fortifications, were caused by external changes that rendered that particular form of architecture no longer useful. Modern obsolescence is instead built upon an ideal of *impermanence* that was absent (or marginal) in older times. Unlike what

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26 Ibid, 15.
27 Ibid, 5.

was the norm until the end of the nineteenth century (exception made for constructions such as pavilions and fairs, which were meant to be temporary), in the early twentieth century buildings were constructed with obsolescence already in mind. Interestingly, it was not until this modern idea of impermanence emerged in the twentieth century that the term "obsolescence" started being applied to architecture.

This modern process of "devaluation and discard" of obsolete-labeled buildings is at odds with an opposite drive that emerged in the nineteenth century: that of valuing the historicity of older building and safeguarding it from the passage of time. As Philip Rosen suggests in his book *Change Mummified: Cinema, Historicity, Theory*, this desire can be broadly summarized in the tension between two contrasting tendencies: restoration and preservation.[28] The restorationists, famously championed by Viollet-Le-Duc, theorized an intervention aimed at restoring the properties of a building as it was supposed to look like at the time of its construction. As Rosen explains,

> Viollet-Le-Duc became associated with a general line whose theoretical slogan was *l'unité de style*. With historical learning and research, the architect could ascertain the dominant style in which the building had been originally intended, or at least hypothetically infer the one that was most probable in the period of the original construction. He argued that modern architects should restore buildings as aesthetically valid entities according to these unifying stylistic tenets, derived from a periodization of architectural history.[29]

For the restorationist movement, therefore, the guiding principle was the ideal of "unity of style" – the style in question to be inferred from the period of the original construction. As

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28 Philip Rosen, *Change Mummified: Cinema, Historicity, Theory* (Minneapolis: University of Minnesota Press, 2001).
29 Ibid, 47.

Rosen points out, this idea is far from being neutral and unproblematic. For instance, what to do with buildings whose original construction took centuries? Which would the "original style" to be restored be, in this case? The risk is that of creating an architectural artifact that actually never existed in that style. Furthermore, the choice of the "original style" to restore is unavoidably influenced by the taste and fashion of the era in which the restoration takes place. In the first half of the nineteenth century, the period in which Viollet-Le-Duc was writing, the most beloved style was the medieval one – or the modern interpretation that the Gothic revival gave of it. The choice of the style to restore is therefore more dependent upon the taste of the time in which the restorers operate than the style (or styles) of the restored buildings themselves.

In response to the restorationist movement, an opposite architectural ideology emerged by the second half of the nineteenth century, notably in Great Britain. The earliest advocates of the resistance to the dominant restorationist practices were art critic John Ruskin and artist William Morris – the latter also leader of The Society for the Protection of Ancient Buildings, founded in 1877. This resistance was driven by a "preservationist" impulse, that is, by the will to preserve buildings in the conditions in which they stood, rather than restoring them to an ideal, and often fictitious, "unity of style." The goal was that of preserving the traces that time left on architectural artifacts, including later interventions, manipulations, insertions of more recent architectural elements. The idea guiding the preservationist position is that "in restoration, new construction becomes destruction. To replace what succeeding ages have added to a building […] was in effect to evacuate historical actuality."[30] Rather than focusing on the stylistic coherence of a building, the preservationist approach privileges its historical nature as the bearer

30 Ibid., 48-49.

of signs left by the passing of time. What matters for a preservationist is therefore the history that is embodied by any architectural artifact, and any attempt to restore a building to an idealized pristine condition would have the effect of erasing that same history.

The ideological opposition between the restorationist and the preservationist positions, though fascinating, is too complex to thoroughly account for here. However, it is key to point out that both approaches, in their differences, share an interest in history and temporality that seems to be absent in the construction of obsolescence as the guiding principle for architecture in early twentieth-century America. As Rosen argues, both the restorationist and the preservationist approaches attempt to access history through different conceptions of temporality embodied in architecture. He writes:

> For the restorationist, time was conceived as a directional series of segmentable points, such that the best access to history became the rational, inferential re-construction of a given point or sequence of points based on evidence available in the present. For the preservationist, time was a continuous, uninterruptable flux, so that the best access to history became a more experiential sense of the unending flow of time through objective remains from a vanished past.[31]

The restorationist and the preservationist models are therefore characterized by opposing views on temporality and history, and on how to access them through architectural interventions on ancient buildings. Nonetheless, the very interest in this issue is what sets them apart from the conception of obsolescence that Abramson describes in his book. Whether by recreating an ideal "original style" or by preserving the existing conditions of a building, both approaches value the pastness embodied by architectural artifacts, and strive to either recreate it or crystallize it as it was given to the present by history. It is helpful to interpret the relationship between proponents

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31 Ibid., 56-57.

of the restorationist/preservationist approach and advocates of the destruction of obsolete buildings not in chronological terms (although the second attitude emerged later), but rather as a tension between two impulses that can coexist and that are embodied by different social actors in contrast with one another. This needs to be kept in mind in order to understand how this framework can be helpful for reconfiguring the relationship between history, obsolescence, and film preservation.

It would be tempting to see a parallel between restoration and preservation in architecture and in film. However, such a parallel would be misleading. The definition of "restoration" and "preservation" in film, as laid out in Chapter 1, does not overlap with the meaning that these terms have in architecture. Granted, it is certainly possible to adapt the contrast between the restorationist and the preservationist impulse to film. One example would be the 2010 restoration of *Metropolis*: the choice to keep the scratches and the dirt in the frames inserted from the Argentinian 16mm copy would go in the preservationist direction, showing the desire to not erase completely the traces that time and use left on the film strip. On the other hand, the digital restoration of *Pandora's Box* (Georg Wilhelm Pabst, 1929) can be ascribed to the restorationist side – the restored print looks pristine, showing no signs of wear and tear whatsoever. To adapt an art history term to film preservation, while the restorers of *Metropolis* decided to maintain the *patina* of the film, the restorers of *Pandora's Box* chose to erase it to make the film look immaculate, as it probably was at the time of its first release.[32]

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32 For a brief history of the restoration of *Pandora's Box*, see "The Preservationist and the Playboy: Restoring *Pandora's Box*," available at http://silentfilm.org/archive/the-preservationist-and-the-playboy-restoring-pandoras-box (accessed April 14, 2017). However, a screening of the preserved print is the best way to determine the restorationist position

Nonetheless, I believe that is it more helpful to determine in what ways film preservation differs from similar discourses surrounding architecture before attempting a parallel between the two practices. The main difference stands in the outcome of the restoration/preservation work: while architectural interventions operate modifications on the buildings themselves, the product of a similar intervention on film will always be a copy. Is it helpful to talk about a contrast between a restorationist and a preservationist impulse in cinema, then? The answer will depend again on where we place "cinema." If "cinema" is what an audience sees projected on the screen, then the difference between the two approaches will be meaningful, and will have important consequences on how a film is perceived, experienced, remembered, talked and written about. Seeing the restoration of *Metropolis* and that of *Pandora's Box* projected would definitely show the difference between a preservationist and a restorationist approach to film (although the distinction is not so clear-cut). This difference would have an influence on how the two films are experienced, as well as repercussions on how one judges either curatorial decision. However, if we shift the emphasis from the performative aspect of cinema to the objects themselves, this distinction becomes more blurred and overall less influential. Creating a new object (i.e. the preservation print) does not erase the history embodied in all the film objects that were created before. Rather, it contributes to that history. Giovanna Fossati, following the lead of William Uricchio, argues that

> archived films in general, and their restorations in particular, are first of all "historized artifacts." Restorations of archival films are not original film artifacts shown for the first time to an audience, but, conversely, artifacts that have been historized both on a material level (e.g. the film has been damaged by projection and

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taken during the restoration process of the film.

> chemical instability is causing decay), and on a conceptual level (e.g. the film is a product of its own time as the people who restore, study, and watch it).[33]

What Fossati is arguing is that a restoration is not a neutral operation of recovery of a film as it was, but rather the result of curatorial choices that depend both on the material conditions of the film to be restored and on the historical context in which the restoration takes place. However, I believe that Fossati's point needs further elaboration. In what way is the restoration of an archival film historicized? Also, when does this process of historicization take place? Immediately when a restoration is performed and released, or later on, when a certain chronological distance allows us to perceive and appreciate the peculiarities of a restoration compared to other restoration tasks – both of the same title and of different titles? The historical context of a restoration, as well as the background, taste, and ideas of the curators, would of course have an immediate effect on the look of a restored film. In this respect, any restoration is the product of a particular time and place. However, there is also another way in which film artifacts are historicized. The comparison between restorations of archival films and "original film artifacts shown for the first time to an audience" would suggest that a temporal separation is needed in order for an artifact to be historicized, both on a material and on a conceptual level. A certain distance is necessary in order to fully appreciate all the influences that play a role in curatorial decisions. At the same time, only the vantage point of the present allows us to estimate the impact of the historical conditions in which a film was experienced in the past. In both cases, not only changed historical conditions, but also the shifting conceptual status of individual

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33 Fossati, *From Grain to Pixel*, 104-105. The quotation that serves as the starting point for her elaboration on the historicity of film can be found in William Uricchio, "Historicizing Film in Transition," in David Thorburn and Henry Jenkins (eds), *Rethinking Media Change: The Aesthetics of Transition* (Cambridge, MA: MIT Press, 2003), 30.

objects, are what constitute the historicization of a film artifact.

A temporal separation would also have an effect on the material conditions of the preserved film, insofar as no film object is immune from the effects of the passage of time.[34] In this sense, a preserved film enters the realm of "archived films" as an artifact that is continuously re-historicized as its material conditions change alongside historical ones. In this sense, Fossati's separation between historicized material artifacts and historicized conceptual artifacts can be confusing. In her account, the former would be the physical print that is subject to restoration, and the latter would be an abstraction closer to the concept of "film as work" than to the concept of "film as item." I would instead suggest that "film as item" is also an object that can be conceptualized by accounting for its historicity as both text ("the film [as] a product of its own time as the people who restore, study, and watch it") and material artifact (the film in its physical existence, with its technological peculiarities and the material traces of the passage of time that it bears). It is in this sense that each and every film print, be it a camera negative, a small-gauge reduction, or a preserved print, is in itself an original. Seeing film under this light allows for a different understanding of the digital turn, and of the obsolescence of analog technology that it supposedly triggers.

As we saw, the term "obsolescence" in architecture refers to the practice of tearing down and reconstructing buildings that were deemed no longer lucrative enough. Since cinema is based on mechanical reproducibility, this concept cannot be applied to film in the same way. When a new copy of a film is created, older materials belonging to the same title are not destroyed, but

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34 I have used the terms "preserved" and "restored" here in the film-specific sense of the words. If the emphasis is placed on the long-term survival of a restored film, the term "preservation" is more accurate than "restoration" - see my discussion on these terms in Chapter 1.

continue their existence in a different fashion. In other terms, their status shifts from objects of use to archival objects. The term "archival" is key here: the conservation of film materials is an archival practice, rather than an industrial one. The industry (or at least branches of it, since some Studios have archives and are committed to the conservation of older films that can be still economically exploited) is interested in promoting the obsolescence ideal in order to generate higher profits with the introduction of a new technology. At the same time, archives are forced to embrace the new technology, if anything in order to make sure that their titles can be screened in theaters that are only equipped with digital projectors, but are committed to the conservation of objects related to the older technology as well.

Film has always been an archival object, at least since the opening of film archives and cinématheques in the 1930s. And older films have always been considered disposable from the film industry (until they realized that it was possible to generate a profit from them), making the work of film archives all the more fundamental in preserving cinematic cultural heritage. Why would the shift to digital technology affect older films differently, then? As I suggested in my first chapter, the practice of digital preservation of analog moving images is the key to understanding this process. The digital shift has been really revolutionary on two different levels: while it was accompanied by the rhetoric of obsolescence of analog technology that was promoted by the industry, it was also operating a re-writing of film history at the archival level, through the digitization and digital preservation of analog films. I believe that it is key to distinguish between these two levels (and discourses) before understanding how they have been influencing each other. It is also possible to see these two different, though related, sets of problems in terms of the reconfiguration of the ontology of the medium that I proposed: where is

cinema? Is it in contemporary industrial practices and discourses, or is it in the objects stored in archival vaults? Is a synthesis between these two seemingly irreconcilable levels possible?

In order to attempt an answer to these questions, it is necessary to examine the two levels separately, starting from the higher one: the supposed obsolescence of analog film materials occasioned by the introduction of digital technology in contemporary media production, distribution, and exhibition. As the example of architectural obsolescence demonstrates, obsolescence is not a property of an object, but rather the result of a series of discourses surrounding the object in question. A building can be perfectly functional, even recently constructed, and nonetheless be deemed obsolete for reasons that go beyond the properties of the building itself. As Abramson shows in his book, this mechanism in architecture has fostered manifold reaction strategies challenging the very ideology at the base of the concept of obsolescence – most notably, the emphasis on discard and replacement gave birth to the sustainability movement, which proposes a completely opposite approach. A similar mechanism has been in place as regards film, albeit with some significant differences. The obsolescence of analog film has inspired artists who have started reflecting on the materiality of film stock at the moment of its demise. Tacita Dean, for instance, made a 16mm film recording the manufacturing of 16mm film stock at the Kodak factory in Chalon-sur-Saône, France, shortly before its permanent closing (*Kodak*, 2002). In describing her film, Dean said: "From a viscous blue solid to an evanescent transparency, the manufacture of film is a journey of sublime beauty, and one I would never have known were it not for its incipient obsolescence."[35] This statement can be read

35 Quoted in Theodora Vischer and Isabel Friedli (eds), *Tacita Dean. Analogue* (Basel: Schaulager, 2006), 8-9.

in two ways. More immediately, the incipient obsolescence of film gave Dean the impulse to make a film about the dying craft of film stock manufacturing before its end. At the same time, though, it is the obsolescence of analog film that turns an industrial practice into "a journey of sublime beauty." In other words, the impending death of film allows us to see its materiality in aesthetic terms, rather than in terms of functionality.

A similar mechanism, although not as explicit, is in place in Bill Morrison's *Decasia* (2002). A found-footage avant-garde film, *Decasia* is composed of numerous different segments of decomposing film stock assembled together with archival footage of film manufacture and processing. Morrison engages with issues of time, pastness, and mortality by exposing the decay of film stock at the very moment in which it was clear that analog film as a technology was on the wane. However, seeing *Decasia* as a metaphor for the end of an era, though probably not incorrect, is definitely limiting. By flaunting decomposing film segments, Morrison also shows what film can do that digital cannot: film can decay, so bearing the traces of the passage of time in its very physical existence, whereas digital decay usually just renders the file unreadable. A film like *Decasia* would have been unthinkable during the golden age of photochemical film, insofar as this kind of reflection acquires meaning in opposition to the emergence of the new technology, which exposes the peculiarities of the old one. It is the rise of digital technology that re-historicizes analog film stock by showing how it can display traces of its own history.

Obsolescence is therefore the product of a discourse surrounding digital technology, rather than a property of analog technology *per se*. By promoting the newness of the digital, its proponents are compelled to proclaim concurrently the obsolescence of the analog; in return, the obsolescence of the analog fosters reactions of re-appropriation and re-configuration of the old

technology on the part of artists, filmmakers, and also cinephiles. This mechanism is not exclusive to cinema (suffice it to think of vinyl records, for instance), nor is it anything new. In addition to being technologies, cinema and photography have always been the product of the social discourse surrounding them. In discussing the truth claim of photographs, Gunning writes:

> [T]he apparatus, in itself, can neither lie, nor tell the truth. Bereft of language, a photograph relies on people to say things about it or for it. […] Both historically and institutionally, in order to tell the truth, the photograph must be subjected to a series of discourses, become, in effect, the supporting evidence for a statement. Anyone who knows either the complex history by which photographs were granted evidentiary status in legal trial, or indeed the scrutiny and discussion to which they must be subjected before they are granted such status in contemporary trials must realize that in order to speak the truth the photograph must be integrated into a statement, subjected to complex rules of discourse – legal, rhetorical and even scientific […].[36]

In his essay, Gunning shows that photography is not defined exclusively by its technological characteristics, insofar as they are meaningless unless validated by a series of social discourses. These discourses are constantly shifting in history, so creating fluctuating understandings of what photography and cinema are, depending on the kind of context in which they operate. The long discussion of indexicality, based on the understanding of analog technology as a stable and coherent concept against which to construct discourses on digital images, is a perfect example of how a technology cannot be understood in isolation from the discourses in which it is immersed. The rise of the digital constructed a certain vision of the analog, and in return this very vision gave meaning to the newness embodied by the digital – for better or for worse. This mechanism applies not only to the truth claim of photography (and film), but also to our perception of other aspects of the technology, including its obsolescence. It

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36 Gunning, "What's the Point of an Index," 42.

is the discourse surrounding digital that makes the analog obsolete, rather than an imaginary, absolute obsolescence of the older technology itself.

Despite the mortuary connotations that the term often suggests, obsolescence does not decree the end of a technology, but rather opens up new ways to look at it, understand it, and use it. As Babette B. Tischleder and Sarah Wasserman write,

> it is precisely because the obsolete is not longer "useful" in certain ways that it can become "useful" in others. […] The careful eye can locate the beauty inherent in what has been cast off. This is symptomatic of the way that obsolescence often frees a thing for artistic use: it is precisely because an object has lost its former use or exchange value that it lends itself to other, creative practices.[37]

In the case of film, I think it is necessary to distinguish the aesthetic appreciation of the obsolete object ("the beauty inherent in what has been cast off") from the new types of potential use opened up by the obsolescence of a technology. Artistic use is definitely one of them, as demonstrated by the work of filmmakers such as Tacita Dean and Bill Morrison. However, there is more to the potential of analog film in the digital age. In order to see it more clearly, it is necessary to shift our attention from the technology at large to the objects in which it is embodied – that is, the film themselves.

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37 Babette B. Tischleder and Sarah Wasserman, "Thinking out of Sync: A Theory of Obsolescence," in Babette B. Tischleder and Sarah Wasserman (eds), *Cultures of Obsolescence. History, Materiality, and the Digital Age* (New York: Palgrave Macmillan, 2015), 3.

The Future of Analog Film

If digital technology rendered film obsolete, what to do with all the film objects stored in archives worldwide? In an essay from 2014, film archivist and scholar Sabine Lenk tackles this problem, which represents the hidden side of the digital revolution.[38] Even though the digital issue has been widely discussed by archivists and scholars for a couple of decades, Lenk's approach is somehow unusual and differentiates itself from the common discourse surrounding the new technology. However different the scholarly and the archival discourses may be, they both largely focus on the same aspect of the issue: digital technology applied to moving (or still) images. This observation might sound obvious, even tautological: what else should studies on digital technology focus on, if not digital technology? And yet, the title of Lenk's article points in a different direction: she asks, "what is the future of *analog* prints in a digital world?"

Lenk is not the only scholar/archivist whose preoccupation lies more with the objects that the digital revolution leaves behind than with the present and future of digital cinema. For instance, Paolo Cherchi Usai has long been advocating for archival policies that protect analog film from oblivion and its consequences, such as abandonment and eventually destruction.[39] From an archival perspective, Lenk's question is a crucial one: film archives are filled with prints that supposedly are rendered obsolete by the advent of digital cinema. What can archives do with

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38 Sabine Lenk, "Archives and Their Film Collection in a Digital World; or, What Futures for the Analog Print?," in *The Moving Image* 14.2 (Fall 2014): 100-110.

39 See, for instance, Paolo Cherchi Usai, "Film as an Art Object," in Dan Nissen, Lisbeth Richter Larsen, Thomas C. Christensen, and Jesper Stub Johnsen (eds), *Preserve Then Show* (Danish Film Institute, 2002), 22-38; Paolo Cherchi Usai, "Are All Analog Films 'Orphans'? A Pre-Digital Appraisal," in *The Moving Image* 9.1 (Spring 2009): 1-18.

them? Lenk sees two possible outcomes for the current situation. She writes: "Can the analog prints in a DCP ruled world still be useful for public screenings in the archive's movie hall, or will 'handbags made from recycled 35mm Hollywood movies' be their destiny?"[40] The way in which Lenk phrases this question implies that a *tertium non datur*, that is, that there is no third way between fighting for the continuation of analog screenings, at least in an archival setting, and dumping film prints in a metaphorical "obsolescence" garbage bin, however recycling-friendly that might be. However, I believe that this binary opposition is flawed, and that an alternative between these two practices does exist. The third way is to be found by taking two aspects into consideration. On one level, it is necessary to consider the shifting discourses surrounding film and digital, among which "obsolescence" is probably the most pervasive; at the same time, it is key to assess the consequences of the practice of digital preservation of analog moving images, and the way in which it reshapes not only our relationship with film objects, but also our understanding of analog technology in general. Digital preservation turns analog films from objects of use into archival objects, and this conceptual shift, together with the broader shift operated by the obsolescence of the analog, opens up new avenues for the use of film materials as primary sources for historiography, while challenging the concept of obsolescence itself.

As a matter of fact, digitally preserved films (concurrently with the switch from analog to digital technology in most exhibition venues) virtually take out of circulation analog copies of the same title. This is the issue that Sabine Lenk addresses in the article I cited: what are archives supposed to do with these "obsolete" copies? As I mentioned, she sees two opposite ways out of this problem: analog prints can be either dumped, or projected in an archival setting. Obviously,

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40 Lenk, "Archives and Their Film Collection in a Digital World," 101.

she opts for the second route, and elaborates on the advantages of keeping analog projection alive – at least under particular circumstances. Although I certainly agree with Lenk on the importance of screening analog film, especially for a film archive, I believe that a more thorough conceptualization of the issue is necessary, and that exploring the influence of digital preservation on analog archival holdings can unveil the third way out of the dilemma. The key point is the difference between film preservation and the restoration of other fine arts: in film, the outcome of any restoration work is necessarily a new object. In the case of analog, or photochemical, preservation, the new object would be a film print; in the case of digital preservation, a file. This is a consequence of the nature of film as a mechanically reproducible object, but it also shows the limits of mechanical reproducibility: the result of the preservation work is never identical to its print source, and it is not supposed to be. Each film object is different from any other, and as such it is in itself an original.

The use of digital technology brings this concept to an extreme: the digitization of an analog print would not only show differences from its source as regards print-specific elements (such as chemical composition of the film stock, type of emulsion, edge codes, but also splices or notes written on the leader); it would belong to a completely different technological realm. It would be ontologically different, as most theorists of digital cinema would put it. It is by virtue of its ontological difference that digital technology applied to preservation reconfigures analog film, and allows us to perceive it, and use it, differently. In other words, the different light that the digital sheds on the analog unveils modes of use of the latter that were previously hard to see.

Among the many distinctions that it is possible to draw between analog and digital technology, one is particularly significant: a digital file does not provide us with the same type of

evidence that a film does, insofar as, unlike film, a file can theoretically be transferred indefinitely in a lossless way. Talking about "originality" in the case of a digital file is problematic to say the least. Cataloging rules can be helpful for understanding this aspect as well. With respect to digital items, the *FIAF Moving Image Cataloging Manual* proposes this definition: "In the case of purely digital media, an item is defined as the availability of the computer file, *irrespective of the number of backup copies that may exist* [my italics]."[41] This definition does not imply that a digital file cannot be identified by its technological specificities; in fact, the item description of a digital file includes the characteristics that identify it and distinguish it from other files of the same content. However, these instructions do imply that it is possible to have back-up copies of a file that are completely identical to each other and to the originating file. As we have seen, this is not possible in the case of analog film, insofar as each copy would be unique and different from any other copies of the same content, even if only in small details. Moreover, the identifying features of a file are properties of the file itself, irrespective of its carrier. A file can be stored on a hard disk, on an LTO tape, on the cloud server, and it would always be the same file. This is not true in the case of film. In analog media, there is no separation between content and carrier. Transferring the content of a film onto a different carrier necessarily means creating a new copy, different from the originating one, and the end result would be the existence of two objects of roughly the same content, but with different technological characteristics.

What are the consequences of these distinctions on an analog print when is is digitized, then? As I have argued earlier as regards analog film in general, the status of the print that

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41 Fairbairn, Pimpinelli, Ross, *FIAF Moving Image Cataloguing Manual*, 3.

undergoes digital preservation change from object of use to archival object, and as such it becomes historical evidence insofar as, unlike a digital file, a print is able to bear traces of its own history in its material existence. Even if an analog print is not used for projection, it remains the physical manifestation of that particular film at a certain stage in history. In this mechanism it is possible to see how the macro-level of the obsolescence of a technology and the micro-level of the obsolescence of an object are two different things, and yet can merge in the different understanding of the old technology that the new technology invites. An analog film that has not been digitized is not an obsolete object, strictly speaking: it remains the only means that allows that film to be seen. As such, it would fall into the category of "objects of use." Nonetheless, the discourse surrounding analog technology and the fate of digitized analog prints concur to assigning the status of archival objects even to those prints that are still used for projection.

An archival object is not a dead or useless object. Rather, it is a historicized artifact that can be understood as evidence of a past embodied in its own material existence. In this case, "archival" does not simply mean "belonging to an archive," or "stored in a temperature- and humidity-controlled vault." It also means that film belongs to a category of objects that need not only restoration and preservation, but also passive conservation, regardless of their projectability.[42] Archives know this very well, and archival ethics demand to safeguard the integrity of whatever film undergoes a restoration project, so that the film source can safely go back to its vaults once the task is complete. Any film becomes history once it enters the archive. The key is understanding that the history of a film stands not only in its content, or in its

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42 The expression "passive conservation" indicates the procedures put in place to guarantee the longest possible survival of a film copy in a storage vault.

relevance as a text, but also in its material characteristics. The histories embodied in the double nature of film are certainly related, but can also branch out to social, economic, and political issues in completely different directions. This is why, in the definition "archival objects," both terms are equally important: if it is the archive that conserves the historicity of film, it is film's existence as a physical object that allows history to be read in the materiality of film.

In this sense, films are clues that point to broader historical phenomena to which they are intimately connected. At the same time, films provide the researcher with clues that only a trained eye can see. It is from this perspective that films can be understood in the light of that evidential paradigm that Carlo Ginzburg sees emerging in the humanities in the nineteenth century.[43] Edge codes, for instance, are meaningless if the person who examines them does not know what they mean. They become meaningful only in the context of an encounter between an object and an observer with a particular archival expertise. This is another reason why it is helpful to define film as an archival object: only someone who has been trained as an archivist can read it as such. These elements contribute to strengthen the relevance of a reading of cinema as the totality of individual physical objects that comprise it, rather than as an abstract medium that can be understood in purely theoretical terms. Individual objects are carriers of evidence that refer both to cinema itself and to broader historical phenomena, functioning as a *trait d'union* between the medium and its context. Only by looking at films as individual artifacts it is possible to read them as clues, which in turn makes them generative evidence of the relationship between cinema and history. In this sense, analog film differentiates itself from a digital file insofar as it not only provides the researcher with historical clues that are embedded in the very materials of

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43 Ginzburg, "Clues."

film, but also allows the researcher to read these clues directly, without the mediation of a machine. Inspecting a film on a rewind bench gives access to a different kind of knowledge than projection does, and reveals those archival clues that would be otherwise invisible.

These archival clues have of course always been on film, even before the introduction of digital technology rendered it "obsolete." However, as long as film was the principal means for producing and experiencing moving images, its materiality was taken for granted. This made it difficult to understand the potential of taking the material side of film into consideration. An example is provided by the 1976 book *The Historian and Film*, which claims to be one of the earliest attempts at establishing film as a historiographical source.[44] Most of the book is devoted to assessing criteria for using film as historical evidence; however, unsurprisingly, "film" is almost always meant as text, rather than object. In other words, the authors examine how the content of photographs and films can be helpful for the historian, and what the potential risks of using them as historiographical sources may be. Issues of genre, documentary, fiction, historical context, point of view are discussed at length. One chapter is devoted to film archives, and offers advice on how to access films in an archival setting. The authors of *The Historian and Film* are clearly familiar with the materiality of film and with archival practices; yet, they almost always overlook the examination of film as a physical object in favor of the reading of film as an audiovisual text. There is only a small exception to the exclusive attention to the textual nature of film, and the way in which it is articulated is significant. In the chapter titled "The Evaluation of Film as Evidence," William Hughes writes:

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44 Paul Smith (eds), *The Historian and Film* (Cambridge: Cambridge University Press, 1976).

> A film also reflects the state of film technology at the time of production, so that such factors as the size and shape of the picture may enable us to determine that our film was made before or after the introduction of "cinemascope" (c. 1953). […] The researcher may extract other useful information from the film stock itself. Film manufacturers often mark and number their products directly on the stock. These punch-marks and latent images may enable the historian to determine whether his print is an original or a duplicate of much later vintage. If he is working with an original print, these markings may lead him to the source or approximate date of his footage.[45]

This quote shows how the materiality of film was definitely not unknown before the advent of digital, and that researchers were aware of the clues embedded in film materials. However, there are two elements that is worth noticing. For one thing, the author mentions the possibility of collecting clues by examining a film print, but never applies this method throughout the chapter, which is very much centered around the idea of "film as text." It is fascinating to notice that, throughout the chapter, there is a sort of terminological confusion about the use of the word "artifact," which always refers to the content of the film, rather than to its physical nature. This slippage shows how, before the advent of digital with all its consequences on the level of materiality, it was pointless to distinguish between the material and the textual aspect of film. The two things were seen as so intimately related to the point that they became the same thing. In addition to this, Hughes considers these clues significant insofar as they can be helpful for collecting information related to the film itself. For instance, if the frame has a particular shape and size, the film can be dated according to the technology used for shooting it. Manufacturing marks can have a similar function. The author does not consider how these elements can be helpful in reconstructing the history of the print itself, or in putting the

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45 William Hughes, "The Evaluation of Film as Evidence," in Paul Smith (eds), *The Historian and Film* (Cambridge: Cambridge University Press, 1976), 50.

film in relationship with broader historical phenomena, such as industrial developments. For Hughes, these clues are useful only insofar as they serve our understanding of the film as a text. There is no interest in the materiality itself – unsurprisingly, as its epistemological potential was hard to see during the analog age. The familiarity of the author with the physical characteristics of film, though not completely accurate, is symptomatic of the familiarity of film scholars with the materiality of the medium in an age in which it was unavoidable to handle film in order to have access to its content in an archival setting; at the same time, this very practical need to deal with a physical object in order to access the film text obscures the peculiarities of the object itself, which is perceived only as a carrier of moving images, rather than an object of investigation in itself.

Another example of this dynamic is represented by Harold Brown's *Physical Characteristics of Early Films as Aids to Identification*, a systematic attempt to catalog and make accessible some of the clues that the film object can offer.[46] Significantly, this incredibly valuable effort came from an archivist who worked at the National Film Archive in Britain from 1935 until his retirement in 1984. As the preface to the book (written by Brown himself) explains, "In the course of his handling of many films of the period prior to the first world war, [Brown] found that he was able to recognize the product of certain film makers of that time by the appearance of the films themselves, as distinct from the subject matter as seen on the screen."[47] This introduction reveals two key details. On the one hand, it was the constant handling of film as an archivist that allowed Brown to develop a method for identifying clues on

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46 Harold Brown, *Physical Characteristics of Early Films as Aids to Identification* (Bruxelles: FIAF, 1990).
47 Ibid, 2.

the film stock itself. The archivist's perspective is different from the historian's or the film scholar's, insofar as for an archivist the film object is as important as the audiovisual text that it contains, if not more. This is why, by handling film, Brown attained a different kind of knowledge from the one attained by other researchers, such as historians, who focus on the content of the film despite being familiar with its materiality. In other words, by handling film in an archival environment Brown refined an archival connoisseurship that allowed him to read clues that would have been meaningless to most people.

On the other hand, Brown employs this method as an aid to the *identification* of early films. Not dissimilarly from Hughes, though with a more sophisticated archival awareness, for Brown the materiality of film is a means to an end, rather than an object of inquiry in itself. This is by no means a limit, and Brown's work is as helpful as it is inspiring. However, I believe there is more to discover by going one step further and placing the film object itself as evidence of something that goes beyond its content, or its relationship with that abstract "film as work" which indistinctly comprises all the copies of a certain title. By investigating individual film objects as archival objects, rather than representatives of a certain film work, it is possible to achieve a different kind of knowledge through an epistemic shift that, though previously possible, was difficult to imagine before the advent of digital technology changed the status of analog technology.

Examples of films as archival objects are plentiful. Prints of the 1987 and 2001 preservations of *Metropolis* would be obvious ones. Even though more recent efforts rendered these preservations superseded, their copies embody the history of the preservation of *Metropolis* in their own physical existence. The 16mm Argentinian copy would be evidence of something

else, even though it refers to the same "film as work" as the 2001 and the 2010 preservations. Among other things, the Argentinian 16mm copy silently testifies of the circulation of *Metropolis* at different stages in history, and it stands as evidence of a story involving collectors, distribution companies, and public archives. I am sure there is much more to be discovered about these copies, but only a physical inspection of the material objects can reveal clues that would be invisible in a digital copy of the same content.

Other examples can be provided by films that were distributed in different versions due to censorship or commercial strategies. Even though most of these versions may be unfit for screenings, because shorter or edited differently from the "original" version, they constitute evidence of the history of that particular film, an individual history that branches out to broader issues in national, cultural, political, and social history. This understanding of analog film would allow us to include in the category of "historical evidence" also those materials that were not supposed to be screened in the first place: censorship cuts, or pre-print materials such as negatives or workprints, for instance. Even though these objects may not be used for projection or preservation purposes, as archival objects they become meaningful and generative evidence.

Another example of one of the several ways in which this mechanism can work is provided by the preservation of *Miracle in Milan* that I discussed in Chapter 1. The older, "original" version of *Miracle in Milan* does not circulate anymore. The 2001 preservation superseded it. However, the analog copy that served as source material for the preservation work remains the only material where the wires holding the broomsticks are still visible. As such, it represents historical evidence of how *Miracle in Milan* was produced, with all the consequences that this has on film production history and film analysis.

I believe that the evidentiary value of film shows how "obsolescence" as an industry-driven concept is too broad of a term to encompass all the different uses that analog film invites, all the different media that are labeled simply as "analog" despite their differences, and all the different objects that belong to a specific medium and that, in their individuality, constitute evidence not only of their own history, but also of the broader historical phenomena of which individual histories are an integral part. Obsolescence is helpful insofar as it allows us to see things differently, both on the broader level of analog technology and on the smaller level of individual films. If discourses surrounding digital technology are what rendered film obsolete, it is the digital preservation of specific films that renders the analog copies of the same title obsolete – as in the case of *Metropolis* and *Miracle in Milan*, for instance. However, if the obsolescence of analog technology is necessary to redefine the status of film objects, the concept becomes inadequate once their status has shifted from objects of use to archival objects. Can evidence become obsolete? From an industrial standpoint, certainly; from an archival and historiographical one, definitely not. It is at the archival level that an all-encompassing ideology of obsolescence must be challenged, not through a rearguard action that dismisses digital as the death of cinema, but through a conservation and access policy that valorizes films as irreplaceable historiographical sources available to film scholars and historians in general.

Such a policy, though certainly complicated to put in place because of staffing and funding issues, is necessary to keep archives and archival holdings alive. As Cherchi Usai warns in his article "Are All (Analog) Films 'Orphans'?," "Because of their subsidiary relation to the digital domain as the primary arena for public access, [the] community of orphans could then be expanded to all photochemical film prints. In a nutshell, all analog cinema is potentially an

orphan."[48] Cherchi Usai's point is valuable: once analog prints are not useful for projection, or do not guarantee a financial return, their survival is threatened. In order to face this situation, Cherchi Usai proposes "to seek new terms of engagement with archiving moving images in a public institution."[49] The acknowledgment that analog films are archival objects, and as such irreplaceable historical evidence, can be one of these "new terms of engagement" on the part of film archives. On a practical level, such engagement is certainly complicated to carry out; however, the awareness of its necessity is a first step in the direction of different relationship with our cinematic past in an archival setting.

The advent of digital technology, with its radical difference from analog technology, allows us to see the latter in a new way and to find new uses for analog film that do not go against the need to keep it alive in the projection booth, but integrate exhibition with other forms of access and research. The digital preservation of analog film reconfigures not only what cinema is now, but also our perception of what cinema has been, and the status of analog materials themselves. Including digital preservation in the broader discourse surrounding digital cinema is a necessary step towards a more comprehensive understanding of what cinema is, what cinema has been, and what cinema can be.

The focus on objects can offer a different perspective on cinema than the one that usually emerges from discussions surrounding analog and digital technology. In the next chapter, I will

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48 Cherchi Usai, "Are All (Analog) Films 'Orphans'?," 15. The term "orphan film" refers to those titles whose copyright holders are unknown or uninterested in the fate of the films they own, thus putting those films at high risk of neglect and eventually disappearance. On a similar topic, see also Paolo Cherchi Usai, "The Digital Future of Pre-Digital Film Collections," in *Journal of Film Preservation* 88 (2013): 9-16.

49 Ibid, 16.

provide a detailed example of how the examination of films as archival objects can integrate the examination of more canonical archival sources in order to achieve a more complete understanding of historical phenomena. I will reconstruct the early years of an Italian Catholic film company, San Paolo film, by using both unpublished documents and film negatives as primary sources. This example clarifies how the materiality of film is central to its status as archival object, as the key clue is the chemical composition of the film stock itself.

Chapter 3

The Evidence of Film

Small Gauge Nitrate Film Stock in Post-War Italy

"It's a curious thing," remarked Holmes, "that a typewriter has really quite as much individuality as a man's handwriting. Unless they are quite new, no two of them are exactly alike."
Arthur Conan Doyle, "A Case of Identity"

Sherlock Holmes was transformed when he was hot upon such a scent as this. […] His nostrils seemed to dilate with a purely animal lust for the chase, and his mind was so absolutely concentrated upon the matter before him that a question or remark fell unheeded upon his ears, or, at the most, only provoked a quick, impatient snarl in reply.
Arthur Conan Doyle, "The Boscombe Valley Mystery"

In May 2010, a very peculiar film reel was retrieved in the conservation vaults of the Museo Nazionale del Cinema in Torino, Italy. It was a negative copy of the Italian version of the Swedish comedy *Pengar – en tragikomisk saga* (title on the copy: *La coda del diavolo*, Niels Pope 1946).[1] The peculiarity of this film does not stand in its content as much as in the film stock itself: this copy of *Pengar* was printed onto 16mm nitrate film. This detail might sound insignificant to those who are not familiar with archival issues. However, the discovery was surprising to say the least: in fact, according to the technical literature, nitrate 16mm film does

1 The circumstances of this discovery and its consequences for archival practices are detailed in Luca Giuliani and Sabrina Negri, "Do You Have Any 16mm Nitrate Films in Your Archive? The Case of Ferrania 16mm Nitrates in the San Paolo Film Collection at the Museo Nazionale del Cinema in Torino," in *FIAF Journal of Film Preservation* 84.4 (2011): 33-37.

not exist. Born as an amateur format, 16mm has always been manufactured on safety stock (acetate or polyester) to avoid the risks posed by the handling of the highly flammable nitrate film in a non-professional context.

Although the majority of texts, including those habitually used as references for the archival field, acknowledges the theoretical possibility of the existence of 16mm nitrate film stock, none of them reports any known existing copies. In December 2008, AMIA (Association of Moving Image Archivists) published an official document containing their guidelines on how to identify and handle nitrate film. In addition to a list of the necessary precautions to adopt, AMIA offers some instructions on how to recognize this type of film stock. As regards small gauge film, their instructions are rather simple:

> If your film is 16mm wide (which can have perforations on both sides or just one), it is almost certainly not nitrate. Small quantities of 16mm nitrate are believed to have been made in the Soviet Union and China in the '50s and '60s, but none is known to have been exported to the west.[2]

Until 2010, no nitrate 16mm copies were known to exist outside of the former Soviet Union and China, and even in these cases their existence was based on conjectures rather than certainties. Nonetheless, after the discovery of the nitrate 16mm negative of *Pengar*, about thirty more copies with the same characteristics have been retrieved in the vaults of the Museo in Torino. They are all part of the same collection, belonging to the Catholic production and distribution company San Paolo Film, and most of them are branded *Ferrania*, the only Italian

2 "Identifying and Handling Nitrate Film," last modified December 2008, accessed May 3, 2017, http://www.amianet.org/sites/all/files/NitrateIGNov08.pdf.

film stock manufacturer.[3] In a few of them, the edge code is not readable as it has faded over the years. The titles of these copies are fairly heterogeneous, but not at all different from the typical titles in the San Paolo collection – comedies, animation shorts, children's movies. These films are special because of their physical characteristics, rather than their content.

Because of this, the nitrate 16mm films discovered in Torino embody the clearest example of the evidentiary value of the materiality of film as archival object. What kind of knowledge is it possible to acquire if the terms of engagement with a film are shifted – that is, if the content of the film becomes a clue about the history of the object itself, and not vice-versa, as it usually happens? And, in turn, what does the history of the object reveal about broader histories – national, industrial, cultural? To answer these questions, it is key to investigate the circumstances of the discovery of the nitrate 16mm films, and to place these objects in the historical context of their manufacture. In order to do so, it is necessary to engage with the history of San Paolo Film, the company that owns the collection, and Ferrania, the manufacturer of these peculiar objects. The clues collected through the investigation of each of these different elements will shed light on the others, in a web of relations at the core of which stand the film objects themselves.

The case of the nitrate 16mm films, and the circumstances of their discovery, has an importance that goes beyond the context of their manufacture to become exemplary of an archival methodology that bridges issues of materiality, ontology, and historiography. What

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3 It is important to specify that the San Paolo Film collection was deposited with the Museo Nazionale del Cinema in Torino, but remained property of San Paolo Film. In 2016 the entire collection was acquired by the Cineteca Vaticana and moved from Torino. Where exactly these materials are stored now is unclear. However, the nitrate copies that were present in the collection, including the 16mm nitrate films, are now deposited with the Cineteca di Bologna.

follows is therefore not only the story of the different parties involved in the manufacture and dissemination of nitrate 16mm film, and of the conditions that brought them together, but also, and more importantly, an example of how film can become evidence. The history of San Paolo Film and Ferrania, and of how they intersect with Italian history in the period preceding and following the Second World War, is definitely fascinating, and opens up new questions and ways to think about the relationship between national history, cultural history, and political history in Italy and abroad. However, my goal here is not necessarily that of following all the threads that may depart from the objects I examine and research. Rather, I want to show how film as a material object is a complicated entity that stands at the confluence of technology, ideology, politics, and economics. This is of course nothing new. Nonetheless, as I argued in my previous chapters, I would maintain that little attention has been paid to the evidentiary value of the archival life of film, and how inseparable it is from film's materiality. A digital file would not embody the same evidence of a film of the same title, nor would two different prints of the same film – although the ontological difference between a digital file and a film object should not be underestimated, as it is reflected in the different kind of evidence that they provide, and in the different kind of expertise necessary to identify the clues embedded in them. This material complexity and the public spheres it engages (political, economical, religious, cultural, industrial) are other pieces in the puzzle that the question "What is cinema?" evokes. If cinema is part of all of these contexts, and influences them in return, is also because of its material nature. It is therefore in the materials that clues pointing to broader historical phenomena can be found. Certain aspects of cinema history can only be known through the examination of the material

objects that history left us, as different individual objects would point to different historical phenomena that cannot be reconstructed from the film texts alone.

What I want to emphasize with the reconstruction of the events that led to the manufacture of nitrate 16mm film stock is not only the history of the parties involved, but also the methodology that allows to use film materials as primary sources for historiography in a way that goes beyond an exclusive attention to issues of aesthetics or narrative. In other words, I want to demonstrate that the kind of knowledge accessible from the examination of the materiality of film as an archival object is qualitatively different from that acquired through the examination of the content of a film as a text to be interpreted. From this perspective, this chapter has a two-fold purpose: while the history unveiled can be of interest to scholars of Catholic cinema or Italian industrial history, the implications of the methodology used are much broader, and provide new ways for thinking about film historiography in general. My hope is that the history reconstructed in these pages might be of help not only to scholars working on small gauge distribution in Italy after the war, or on the relationship between cinema and Catholicism, but also to historians in general, who may be interested in the method used rather than in the particular history that I reconstruct. If I dwell on historical minutiae, it is not necessarily because they are meaningful *per se* (although they could certainly be, depending on the purpose and the scope of one's investigation), but rather because it is in these minutiae that the relationship between cinema, material objects, and history is reflected on a small scale, and it is from them that the bigger picture can be drawn.

Therefore, this chapter will be devoted not only to a reconstruction of the history of Ferrania 16mm nitrate film stock through the examination of the copies themselves and of more

canonical archival sources, but also to showing how the inclusion of film objects in the realm of primary documents for historiography can be an invaluable source of information that would be otherwise inaccessible. In addition to this, in the last part of this chapter I will show how such a historiographical operation can be a helpful contribution to the ongoing discussion of digital technology, especially as concerns what sets it apart from analog technologies. The key is the evidentiary value of the materiality of film, which is what distinguishes it not only from digital files, but also from different types of analog media, so providing a further challenge to that analog-digital binary that I have questioned throughout this project.

The San Paolo Film Collection

Despite its enormous influence on Italian film culture, not much has been written about San Paolo Film. Whatever the reasons for this absence may be, the lack of literature about the company makes the San Paolo Film collection all the more precious, insofar as the collection in general, and the individual films that are part of it, constitute evidence of the company's activity and of its pervasiveness in Italian culture, especially during the post-war period. The sheer size of the collection is revelatory. When the Museo Nazionale del Cinema acquired it in 2003, the inventory that accompanied the shipment listed 4,144 titles, for a grand total of 17,000 film cans. This estimate turned out to be conservative once the inspection campaign began in 2008. It was soon clear that every can often contained more than one reel, and it was not unusual for the reels stored in the same can to be unrelated to each other. When I found the first nitrate 16mm film, two years into the inspection campaign and with approximately half of the collection still to be

examined, about 6,600 copies had been inspected, for a grand total of 13,618 reels.[4] Furthermore, not all the materials produced by San Paolo Film are part of the collection in question: a considerable number of the films is conserved at the Istituto Luce in Rome, and an undisclosed number of copies is still in possession of San Paolo Film itself.

A collection this size, with materials ranging from 1938 to the late 1970s, is not only evidence of the history of the company to which it belongs; it is also evidence of cinema's technological history. The elements that make up the San Paolo Collection are extremely varied. There are prints, negatives, workprints and intermediates; picture only and soundtrack-only (optical and magnetic) elements; 35mm, 17.5mm, 16mm and 8mm films; black-and-white and color films shot with a broad range of emulsions and systems; on nitrate, acetate, and polyester film stock. Some of these technologies are common and widely known, others are odd and rare, others are unheard of. The San Paolo Film collection offers a rare diachronic slice of technological history, and as such is a treasure trove for researchers. The materials in the collection show in the clearest possible way how history in general, and technological history in particular, does not proceed in a linear and teleological way, but rather is riddled with exceptions, detours, steps back and quickly abandoned experiments. Nitrate 16mm film is an example of one of these deviations from a supposedly straight path of evolution, and as such is a privileged area of investigation.

The fact that a small number of nitrate 16mm films could be located in such an ocean of reels is also significant and deserving to be elaborated upon. How could the negative of *Pengar*

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4 These data are taken from the inspection spreadsheet conserved at the Museo Nazionale del Cinema in Torino, where I worked on the inspection and cataloging of the San Paolo Film Collection from 2009 until 2012.

be recognized as peculiar among thousands of film reels that looked exactly the same? The answer is simple: it smelled differently. Nitrate film has a characteristic smell that some describe as similar to that of camphor, though more pungent. The key clue for identifying the reels as objects out of the ordinary was therefore embedded in the very materiality of film. The revealing detail in *Pengar* was not in the content of the negative, but in its physical characteristics as a film archival object. This shows not only the centrality of the material nature of film, but also how it fits into the evidential paradigm that Carlo Ginzburg laid out in his essay "Clues." An archival connoisseurship is necessary to recognize a smell as significant and meaningful, rather than just a contingent detail with no epistemic consequences. The encounter between a perceiving subject and an object of inquiry is the necessary condition for the clue to be found, and it is the expertise of the subject that allows him or her to perceive differently, and to tell clues apart from contingent elements. Intellectual reasoning and argumentation come at a later stage. The first step is perceptual, and is possible only if the perceiving subject has a previous knowledge that allows him or her to make sense of the sensory chaos of the world, and to isolate the meaningful details out of the continuum of reality. Like Sherlock Holmes who concentrates upon the matter before him to extract clues that nobody else is able to see (or hear, or smell), the archivist's activity is first and foremost perceptual, and his or her perception is shaped by an archival expertise that most people do not have – thus preventing them from being able to tell the key clue apart from the contingent element.

In the case of nitrate 16mm film, the centrality of this selective perceptual acuity is even more apparent. While the technical literature denies the existence of this type of film stock, my senses pointed in a different direction. It is not surprising that those reels went unnoticed for

decades: when an archivist sees a 16mm film, it is taken for granted that it cannot be nitrate. In this case, perception challenged previous knowledge, and my intuition was correct. Laboratory tests confirmed that the odd-smelling reels were in fact nitrate.

Such a unique discovery is worth of further investigation. If the smell of the film was the clue that revealed its singularity, both in the figurative and the literal sense, could the film itself be a clue pointing to broader historical phenomena involving the film, the company that owns it, and its manufacturer? And how do these phenomena fit into larger issues in national, cultural, and political history? In order to answer these questions, it is necessary to dig into the history of the parties involved in the production and circulation of these film artifacts: the film manufacturer Ferrania, and the production and distribution company San Paolo Film. I will begin with the latter.

Catholic Media Entrepreneurship in Post-War Italy: From R.E.F. to San Paolo Film

San Paolo Film is an Italian Catholic company founded in 1938 with the name of R.E.F. (Romana Editrice Film) by Giacomo Alberione, a Catholic priest who was also the founder of the religious congregation Pia Società di San Paolo (Society of Saint Paul) in 1914. Since the early days of the Society of Saint Paul, Alberione's goal was that of broadening the scope of the Catholic apostolic mission through a savvy use of different kinds of media. Until the 1930s, the Society had limited its action to the publishing business, which turned out to be a very successful endeavor both in terms of profit and outreach. The Catholic world, broadly speaking, saw cinema

as merely an enemy of Catholic morality and traditions.[5] This explains why, even though almost half of Italian movie theaters were managed by exhibitors with ties to the Catholic church, nobody had ever designed a production and distribution strategy catered to them. Alberione foresaw the educational and economic potential of this still unexplored market, and understood that cinema could be turned from an enemy into a powerful ally.

As a matter of fact, Alberione had been aware of the importance of cinema for the dissemination of moral values since the beginning of his apostolic activity; however, he was also keenly aware of the fact that it was necessary to wait until cinema "grew out of its infancy," to use his own terms.[6] This statement might sound naive and uninformed, considered that cinema in the 1930s had been a stable pastime for the majority of Italians for decades, and that Italy was trying to build a film industry that could rival the American one. But Alberione was neither naive nor uninformed, and his claim is more subtle than it might sound. On the one hand, it is not unthinkable that he might have wanted to wait and see what developments the involvement of the Fascist regime in film production may have brought for the industry. This hypothesis is

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5 This is of course a broad generalization that does not take into account the complexity of the Catholic world and of its approaches to cinema. For a more nuanced and detailed approach to the issue, see Guido Convents, "Resisting the Lure of the Modern World. Catholics, International Politics and the Establishment of the International Catholic Office for Cinema (1918-1928)," in Daniel Biltereyst and Daniela Treveri Gennari (eds), *Moralizing Cinema: Film, Catholicism, and Power* (New York: Routledge, 2015), 19-34. On Catholic media in a francophone context, see Pierre Véronneau, "*Le Fascinateur* et la Bonne Presse: des médias catholiques pour publics francophones," in *1895: Revue de l'association française de recherche sur l'histoire du cinéma* 40 (2003): 25-40.

6 Marcello Lauritano, "La San Paolo Film. Genesi e sviluppo del cinema cattolico in Italia" (Dissertation, Università degli Studi di Torino, Academic Year 1978-1979), 9. Most of the information reported so far about the early years of the Pia Società di San Paolo are contained in Lauritano's unpublished dissertation, which constitutes one of the very few scholarly sources about the congregation.

particularly fascinating in light of the first film that the Society produced, a colonial epic titled *Abuna Messias* (Goffredo Alessandrini, 1939), in which the involvement of the regime was not marginal. On the other hand, it was necessary to wait for a softening of the position of the Catholic church as regards the accusations of immorality that had been directed to cinema.

The occasion came in 1936, when Pope Pius XI addressed the issue in the encyclical *Vigilanti Cura*, in which he deemed of supreme necessity that "the motion picture be no longer a school of corruption but that it be transformed into an effectual instrument for the education and the elevation of mankind."[7] His recommendations could not be clearer:

> The problem of the production of moral films would be solved radically if it were possible for us to have production wholly inspired by the principles of Christian morality. […] But since We know how difficult it is to organize such an industry, especially because of considerations of a financial nature, and since on the other hand it is necessary to influence the production of all films so that they may contain nothing harmful from a religious, moral, or social viewpoint, Pastors of souls must exercise their vigilance over films wherever they may be produced and offered to Christian peoples. As to the motion picture industry itself, We exhort the Bishops of all countries […] to address an appeal to those Catholics who hold important positions in this industry. Let them take serious thought of their duties and of the responsibility which they have as children of the Church to use their influence and authority for the promotion of principles of sound morality in the films which they produce or aid in producing.[8]

Alberione took advantage of the Pope's explicit exhortation to produce films informed by Catholic values to embark on the project that he had been cherishing for years: the creation of a Catholic film production company that would complement the already successful publishing activity that the congregation had started in the 1910s. This step was taken in 1938, when

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7 Pius XI, Vigilanti Cura (June 29, 1936), accessible at http://w2.vatican.va/content/pius-xi/en/encyclicals/documents/hf_p-xi_enc_29061936_vigilanti-cura.html (accessed May 7, 2017).

8 Ibid.

Alberione founded R.E.F. (Romana Editrice Film). Despite the obvious inexperience of the newly-born company, the first production project that they undertook was incredibly ambitious. In 1939, R.E.F. hired the famous director Goffredo Alessandrini to make *Abuna Messias*, a film about the life of missionary Guglielmo Massaia, who operated in Ethiopia in the nineteenth century. The choice of both subject and director was not casual. In 1938, with Roberto Rossellini as assistant director, Goffredo Alessandrini had directed the successful colonial drama *Luciano Serra pilota*, which was very well received by both the audiences and the Fascist regime. With the Italian colonial effort at its zenith in the second half of the 1930s, the choice to hire Alessandrini to shoot a film about a missionary in Ethiopia was a clear sign of Alberione's ambition and desire to have in the Fascist regime a powerful ally.

Abuna Messias was shot on location in Ethiopia in 1939, and represented an immense financial effort for the new company – even though a portion of the costs was covered by the regime. The film was fairly successful, and won an award at the Venice Film Festival in 1939. Nonetheless, the revenue was not enough to cover the enormous production costs. The main issue was that R.E.F. did not have a distribution network, and was not well versed in advertising strategies. The outbreak of the Second World War made the situation worse: contracts signed with foreign distributors were not respected, and R.E.F. soon found itself in heavy debt. Even though part of it was paid by the Italian government, and another part was covered by the profits

generated by the society of Saint Paul's publishing branch, the financial situation of R.E.F. remained troublesome.[9]

Because of *Abuna Messias*' commercial failure and due to the harsh conditions in which the company found itself because of the war, R.E.F. decided to suspend its activities in the early 1940s. After the end of the conflict, when the situation allowed for a timid economic upturn, the company decided to resume its film production work, but realized that it was necessary to reframe its commercial strategy. In light of this decision, they decided not to hire costly film professionals as they did with *Abuna Messias*, but rather to take advantage of workers internal to the Society of Saint Paul. The two films that R.E.F. produced immediately after the war, *Il piccolo ribelle* (Eng. Translation *The Little Rebel*, 1946) and *Inquietudine* (Eng. Translation *Anxiety*, 1947), were both directed by father Emilio Cordero, a Pauline priest who would be the key figure in the renaissance of the company.

Cordero was very passionate in advocating for the necessity to use cinema as an apostolic tool, and for this reason was sent to Torino at the end of the war to gain familiarity with the film production business by apprenticing at the FERT studios and La Positiva laboratory. In October 1945, Cordero moved from Torino to Milan to attend a newly-established Catholic film school, set up in the gym of Saint Ambrose church with the equipment that had been moved from Cinecittà to Venice by Fascist officials and eventually brought to Milan at the end of the war.[10] Thanks to the experience gained in Northern Italy, Cordero decided to direct the two films that

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9 This information is taken from Lauritano, "La San Paolo Film," and Emilio Cordero, "La ripresa dell'apostolato cinematografico nel dopoguerra," in *L'apostolato del cinema*, *Quaderni di spiritualità* 7 (Rome: Società San Paolo, 1983).

10 Cordero, "La ripresa dell'apostolato cinematografico nel dopoguerra," 4-5.

R.E.F. produced after the war, the aforementioned *Il piccolo ribelle* and *Inquietudine*, with the collaboration of laic technicians and screenwriters. Even though Cordero was not completely happy with the result, and although the final cost of the productions turned out to be higher than anticipated, the Society of Saint Paul's plan to build a Catholic film industry had resumed.[11]

After the war, Cordero became the main spokesperson for the company, and detailed his curatorial and organizational plans in several interviews. One of the earliest statements is from April 1947, and shows Cordero's strategy very clearly.[12] His project was ambitious, and included a plan to build a studio in the suburbs of Rome. Moreover, Cordero wanted R.E.F. to reach complete autonomy from the laic film industry by giving a solid technical training to the most talented Pauline priests, in order to maintain the structure of the religious congregation in film production as well. This search for autonomy was based on organizational and economic grounds, rather than moral ones. In his interview Cordero praised the film industry workers, who were no longer considered as symbols of immorality, but rather as people "like any other, no better, no worse. Actually, sometimes more good than bad."[13] Whether Cordero's declarations were sincere or not, it is impossible to know. What is certain is that his opening to the film industry was functional to the new idea of cinema that the Catholic world in general, and the Society of Saint Paul in particular, had begun to disseminate.

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11 *Il piccolo ribelle* costed 3,594,000 liras, while Inquietudine costed 10,072,178 liras – approximately $50,000 and $188,888 adjusted for inflation. Both figures do not include the cost of production of release prints. In Cordero, "La ripresa dell'apostolato cinematografico nel dopoguerra," 6-7.

12 In Michele Lalli, "Cinema cattolico italiano. L'attività della R.E.F. casa cinematografica della Pia Società San Paolo," in *La rivista del cinematografo* 4 (April 1947).

13 Ibid.

In the same interview, Cordero also declared the desire to distribute all R.E.F. productions in the 16mm market after six months from their initial release, and to widen the company's catalog to include more commercial titles. In other words, Cordero was planning to acquire from other production companies the rights to reduce their films onto 16mm after their theatrical run. The small gauge version of these films would be destined mainly for the circuit of movie theaters set up in parish churches, which was thriving in Italy at the time. This shows that R.E.F. had learned from the commercial failure of *Abuna Messias*, and understood that the organization of a distribution network was at least as important as the production of a film. Cordero was aware of how grand and difficult the project was, and was eager to specify: "We have no rush, actually we have centuries at our disposal."[14] His prediction turned out to be overly pessimistic: R.E.F.'s 16mm distribution business was launched that same year.

The two R.E.F. productions, *Il piccolo ribelle* and *Inquietudine*, were distributed by the company Zenith Film, thanks to the intercession of a Catholic accountant, Dr. Macchia, whom Cordero had recently met and who would be a key legal and financial advisor for the new path of the Society of Saint Paul. As for *Abuna Messias*, things were more complicated because of censorship issues arisen after the war, and the film could not be rereleased right away.[15] Dr. Macchia drafted a financial assessment of R.E.F. in July 1947, in which he listed the steps taken to start the new course of the company. He wrote:

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14 Ibid.

15 *Abuna Messias*' censorship history is extremely fascinating, and provides yet another example of the centrality of film as archival object for historical research. However, because of its complexity, it would deserve a separate discussion.

> Rental contract with ZENITH FILM for INQUIETUDINE and IL PICCOLO RIBELLE closed.
> Sketches for the two films ordered.
> Trailers prepared.
> Film stock stamps for copies obtained. […]
> *About 16mm*
> Contract with Fumeo for 35 projectors closed, L. [Liras] 3,000,000 paid in advance [my translation].[16]

Even from this dry note, it is possible to understand what R.E.F. had learned from its experience with *Abuna Messias*. Firstly, the reference to sketches and trailers shows a new awareness of the importance to advertise its releases, element that had been previously overlooked. Then, the contract with the company Fumeo for the purchase of projectors was the decisive step to equip the highest possible number of parish churches with small gauge projection rooms, for reasons on which I am going to elaborate shortly. Lastly, the reference to "film stock stamps" seems to suggest a rationing of the material in the years immediately following the war: this hypothesis is strengthened by Dr. Macchia's accounting note attached to the list I am discussing, with reference to the period between November 1946 and July 1947, in which one of the items is constituted by transportation expenses to go to ANICA (the national association of film industries) to pick up the film stock stamps, and another refers to a contribution given to ANICA itself for the purchase of 40,000 meters of film stock. This would

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16 Cfr. "Relazione del dott. Macchia alla R.E.F.," luglio 1947, unpublished handwritten note conserved at Archivio Storico Generale della Società San Paolo (Historical Archive of the Society of Saint Paul's), Rome. Original Italian: Concluso contratto di noleggio con la ZENITH FILM per INQUIETUDINE e IL PICCOLO RIBELLE.
Ordinati i bozzetti dei due films.
Preparate le presentazioni.
Ottenuto i buoni di pellicola per le copie. […]
Per il 16mm.
Stretto contratto con Fumeo per 53 proiettori e anticipati L. 3.000.000.

explain the attempt to purchase film stock from abroad, testified by several documents conserved at the Society of Saint Paul's archive in Rome. For instance, a typed document (not signed, but presumably drafted by Macchia) titled "R.E.F. Situation and Balance Sheet, June 30, 1947" reads: "An operation of import of film stock from America (2,000,000) and Belgium (1,000,000) is underway."

R.E.F.'s debt on June 30, 1947, reported at the bottom of the same document, amounted to 13,034,020 Liras: most of this sum was due to the production of *Il piccolo ribelle* and *Inquietudine*, but some of it was still carried over from the production of *Abuna Messias*. It was therefore necessary to repay the debt by both making a profit and cutting on expenses. This is why Cordero, upon suggestion of Dr. Macchia, decided to stop R.E.F.'s costly production activity and focus on small gauge distribution of films produced by other companies, using as renting agencies the Society of Saint Paul's bookstores already present on the entire Italian territory. To this end, it was necessary to set up an adequate advertising strategy.

In October 1947, a lengthy editorial titled "The Apostolate of 'Cinema' at the Service of Parish Theaters" appeared in the Society of Saint Paul's magazine, *Vita Pastorale*. The anonymous author began with these words:

> The Society of Saint Paul, founded for the apostolate of press, cinema, and radio, now puts itself at the service of Reverend Parish Priests, Institutes, etc, to solve the problem of Catholic cinema. […] It offers to every parish priest and religious institution the equipment of a 16mm movie theater. To this end, it puts itself at Your complete disposal to make it easier in Rome, at the Ministries in charge, to acquire a license for the opening and operation of the theater [my translation].[17]

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17 "L'Apostolato del 'Cinema' a servizio delle Sale Parrocchiali," in *Vita Pastorale*, October 1947. Original Italian: "La Pia Società S. Paolo, sorta per l'apostolato della stampa, cinema e radio, si mette ora a servizio dei Rev.di Parroci, Istituti, ecc. per risolvere il problema del

The help offered by R.E.F. to parish churches was not limited to bureaucratic support for the opening of a movie theater. They also offered a 10% discount on the purchase of a 16mm FACS IV projector manufactured by Fumeo, the company with which they had reached a collaboration agreement. The projector was put on display in several Italian cities, to show its functioning to the priests who expressed an interest in opening a movie theater within their churches. Most importantly, R.E.F. committed to providing each church with one or two films per week. The advantages of internal distribution, as the editorial explains, would be numerous:

1. Guaranteed morality of the shows (the films are carefully selected by a committee of priests, who will make necessary corrections upon viewing).
2. Convenience in receiving the films.
3. We guarantee that you will receive them promptly.
4. That you will have them at a convenient price.
5. That you will also have the best films on the world market at an honest price.[18]

This list provides some significant information. The modifications that the committee of priests reserves the right to make on films upon their viewing, with reference to the morality of the shows, seem to suggest censorship interventions on the film themselves. This is probably the reason why, in the San Paolo Film Collection, cuts and trims are often found together with prints. Censorship was of course not a Catholic exclusive, but this editorial seems to suggest an

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cinema cattolico. […] Essa propone a ogni Parroco e Istituto Religioso l'impianto di una sala a 16mm. A questo scopo si mette a Vostra completa disposizione per facilitare a Roma, presso i competenti Ministeri, i permessi dell'apertura ed esercizio della sala."

18 Ibid. Original Italian: 1. garantita moralità degli spettacoli (le pellicole sono scelte con cura da una commissione di sacerdoti, e la visione vi apporta le eventuali correzioni).
2. comodità di avere le pellicole.
3. certezza di averle puntualmente.
4. di averle a buon prezzo.
5. di avere anche le pellicole migliori che ci siano sul mercato mondiale a un prezzo onesto.

informal further intervention on the part of R.E.F., based on the judgement of the viewing committee. Since no written reports on the censorship strategies of these committees apparently survive, the film materials in the San Paolo Film Collection embody the only evidence available of the rationale of this practice, offering yet another example of the potential of films as archival objects.

Another precious piece of information provided by this editorial is the possibility of having the best films on the world market. This detail is very important because it reveals that R.E.F. was already starting the distribution of film produced by others in October 1947, despite the caution displayed by Cordero in his interview. The first list of films offered by R.E.F., defined "under preparation," included eighteen fiction features and four documentaries. Only three of the features were R.E.F. productions.

Lastly, the emphasis on the convenience offered by R.E.F. suggests the presence in Italy in 1947 of other 16mm distributors, from which R.E.F. wanted to defend itself by creating an internal market impenetrable by other companies, Catholic or not.[19] This scenario is explicitly addressed by the editorial itself a few lines down, when the anonymous writer affirms that, in order to contribute to the success of the project, it was necessary to

19 For a broader analysis of the Catholic influence on Italian cinema, and of the participation of Catholics in Italian film production, see Flavio Vergerio, "Una presenza contraddittoria. L'organizzazione del cinema cattolico in Italia," in *La rivista del cinematografo* 9 (1974), 10-30. An analysis of this topic on an international scale is offered by Guido Convents, "I cattolici e il cinema," in Gian Piero Brunetta (eds), *Storia del cinema mondiale Vol. V: Teorie, strumenti, memorie* (Torino: Einaudi 2001), 485-517.

> commit with the company R.E.F. of the Society of Saint Paul's for a period of at least five years to not screen or let screen films unless provided by the same company [my translation].[20]

R.E.F., as the editorial candidly admits, was aiming at creating a monopoly to avoid competition and acquire films from other production companies at a lower cost. This strategy was aimed at creating a network of Catholic movie theaters controlled by R.E.F. in order to disseminate that "apostolate through cinema" that was at the core of the Society of Saint Paul's mission. For this reason, despite the debt in which R.E.F. was still finding itself, films were rented out at the lowest possible rate that would allow to cover the company's costs, without generating any profit. The achievement of this goal was meticulously planned. In addition to the efforts made to equip the highest possible number of parish churches with 16mm projectors, all the bookstores owned by the Society of Saint Paul were turned into film rental agencies upon father Cordero's suggestion. Moreover, the company started an effective propaganda campaign using all the media controlled by the Society of Saint Paul, *in primis* the magazine *Vita Pastorale*.

R.E.F. was not the only Catholic company to understand the potential of cinema in general, and small gauge cinema in particular. Throughout 1947, several articles advertising the company Cinefilms were published on *La rivista del cinematografo*, the Centro Cattolico Cinematografico's (C.C.C.) official press service. Cinefilms offered its 16mm projectors to parish churches, and would release "the best Italian and international films" in 16mm with the collaboration of the C.C.C. itself. Other smaller Catholic companies were trying to enter the small gauge market in the post war period, but disappeared shortly after their debut. The solidity

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20 "L'Apostolato del 'Cinema' a servizio delle Sale Parrocchiali."

and the organization of the Society of Saint Paul, which had branches all over the globe and a substantial publishing experience, would eventually grant it the monopoly of small gauge distribution, at least in Italy. This was possible also thanks to R.E.F.'s collaboration with its competitors: a typed document conserved at the Society of Saint Paul's archives lists the terms of an agreement between R.E.F. and Cinefilms, which licensed the sale of its projectors to R.E.F. in exchange for a commission, and which in turn would have promoted R.E.F.'s films through its sale agents. Collaboration was deemed more fruitful than competition.[21]

Within two months, more than a hundred parish churches had been equipped with a 16mm projector, and R.E.F. catalog included forty titles. In order to have a broad and varied offer, R.E.F. started making exclusive agreements with Italian production companies for the small gauge distribution of their films. This strategy turned out to be more complicated than expected, to the point that, because of a lawsuit moved to R.E.F. by the representative of the company Jupiter Film, Cordero and Macchia decided to start a new company, Parva Film, in December 1947.[22] R.E.F. was liquidated on November 15, 1947, and definitely closed in 1951.

Despite these obstacles, the activity of the company continued feverishly, thanks especially to the initiative of father Cordero, who kept incessantly making agreements with production companies, laboratories, foreign distributors. It was necessary to be active on different fronts: the choice of films to distribute, the technical work on the films themselves, and the equipment of the parish theaters. At the same time, Cordero was also working on the sale of

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21 Unfortunately this contract is neither signed nor dated, but was presumably drafted in 1947 – judging from the style of the letterhead.

22 The particulars of this lawsuit are detailed in the private correspondence between Cordero, Macchia, and Alberione, conserved at the Society of Saint Paul's archives in Rome.

the R.E.F. productions abroad, especially in Latin America. He decided to create agencies exclusively dedicated to the distribution of small gauge films, and equipped them with specialized staff and means of transportation so that they could reach even the most remote parish churches. In the meantime, the magazine *Vita pastorale* continued its persuasive efforts to convince its readers about the importance of using cinema as an evangelical and educational tool. The editorial "L'apostolato del cinema" appeared almost every month, and from its columns father Cordero and his collaborators repeated almost obsessively the necessity to rely only on Parva Film to get good films, both from an aesthetic and a moral point of view.

This ambitious path was not exempt from pitfalls. *La settimana del clero*, a religious magazine not controlled by the Society of Saint Paul, on February 22, 1948 published a letter from a priest complaining about the issues encountered with the opening of a movie theater in his church, an operation that he considered a complete failure. An internal note was released by the Society of Saint Paul on May 22, 1948 to address the reasons for the limited run of the films distributed by Parva:

> a. Many theaters in parish churches were shut down because their licenses were not in order (they take away their licenses very easily with no apparent reason). […]
> c. Our films have a relative value (some are mediocre) [and] are old. […]
> g. They don't want shorts, they want cartoons and popular things. They demand shorts almost for free – on top of the film (they say they should be added to the film) [my translation].[23]

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23 Original Italian: "a) parecchie Sale Parrocchiali sono state chiuse non essendo in regola con i permessi- (ritirano i permessi con molta facilità senza specificare bene il motivo). […]
c) Le nostre pellicole hanno un valore relativo (alcune scadenti) [e] sono di vecchia produzione. […]
g) I cortometraggi non sono richiesti, desiderano cartoni animati e cose popolari. I cortometraggi li esigono quasi gratis – in più della pellicola – (dicono che andrebbero uniti al film).

This document testifies to the attention given to the priests' requests on the part of the Society of Saint Paul. In fact, each of these points would be discussed on the pages of *Vita pastorale*, which constituted the main instrument of dialogue between the Society and the parishes. Already in April 1948 the Society reassured the priests on how easy it was to open a movie theater in their church, since, according to a memo sent to the Prefects ("circolare ai Prefetti") on March 24, 1942, theaters equipped with 16mm projectors did not need to comply with the safety measures requested for 35mm screenings, as small gauge film is not flammable. Therefore, the closing of theaters for this reason was not justified.[24] The request for shorts and cartoons to be added to the features was soon satisfied: in January 1949, in addition to forty-nine features, *Vita pastorale* advertised "numerous shorts and topolini [literally "mickey-mouses"] to complete the shows."[25] The term "topolini" was used for animated shorts in general, as testified by several copies with the note "topolini" handwritten on the leader conserved in the San Paolo Film collection. As regards the quality of the films, there is a good chance that the complaint was about the quality of the prints as much as the titles. This issue was already on the mind of Cordero's and Alberione's, who agreed on the fact that the equipment of a private laboratory for the development and printing of Parva films was a priority.

The attention to the photographic quality of the films produced and distributed by Parva (and Cordero's interest in film technology) emerges clearly from the papers documenting the

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24 See "Precisazioni per l'Apostolato del Cinema," in *Vita pastorale* (April 1948): 44.
25 "Cinematografo," in *Vita pastorale* (January 1949).

processing of the copies of *Mater Dei* (Emilio Cordero, 1950), the first Italian color film.[26] *Mater Dei*, a film on the life of the Virgin Mary, was shot in 16mm Anscocolor, but released in color only for the small gauge circuit, and almost exclusively in parish churches. The theatrical distribution was licensed to Minerva Film, and the film had a fairly limited release in black-and-white 35mm. The reasons for this choice were technical rather than economical. Don Cordero went to the United States to supervise the laboratory work on the film, and his dissatisfaction with the results emerges clearly from the letters that he sent to Alberione from overseas between September and December 1950. The main issue was the chromatic look of the blown-up 35mm print. Cordero therefore opted for the print of a black-and-white blow-up, rather than jeopardizing the reputation of Parva Film with an amateurish-looking product. This episode shows not only the technical expertise that Cordero had acquired in just a few years, but also the attention that the company paid to the photographic quality of its products, seen as a mark of professionalism and reliability.

The disappointment with the laboratory work performed on *Mater Dei* confirmed the need for a lab managed by the Society itself. Different sources report different opening dates: some claim the lab was open as early as 1949,[27] others say 1952.[28] The confusion probably

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26 It is usually reported that the first Italian color film is *Totò a colori* (Steno, 1952). In fact, *Totò a colori* is the first film shot on Italian color film stock (Ferraniacolor), whereas *Mater Dei* was shot on Anscocolor and developed in the United States, because of the impossibility to process color film stock in Italy at the time. Nonetheless, *Mater Dei* remains the first Italian color feature.

27 Cordero, "La ripresa dell'apostolato cinematografico nel dopoguerra," 13.

28 *50 anni a servizio della Chiesa coi mezzi di comunicazione sociale. La famiglia paolina dal 1914 al 1964* (Rome: Edizioni Paoline, 1964), 97. The same date is reported in the private journal of a Pauline priest, father Umberto Muzzin, at the date August 20, 1952 (journal conserved in the Society of Saint Paul's General Archive in Rome).

derives from the fact that the opening of a laboratory was already in the mission of Parva Film when the company was established, but it is likely that the financial conditions of the Society would not allow the equipment of a lab before 1952, when Parva moved its headquarters from the Society of Saint Paul's buildings to a dedicated space in the outskirts of Rome. Parva hired personnel from the lab Microstampa to train the priests who would eventually be the only employees of the laboratory.[29] This kind of information, besides giving an idea of the scope of the Society of Saint Paul's enterprise, is key for dating some of the materials in the San Paolo collection based on the film can in which they are stored. If the can has the "Parva Film" or "San Paolo Film" logo, it must have been made after 1952; on the other hand, if the can presents the logo of a different lab, it is likely a pre-1952 object. Since in many cases it is hard to establish the date of a particular copy (especially when it is a small gauge reduction of a 35mm film, perhaps distributed several years after the original release of the title), this strategy is incredibly precious for gathering information about the copies in the collection, including those on nitrate 16mm film stock.

1952 was also the year in which the company adopted the name Parva-Sampaolo Film; with this name, it was liquidated on January 11, 1955, and substituted by San Paolo Film on February 5, 1955. These are the years of maximum development for the company, which started acquiring foreign films unreleased in Italy to distribute them in the small gauge market. In 1953, Parva-Sampaolo acquired fifteen titles from the British Rank Films, specialized in kids' movies. This acquisition is particularly noteworthy because the Rank catalog was unreleased in Italy.

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29 "La piccola città della Pia Società San Paolo ha anche uno stabilimento cinematografico," in *Libero orizzonte: mensile di cinema ridotto* 7.11 (November 1952): 23-24.

Thanks to Parva-Sampaolo, the small gauge market was emancipating itself from its ancillary role with regards to the standard theatrical circuit, and started affirming itself as an alternative to it. The rapid expansion of the company is well summarized in an article on small gauge film from 1957: from its inception ten years before San Paolo Film had edited and released an average of five titles per month, and at the same time had continued producing religious educational films. In 1956, 16mm CinemaScope was launched on the market, and at the end of the same year the films acquired by Rank had totaled 32,526 screenings, thanks especially to their projection in elementary schools.[30]

The following table gives an overall view of the activity of the company from its entrance on the small gauge market up to 1955.[31]

Year	Titles reduced to 16mm	Copies for each title	Screenings
1947	12	223	136
1948	32	448	9723
1949	43	485	19034
1950	44	655	21571
1951	29	701	49025
1952	35	1384	51525
1953	61	1528	66805
1954	38	1274	70362
1955	50	1165	71109

Table 1: San Paolo Film's activity from 1947 to 1955.

30 See G.C., "Dal formato normale al ridotto," in *Cinema nuovo* 117 (1957).
31 Table taken from *50 anni a servizio della Chiesa*, 94.

These data are highly significant. For instance, even though the number of titles reduced to 16mm declines in 1951-1952, the number of copies and the number of screenings are constantly increasing. This shows a greater cunning on the part of San Paolo Film in managing its materials – the same title was released in a higher number of copies, and the same copy was screened a higher number of times, with consistent savings on the front of acquisition. But this also shows a constant and solid increase in the number of theaters equipped with 16mm projectors, which went up from 500 in April 1948,[32] to 1,200 in March 1949.[33] On December 31, 1952, the number of theaters opened since the beginning of R.E.F.'s activity was 4,500.[34] Between the end of the 1950s and the beginning of the 1960s, San Paolo Film had reached exclusive agreements with the main Italian and international production and distribution companies, and could be considered the only small gauge distributor in Italy – exception made for a few regional agencies.[35] The monopoly goal was achieved.

Until its demise in the 1980s, due to the decline and eventual disappearance of commercial small gauge cinema, San Paolo Film had been an incredibly influential presence in Italian film culture. The figures I summarized show the pervasiveness of San Paolo Film's distribution network. The size of the enterprise and the ease of equipment and transportation of 16mm films and projectors allowed San Paolo Film to reach even the most remote villages in Italy, thus guaranteeing widespread access to its films and the educational mission that they represented. If the company started out with an explicitly evangelical purpose, its goals

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32 See "Precisazioni per l'Apostolato del Cinema," in *Vita pastorale* (April 1948): 44.
33 See "La vittoria del passo ridotto," in *Vita pastorale* (March 1949): 45.
34 See a report from the Daughters of Saint Paul's (nuns affiliated with the Society of Saint Paul), reported in Lauritano, "La San Paolo Film," 336.
35 Cordero, "La ripresa dell'apostolato cinematografico," 21.

throughout the years became more blurred. While producing religious films, San Paolo Film was distributing the work of controversial directors such as Pier Paolo Pasolini, Luis Buñuel, and Elio Petri, exemplifying the peculiar convergence of interests between fringes of Catholicism and communist ideology that characterized, not without attritions, Italian history for part of the twentieth century.

There are many details of the history of San Paolo Film that are yet to be unveiled, including its conflictual relationship with the Vatican, which was not always in favor of the company's liberal attitude towards the choice of films to acquire and distribute. For instance, in the 1960s San Paolo Film made an agreement with Pier Paolo Pasolini for the production of a film based on the life of Saint Paul, to be written and directed by Pasolini himself.[36] The Vatican opposed the project, causing a small diplomatic crisis with the administrators of San Paolo Film who wanted to pursue it regardless. The project was eventually abandoned – although the company and Pasolini had made plans to discuss it again shortly before the director's sudden death in 1975 – but it exemplifies the friction between the official doctrine and San Paolo Film's independent curatorial decisions.[37]

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36 The script would be posthumously published in Pier Paolo Pasolini, *San Paolo* (Torino: Einaudi, 1977).

37 See Attilio Monge, "Rimpianto per il Paolo di Pasolini," in *Paulus* 1.1 (July 2008): 66-67.

If one were to write a complete history of San Paolo Film, the film objects related to the company would be as important as any written sources, especially as regards the early years of the company. Just to give an example, film prints are an invaluable source of information with regards to San Paolo Film's distribution strategy. Only a few catalogs survive, and it is hard to reconstruct the titles of the films that were acquired and distributed based on paper documents. This issue is even more apparent in the case of shorts, which were never listed with their titles in catalogs or in advertising. The films themselves are the only testimony of their own history and, in turn, of the history of the company to which they belonged. How do nitrate 16mm films fit into this history? What can they tell us about the history of San Paolo Film, and, conversely, how can the history of San Paolo Film make sense of their technological peculiarity?

In order to answer these questions, it is necessary to learn more about the copies themselves.[38] The first clue to consider is that they are all negatives: this means that they were handled exclusively by professionals in a laboratory. This detail is significant, and departs from the widespread identification of 16mm film with the amateur market. If it is certainly true that this format was created for amateur filmmakers and projectionists, and was manufactured in safety film stock exactly for this reason, the emphasis on the amateur aspect obscures the industrial side of the issue, which includes the manufacturing of the film stock and the processing of the copies to be distributed in the home movie market. Nitrate 16mm film stock stands as a testimony of the industrial practices that were necessary for the home movie market

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38 For a detailed description of each copy, see the technical data sheets in the appendix.

to flourish, and as such offers a different perspective on the phenomenon. Movies for home viewing were not necessarily shot by amateurs: there was a thriving market of 16mm reductions of theatrical releases for home screenings, created and exploited by companies such as Castle Films in the United States, and San Paolo Film in Italy. Nitrate 16mm films belong to this side of home movie consumption, rather than to the amateur (or avant-garde) aspect with which small gauge film is often identified.

To stick with the San Paolo Film case, using nitrate 16mm film for distribution prints would have been unthinkable. One of the selling points of small gauge projection rooms was the convenience of not being subjected to the strict safety rules that governed theatrical exhibition. Nonetheless, as I reported earlier, several exhibitors complained because their theater was shut down by authorities as not compliant with projection safety rules. Given this premise, no exhibitor would have accepted to project nitrate film in a small parish theater, and San Paolo Film was attentive enough to the requests of its customers to not risk renting flammable film to unsuspecting exhibitors. As for negatives, no rules explicitly prohibiting the manufacture of 16mm nitrate stock was in place. After all, negative nitrate 28mm film stock was not uncommon.[39] In Italy, the law regulating film exhibition at the end of the 1940s established that small gauge film screenings must be performed exclusively with non-flammable film stock.[40] Since negatives were not projected, no safety issues were at stake. As regards the standards set by SMPE in 1935 to uniform 16mm production in the United States, and later adopted in Europe

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39 28mm was another amateur film format. See Anke Mebold and Charles Teppermam, "Resurrecting the Lost History of 28mm Film in North America," in *Film History* 15.2 (2003): 137-151.

40 Reported in Gianni De Tomasi, "Formato ridotto," in *Bianco e nero* 3 (May 1948): 79-80.

as well, they concerned the size of the film strip and the frame, while no mention was made of the type of film stock.[41] After all, the chemical composition of the film stock would not affect the functioning of cameras, printers, and projectors. Nonetheless, the use of safety stock for small gauge films was an established practice, and any deviations from this norm are highly unusual to the point of being considered virtually impossible. Before asking why this happened, it is necessary to establish in what years exactly this anomaly took place.

The copies on 16mm nitrate film stock in the San Paolo Film collection refer to five features and twenty shorts. The shorts are for the most part animated cartoons, originally distributed in the United States by Castle Films, Official Films, Pictorial Films, and Hollywood Film Enterprises.[42] These companies were active in the small gauge distribution circuit, therefore they must have acquired copyrights from the producers or the original theatrical distributors. For instance, Hollywood Film Enterprises had the small gauge distribution rights for Disney shorts: therefore, knowing the original release date of the films is not helpful in determining the year in which the 16mm copies were struck. Moreover, titles were often changed for 16mm releases, and it is often difficult to establish which was the original distribution title of the copy in question. The task is made even harder by the fact that no catalogs for these companies seem to survive, with the exception of Castle Films.[43]

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41 SMPE stands for Society of Motion Picture Engineers. In the following years, it would change its name in SMPTE (Society of Motion Picture and Television Engineers). The adoption of SMPE standards in Europe, and in particular in Italy, is detailed in Libero Innamorati and Paolo Uccello, "Il film 16 millimetri," in *Bianco e nero* 6 (June 1939): 28-60.

42 Information derived from the title cards on the copies themselves.

43 Scott MacGillivray, *Castle Films. A Hobbyist Guide* (Lincoln, NE: iUniverse, 2004).

One key detail to keep in mind is that these negatives were printed in Italy, even though some of the titles are in English. The edge code on the 16mm films is "Ferrania," the name of the only Italian film manufacturer, which did not have branches in the United States. It is theoretically possible (though highly unlikely) that the American distribution companies had imported Italian film stock from Italy, and that San Paolo Film had imported the negatives from the United States to strike release prints in Italy. However, San Paolo Film used to acquire *positive* prints from which to strike negatives in its own laboratory (or in independent ones, until 1952). Since it is safe to assume that San Paolo Film itself commissioned the print of the negatives, for reasons that I will explain shortly, this must have happened after 1947, the year in which the company (then R.E.F.) entered the distribution business. The nitrate 16mm negatives must therefore have been manufactured between 1947 and the year in which San Paolo Film actually released them. Considering that the Disney-Hollywood Film Enterprises shorts were theatrically released between 1933 and 1935, it is clear that the original release date of a film can be misleading for dating a particular copy.

The date of the American release for three of the animation shorts on nitrate 16mm film stock can be resumed from the copyright notice on the title cards. *Three Little Bruins Make Mischief!* (theatrical release date not identified) was distributed in the small gauge market in 1946; *Hollywood Matador* (Walter Lantz Productions, 1942) and *Peg Leg Pete the Pirate* (Paul Terry, 1935) in 1947.[44] These dates confirm the hypothesis that the *terminus post quem* for the nitrate 16mm films in the San Paolo Film collection is in fact 1947. With regards to these titles, a

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44 MacGillivray, *Castle Films*, 280; 309; 339. *Hollywood Matador*'s copyright notice on the "The End" title card reports the date 1948.

further clue is provided by some papers conserved at the Society of Saint Paul's archive in Rome. The document "Situazione R.E.F. al 31/5/1947" reports an agreement with the Universal studio to import 1,000,000 meters of American film ("pellicola americana"). Universal, which was trying to enter the small gauge market, had taken control of Castle Films on January 1, 1947. Castle Films would retain its logo, which was already well known at the time, and would distribute Universal titles in 16mm. The first films released after the merge were Terrytoons cartoons (including *Peg Leg Pete*) and Walter Lantz cartoons (including *Hollywood Matador*). In the credits of these copies, the logo of United World Films, Inc., the branch of Universal specialized in small gauge distribution, is in fact placed underneath the Castle Films logo.

Even though the phrasing of the document is ambiguous, as the term "pellicola" can indicate both film stock and individual films, it is highly unlikely that Universal was exporting unprocessed film stock to Italy. Most likely, the document was reporting an agreement with the American studio for the import of Universal films to be released in the Italian small gauge market. A later passage in the document, more clearly phrased, confirms that the films would be shipped from the United States by the end of June. Although no titles are specified, it is very likely that the films in question include the three shorts I have been discussing, which are the only copies in the nitrate 16mm group with the original title cards in English. Besides providing a *terminus post quem* for the manufacture of 16mm film stock, this document and the films it discusses also show that R.E.F. had started importing unreleased films from abroad way before the acquisition of the Rank catalog in the early 1950s. Since the very beginning, the small gauge market in Italy was offering titles not available for theatrical distribution. It would have been much easier and more economical to acquire these titles from Italian distributors, as R.E.F. was

regularly doing for the Italian versions of foreign films. In this case, these titles were evidently not available on the domestic market. This is a further proof of the vitality and the independence of the small gauge circuit, which not only was able to reach disadvantaged parts of the country, but was also able to offer an experience unavailable in regular movie theaters.

In order to find a *terminus ante quem* for the manufacture of nitrate 16mm film stock, it is helpful to establish when the copies were released in Italy. The magazine *Vita pastorale* advertised new R.E.F. releases every month. Even though the shorts were not listed title by title, the first mention of "numerous shorts and topolini to complete the shows" appears in January 1949.[45] The January-February 1950 issue of *Vita Pastorale* informs of the availability of three hundred copies of "topolini," and in March the reduction of ten new titles was announced.[46] After that, no further mention of shorts and cartoons was made in the film advertising section of the magazine.

Thanks to these data, it is possible to deduce that the nitrate 16mm films in the San Paolo Film collection were made between 1947 and 1950. However, since these copies are all negative, the *terminus ante quem* should be moved back a few months, to take into consideration the temporal gap between the manufacture of the unprocessed film stock (which in this case would be the key part of the process), the printing of the negatives, that of the positives, and the actual release of the films. Nonetheless, since it is impossible to retrieve precise information regarding the length of this period, it is safer to maintain the month of March 1950 as the latest possible date for the production of the 16mm nitrate film stock.

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45 "Cinematografo," in *Vita pastorale* (January 1949): 13.

46 "Elenco dei film," in *Vita pastorale* (January-February 1950): 20; and "Film 16mm ridotti nel 1950," in *Vita pastorale* (March 1950): 43.

Among the short films included in the group, two are not animated films: their titles are *L'ultima avventura di "Stanlio,"* a Laurel and Hardy short, and *Porca l'oca... che paura!*, a Larry Semon comedy short. As the titles in Italian suggest, these films were not acquired from the United States, but reduced from dubbed release prints. This detail is confirmed by the end credits, which in both cases list Nino Giannini as the person in charge of dialog adaptation and Titanus as the recording studio. Even though I could not retrieve any information regarding the original title of these films, they are presumably part of the same group of shorts and cartoons that were released together with the features between 1947 and 1950. In fact, later in the 1950s San Paolo Film started editing shorts and cartoons together to create anthologies (present in a considerable amount in the San Paolo Film collection) to be released as features, which suggests that the company had found a more lucrative way to exploit these shorts. In addition to this, the physical conditions of the shorts, very similar to those of the animation shorts I discussed earlier, suggest that this group of film was manufactured in the same period and stored in the same environment.

The group of nitrate 16mm films also includes some feature films, all pre-1947: *Le avventure di Pinocchio* (Gianni Guardone, 1947), *Idillio a Budapest* (Giorgio Ansoldi and Gabriele Varriale, 1941), *La coda del diavolo*, *Le nuove avventure di Tarzan* (*The New Adventures of Tarzan,* Wilbur McGaugh and Edward Kull, 1935), *I cavalieri della notte* (*Riders of the Dawn,* Robert N. Bradbury, 1937). Of these features, both the picture-only and the soundtrack-only elements are conserved in the San Paolo Film collection, in separate reels – except for *Idillio a Budapest*, of which only the soundtrack survives.[47] In addition to the feature,

47 The soundtrack of *Le nuove avventure di Tarzan* is on Gevaert safety film stock.

the trailer for *La coda del diavolo* (scene and soundtrack) is on nitrate 16mm film stock as well. The dating of these features is easier than that of the shorts, as their release was advertised on *Vita pastorale* – exception made for *La coda del diavolo*, which I will discuss shortly.

Idillio a Budapest was part of the first group of films reduced and distributed by R.E.F.: its released was advertised as early as October 1947.[48] The 16mm of *I cavalieri della notte* came out in January 1949;[49] that of *Le avventure di Pinocchio* in the summer of the same year;[50] *Le nuove avventure di Tarzan* is in the list of films reduced in 1949 published in January 1950.[51] *La coda del diavolo* is not mentioned until 1959, when the title appears in a San Paolo Film catalog. It is possible that, since there are lacunae in the surviving catalogs, the film had been released previously and re-released in 1959. However, this absence from any magazines advertising 16mm releases suggests that in fact *La coda del diavolo* was not distributed until the end of the 1950s. The print sheet conserved together with the pre-print elements is dated 1956, which would confirm this hypothesis; however, since the positive may have been printed several years after the negative, this detail could be misleading for dating the nitrate 16mm copies. A more significant clue is provided by the original can in which the negative was stored, which is labeled with the logo of the Cineindustria lab in Rome. Since San Paolo Film opened its own laboratory in 1952 at the latest, the negatives of *La coda del diavolo* must have been made before then.

With all probability, then, all the nitrate 16mm negatives in the San Paolo Film collection (including *La coda del diavolo*) were made between 1947 and early 1950. In order to find out

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48 "L'Apostolato del "Cinema" a servizio delle Sale Parrocchiali," in *Vita pastorale* (October 1947).
49 "Cinematografo," in *Vita pastorale*, (January 1949): 13.
50 "Chiaroscuro nell'attività del passo 16mm," in *Vita pastorale*, (June-July 1949): 96.
51 "Elenco dei film," in *Vita pastorale* (January-February 1950): 20.

more about the possible reasons for this industrial anomaly, and the dimensions that this phenomenon might have acquired, it is necessary to examine the place where the unprocessed film stock was manufactured: Ferrania.

How Film Was Born from Gunpowder: Ferrania

Ferrania, the only Italian film manufacturer, was born out of the industrial reconversion of a cellulose-based gunpowder factory. In 1914, S.I.P.E. (Società Italiana Prodotti Esplodenti) opened a plant in the small town of Ferrania, in North-Western Italy. Towards the end of World War I, SIPE realized that it was necessary to diversify its activities in view of the post-war reconversion. Since the materials and equipment used for the production of powder B were the same used for the manufacture of photosensitive materials, it was logical to direct investments in this direction. In 1917, S.I.P.E. opened the society F.I.L.M. (Fabbrica Italiana Lamine Milano), which included a division for the manufacture of film materials. The technical part of the new activity was entrusted to the French Pathé Frères.[52]

The film manufacturing activity of the company began in 1920, but the financial results were disappointing. For this reason, Pathé Frères decided to cede its block of shares to Credito Italiano free of charge. F.I.L.M. seemed to be doomed to bankruptcy shortly after its birth, and a new administrator, Franco Marmont du Hautchamp, was appointed with the express task to

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52 See Angelo Salmoiraghi, *Ferrania dalle antiche ferriere all'industria dell'immagine*, (Savona: Marco Sabatelli Editore, 1992) and Luca Giuliani, *"*Una volta si scriveva così: *Ferrania,*" in Vincenzo Buccheri and Luca Malavasi (eds), *La materia dei sogni. L'impresa cinematografica in Italia* (Rome: Carocci, 2005), 61-62.

liquidate the society. However, Marmont du Hautchamp had an intuition that not only saved the company, but marked the beginning of its rise: the motion picture positive was put on sale with a 40% loss on the costs of production. Sales rose rapidly, and, thanks to the significant decrease in production costs over the years, F.I.L.M. balanced its budget in 1926.

Thanks to its newly-found financial stability, F.I.L.M. could start experimenting on new film stocks, and broaden the range of its products. Among other things, in 1930 the company launched the first Italian 16mm film stock on the market. The 1930s were a crucial period for the development of the society, which acquired other businesses and changed its name to "Ferrania: Fabbriche Riunite Prodotti Fotografici FILM e Cappelli." In 1938, the company eventually rebranded itself just Ferrania, the name by which it would be known worldwide. Its plants were constantly expanding, and new branches for manufacture and research were built. Ferrania's activity was articulated in four sectors: research, processing, testing, and technical implementation. The work was organized methodically: Ferrania could not afford mistakes or imprecisions, due to the delicate nature of the manufacture of film stock and emulsions.

The results of Ferrania's activity exceeded the expectations. Thanks also to the drive for self-sufficiency of the Fascist government, which guaranteed a constant stream of commissions on the part of Italian production and distribution companies, Ferrania became an exemplary factory which not only kept up its production schedule despite the ever-growing scarcity of raw materials, but managed to continue its research on new products, which would help the company keep pace with foreign manufacturers. Ferrania launched its first panchromatic negative film

stock Ferrania B in 1934, followed at the end of the 1930s by the C5 and C6 negatives, which were employed extensively in Italian filmmaking at the time.[53]

The Fascist politics of self-sufficiency had a key role in the evolution of Ferrania. In 1942, the Ministry of Popular Culture established severe rules to limit the import of unprocessed film stock from abroad. Given the scarcity of raw materials, these rules had the effect of limiting the national production of feature films, both in number (it was not possible to make more than eighty features per year) and in length (the maximum footage allowed was 2,500 meters). Ferrania was explicitly named as the company to which every laboratory had to turn to in order to have the amount of film stock to which they were entitled, upon request of production or distribution companied and upon submission of an "assignation stamp" provided by the Federazione dello Spettacolo.[54] That same year, an international symposium was held in Budapest to discuss a plan to make each European country self-sufficient as regards the production of materials necessary to filmmaking, including film stock.[55]

The strong governmental support, though, was not enough to help Ferrania solve some basic issues, *in primis* the strong shortage of raw materials for the manufacture of film stock and for research on new products, to the point that the company's management even prohibited to throw away wastepaper.[56] A campaign to recycle the silver contained in film emulsion was also started, but neither measure could solve the main problem: the shortage of raw materials

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53 See Salmoiraghi, *Ferrania*, 192; and P. A. Cassinis, "Una pellicola pancromatica italiana della "Ferrania," in *Cinema* 87 (March 10, 1940).
54 See "Cinema gira," in *Cinema* 7.2 (December 10, 1942).
55 Ibid.
56 Salmoiraghi, *Ferrania*, 131.

necessary for the manufacture of film stock and emulsion, such as gelatin and cotton.[57] Nonetheless, Ferrania managed to continue its activity, and even started trials on a new color film stock in 1941 – two years before the war forced the factory to temporarily close. In the early 1940s, most color films were made in Technicolor, an American system with an excellent chromatic palette, but one important flaw: because of the technical complexity of the system, shooting a film in Technicolor was extremely costly. For European film stock manufacturers there was also an ideological issue in addition to the economic and technological factors. As Luca Giuliani writes in his account of Ferrania's venture into color film manufacturing,

> The commercial hegemony of the American company [Technicolor] gives an ideological spin to European attempts to reproduce color on film, which becomes the research for a "national" color for the defense of cultural values [my translation].[58]

In Europe, the search for a color film stock that could compete with the American one became more urgent in 1936, with the opening of a Technicolor factory in London and with the production of European color features and documentaries using American color systems – Technicolor, but also 16mm reversible Kodachrome. The only European company that was able to compete with the Americans was the German Agfa, which, thanks to its research on monopack emulsions, abandoned the old additive color systems to focus on a more technologically advanced subtractive one not based on Technicolor technology.[59] Alfa's research focused on the

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57 Giuliani, *"*Una volta si scriveva così: *Ferrania,*" 65.

58 Ibid, 65.

59 Monopack is a type of film emulsion made of three overlapped color layers, one for each subtractive primary color: cyan, magenta, yellow. Without entering too many technological details, suffice it to say that in order to project additive color film it was necessary to mechanically modify the projector by adding color filters in front of the lens. This inconvenience, which limited the diffusion of additive color systems, was solved with the introduction of subtractive color systems, which could be projected without the aid of special

photochemical reproduction of color, independent from color filters to be placed in front of the projector's lens. The technology experimentation by Agfa was so advanced that the company's patents became part of the spoils of war for Americans, which used them to perfect the Eastmancolor system – the most widespread color film from the 1950s onwards.

At the end of the war, with Agfa losing any rights on its patents because of Germany's defeat, the only European factory to manufacture color film stock was Ferrania. With the collaboration of some Agfa technicians who took shelter in Switzerland during the occupation of the Wolfen manufacturing plant, in 1947 Ferrania launched Ferraniacolor, the only European color film stock in the post-war period. In the following years, Ferraniacolor affirmed itself both in Italy and abroad. The first documentary short to be shot with this system was *Ceramiche umbre* (Glauco Pellegrini, 1949), and the first feature was *Totò a colori* (Steno, 1952). Ferraniacolor was also used for small gauge films and for still photography, apparently with good results.[60]

Despite the initial enthusiasm, though, the golden age of Ferraniacolor did not last for long: the company's color tests were discontinued in 1958. Although there were some technical issues involved in this decision, the main factor was the acquisition of half of Ferrania's stake on the part of Technicolor, which had just opened a branch in Rome. This event was heavily criticized, both by the press and by the factory's workers.[61] Nevertheless, the change of ownership put a stop on the research on color, and the manufacture of Ferraniacolor continued

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equipment.

60 See Cesare Colombo (eds), *Scritto con la luce. Un secolo di fotografia e di cinema in Italia* (Milan: Electa, 1987), 158.

61 See, for instance, "Partita grossa a carte scoperte?," in *Cinema* 80 (February 15, 1952): 64.

with the only purpose of providing Technicolor with negative film from which to derive the three matrices used in the Technicolor system. Despite its brevity, the season of Ferraniacolor was extremely influential not only on Italian cinematographers, but also on the climate of experimentation and exchange of expertise between technicians, operators, and directors of photography, who were often working closely with one another. As Giuliani argues, this may be the most important heritage of Ferrania, which, despite discontinuing its work on color, was able to capitalize on the experience to improve the quality of its black and white film stock, which for many years was considered one of the best on the market. Directors such as Pier Paolo Pasolini, with the collaboration of cinematographers who spent their formative years working with Ferraniacolor, pushed black and white to the maximum of its expressive capabilities in films like *Mamma Roma* (Pier Paolo Pasolini, 1962), *Il vangelo secondo Matteo* (Eng. Title *The Gospel According to St. Matthew*, Pier Paolo Pasolini 1964), and *Uccellacci e uccellini* (Eng. Title *Hawks and Sparrows*, Pier Paolo Pasolini 1966)[62] – all photographed by Tonino Delli Colli, who was the cinematographer of *Totò a colori*, as well as other Ferraniacolor films.[63]

Ferrania's adventure was interrupted in 1964, when the company was bought by the 3M group from St. Paul, Minnesota. 3M gradually discontinued the manufacture of film stock, until this activity completely ceased in 1982. However, in recent years the factory reopened with its historic name, FILM Ferrania, and resumed the production of both color and black and white film stock. As of 2017, FILM Ferrania is the only factory devoted exclusively to the manufacture

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62 All these films were shot on Ferrania P30 negative film stock, which was released in 1959 – the year after the manufacture of color film stock was discontinued.

63 For an account of various black and white emulsions manufactured by Ferrania and their influence on Italian cinematographers and directors, see Guido Bezzola, *Dalla Ferrania alla 3M. Una storia di cultura umana e imprenditoriale* (Milan: Gruppo 3M Italia, 1994), 19.

of analog film, and the new company's mission is in line with the drive to re-appropriate the film experience fostered by the introduction of the digital that I discussed in my second chapter. In the same years in which film has been declared dead, FILM Ferrania "aim[s] to restore confidence in the future of analog film."[64] Regardless of whether the company will succeed in its task, twenty-first-century Ferrania proves that, even at the industrial level, obsolescence has had the effect to revamp interest in the potential of the old medium.

R.E.F. and Ferrania in the Years 1947-1950

From the account that I made of the vicissitudes of San Paolo Film and Ferrania, 1947-1950 emerge as key years in the history of both companies. Nonetheless, it is difficult to establish exactly which events taking place in this time frame led to the manufacture of 16mm film on nitrate stock, a definite departure from an established industrial practice. In the case of Ferrania the difficulty arises mostly from the scarcity of primary sources and patents that would help shed light on the phenomenon. Since the acquisition of the company on the part of 3M in 1964, the papers documenting the technical activity of the factory have been progressively destroyed, or lost in the numerous reconversion phases of the plant. Even from the perspective of industrial historiography, the nitrate 16mm film reels are the only surviving testimonies of their own history and of a stage in the history of the companies related with their manufacture and dissemination. As such, in their very material existence they embody a forgotten industrial practice and are one of the few available primary sources that can help reconstruct it. The only

64 http://www.filmferrania.it/, accessed May 14, 2017.

thing that can be done in this case is trying to highlight possible relations between the objects themselves and the events that occurred in the years in which they were manufactured, processed, and distributed. The main object of investigation must therefore be the material itself, which is also the clue that allowed one to see (or, better, smell) the exceptionality of these objects in the archive: cellulose nitrate.

Ferrania inaugurated the plant for the casting of cellulose in 1920. Since then, cellulose nitrate was used for the manufacture of 35mm film stock until 1954, when it was substituted by non-flammable cellulose triacetate in order to comply with the American standards in place since 1951. Actually, according to the testimony of a former Ferrania employee who was hired in 1961, stockpiles of nitrate were still present in the factory warehouses until the 1960s, when they were finally disposed of.[65] Although the Ferrania technician does not remember the exact year of the disposal of nitrate, it is safe to assume that it took place around 1964, either right before or after the acquisition of Ferrania on the part of 3M. Whatever the exact date may be, what is significant is that nitrate was still stored in Ferrania facilities long after film stock manufacture switched to triacetate, and it is not at all certain that it was not used after 1954, by mistake or otherwise. Nitrate 16mm is therefore not the only nitrate-related anomaly in the history of Ferrania. Why were provisions of nitrate still stored in the 1960s, when, in theory, they had been rendered useless for years? A look back to the period when nitrate 16mm film stock was manufactured could be helpful for determining the reasons behind these unorthodoxies.

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65 Private conversation between the author and a former Ferrania employee who prefers to remain unnamed.

As I mentioned earlier, the main problem for Ferrania in the immediate pre- and post-war periods was the shortage of raw materials for the manufacture of film stock. Presumably this issue did not concern only nitrate, but also, and probably to a greater extent, triacetate, whose manufacture was inaugurated in 1930 together with the production of small gauge film stock. Since safety material was more costly and less reliable, it is highly likely that the difficulties were greater than with nitrate. This is confirmed by the fact that the shortage of raw material delayed the experiments on 16mm reversal film stock, which was manufactured in cellulose triacetate. To make matters worse, the years when raw materials were harder to find coincide with the period in which 16mm was becoming extremely popular. In the United States, 16mm films were used for numerous purposes, including military training and war-zone documentary filmmaking during the Second World War. The quick rise in demand for 16mm film created industrial anomalies in the United States as well. Because of the cost and shortage of triacetate, for a short period of time small quantities of nitrate 16mm film were put in circulation. However, the American case is slightly different from the Italian one, insofar as the films retrieved in the United States were 35mm films which were slit with a 3mm loss and re-perforated by distributors to fit 16mm cameras and projectors. They looked exactly like 16mm films, but were originally manufactured as 35mm.[66]

Slit 35mm in the form 17.5mm film is not uncommon, especially for soundtrack-only pre-print materials, and some copies are present in the San Paolo Film collection as well. Nitrate 16mm film as the result of slit (with a 3mm loss) and re-perforated 35mm film is definitely more

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66 This information was provided to the author by Ed Stratmann, former Associate Curator of Motion Pictures at the George Eastman Museum in Rochester, NY, and by Paolo Cherchi Usai, Senior Curator of Motion Pictures at the George Eastman Museum in Rochester, NY.

rare. However, the Ferrania 16mm nitrate case is different, insofar as the reels came out of the factory in the form of 16mm film, rather than being the result of successive alterations. The proof for this claim is in the codes printed on the edge of the film strip: although, unfortunately, Ferrania did not employ symbols identifying the year of manufacture of the film stock as Kodak did, the Italian company did use two different styles for its 35mm and 16mm edge codes. The logo on the 16mm nitrate films in the San Paolo Film collection is undoubtedly the one used by Ferrania for its 16mm film stock. A comparison between the 35mm and the 16mm logos shows their stylistic difference – see figures 1 and 2 in the next page.

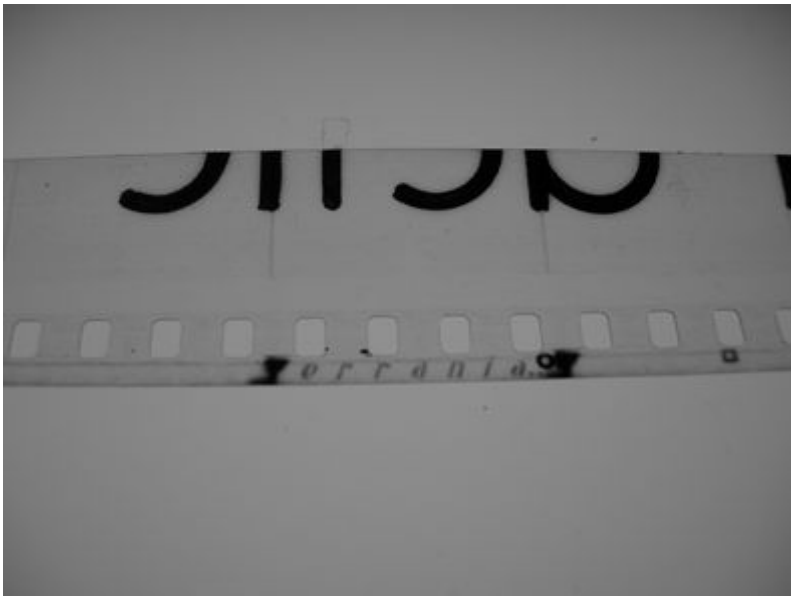

Figure 3.1: Slit 35mm film (17.5mm) with 35mm-style Ferrania logo and 35mm perforations. San Paolo Film Collection.

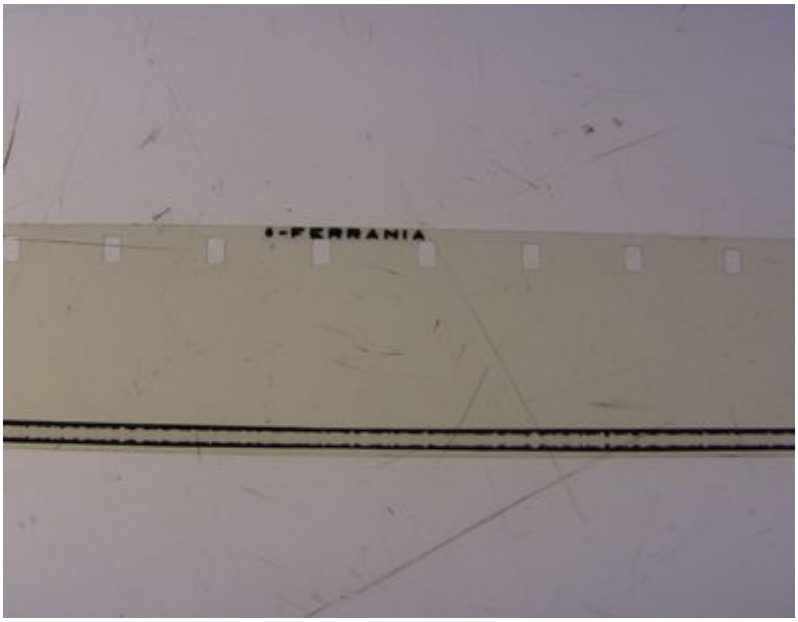

Figure 3.2: 16mm film with 16mm-style Ferrania logo and 16mm perforations. San Paolo Film Collection.

As regards the diffusion of 16mm film, the Italian situation was not different from the American one. Small gauge cameras were used for shooting war documentaries, and after the Second World War 16mm films were used for a variety of purposes, including military training – as testified by the purchase of several small gauge projectors on the part of the Ministry of Defense.[67] Furthermore, as previously discussed, the post-war period saw the proliferation of a substantial number of 16mm distributors. Specialized magazines were published, and in their pages several distribution companies advertised their new releases. In addition to San Paolo Film (or R.E.F., as it was called at the time), companies like Ala Film, Angelicus, Cine Sud, Cinexpress, Globus, Imperialcine, and many others were trying to claim their share in the newly-opened market. Even American companies such as MGM, Universal, and Warner Brothers were active on the Italian small gauge market, which was as crowded as it was promising.[68] The sudden flourishing of companies needing 16mm film stock for their business must have seriously aggravated the already precarious raw material situation. It would therefore not be surprising if Ferrania, even for a short period, had decided to use the cheaper and more reliable cellulose nitrate to manufacture batches of 16mm film as well.

This hypothesis would also fit with the situation of R.E.F. in the same years: finding itself in debt and in need of money to get the small gauge distribution business started without abandoning its production efforts (although on a much smaller scale than before the war), R.E.F. might have made an agreement with Ferrania for the purchase of nitrate 16mm film stock at a lower price. The key connection here is the reference to "film stock stamps" in one of R.E.F.

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67 See "Passo ridotto per avieri e marinai," in *Libero orizzonte: Mensile di cinema ridotto* 6 (June 1948).

68 See *Libero orizzonte: Mensile di cinema ridotto* (1946-1952).

financial reports from 1947. As I wrote earlier, the self-sufficiency policy put in place by the Fascist government before the war included a standardized procedure of acquisition of film stock to make sure that the official provider of the product would be Ferrania. Laboratories, upon request from production and distribution companies, would present Ferrania with the "film stock stamp" necessary for the purchase. The reference to "film stock stamps" in the R.E.F. report from 1947 suggests that the practice survived the end of Fascism and its self-sufficiency policy, and was still in place after the war. It also suggests a direct line of communication between producers and distributors, laboratories, and Ferrania. Although the laboratories were in charge of the purchase of film stock, they could do so only upon request of their customers (producers and distributors), who would presumably also pay for the material. This mechanism suggests that, if in fact a deal was struck between Ferrania and R.E.F., labs, as the *trait d'union* between producers/distributors and film stock manufacturers, must have been aware of it. In addition to this, the original cans in which the nitrate 16mm negatives were originally stored have the logos of different laboratories, so broadening the range of technicians who came in contact with the material. The fact that film stock was handled by so many people makes it unlikely that nobody, from Ferrania, to film labs, to R.E.F., noticed the oddity of the material, and makes the hypothesis of a simple mistake on the part of Ferrania highly improbable.

How widespread was the nitrate 16mm phenomenon, then? Was it limited to R.E.F., or did other companies purchase the same kind of material from Ferrania? It is nearly impossible to give a definite answer to these questions, for two different reasons, one historical, the other archival. As I have already demonstrated, R.E.F. was far from being the only company in the small gauge distribution business in Italy at the time. The shortage of raw materials for the

manufacture of safety film stock must have affected other companies as well, and, since all of them were relying on Ferrania, it is not far-fetched to assume that similar materials might have circulated more broadly. For instance, the logo of one of the companies active in the 16mm distribution business, Globus Film, appears in the credits of one of the 16mm nitrate negatives in the San Paolo Film collection – *L'ultima avventura di "Stanlio."* Even though R.E.F. used to acquire positives from other companies, the lack of standardized practices in those years makes it far from impossible that that negative might have been struck for Globus Film in the first place, and subsequently sold to R.E.F.

The other reason has to do with the difficulty of spotting nitrate 16mm film in an archive. Whoever comes across a reel of 16mm film usually takes for granted that it must be on safety stock. In addition to the fact that the technical literature claims that such materials do not exist, it is not unusual to find 16mm film reels made of diacetate, a safety material that smells similar to nitrate, though it does not burn as nitrate does. As far as archival issues go, there is also another problem: due to lack of funding and shortage of staff, most film collections are not inspected for years, if not decades, unless they contain materials that are needed for projection or preservation work. The nitrate 16mm films in the San Paolo Film collection are on negative film stock, hence not projectable, and contain films that are not unique, often available in better-quality copies, and sometimes incomplete, which makes them nearly useless for preservation purposes. Had it not been for the inspection campaign that the Museo Nazionale del Cinema in Torino carried out upon acquiring the collection, these unique materials would have gone unnoticed for even longer. That would have constituted a serious safety hazard, besides preventing this research from being done.

Archival Objects as Clues

The case of the nitrate 16mm films can be instructive on many levels, archival, historical, and theoretical. It highlights some overlooked aspect of film archival work, chiefly the perceptual activity involved in dealing with archival objects. Although this aspect is nothing new, and is well known to whomever has worked in an archive, its implications are worth exploring further. In her book *The Allure of the Archive*, Arlette Farge recounts a strange archival encounter. Pressed between the pages of a centuries-old documents, a pouch of seeds accompanies the letter from a country doctor reporting the existence of "a young girl, sincere and virtuous, whose breasts discharge handfuls of seeds each month."[69] Farge indulges in the description of the sense of reality that the encounter with these objects fosters – a reality long gone and yet present not only to her eyes, but also to her touch – but she also elaborates on the historiographical and epistemological bearing of such odd archival discoveries. She writes:

> The physical pleasure of finding a trace of the past is succeeded by doubt mixed with the powerless feeling of not knowing what to do with it. […] The sun-colored seeds […] are at the same time everything and nothing. Everything, because they can be astonishing and defy reason. Nothing, because they are just raw traces, which on their own can draw attention only to themselves. Their story takes shape only when you ask a specific question to them, not when you first discover them, no matter how happy the discovery might have been.[70]

Farge seems to imply a distinction between the material presence of the object, which solicits a sense of wonder and sensory pleasure, and their historiographical relevance, which

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69 Arlette Farge, *The Allure of the Archive*, trans. Thomas Scott-Railton (New Haven&London: Yale University Press, 2013), 10.

70 Ibid., 11.

needs to be interrogated with the correct research questions in order to emerge. In other words, the material presence of the seeds is what is "astonishing and def[ies] reason," whereas their interrogation and translation into language is what turns them into potentially valuable historiographic evidence. Although it is certainly the coding of the materiality of objects into language that allows history to be written, I would challenge the distinction between materiality and epistemological value, and also the exclusive attention to research questions as turning a contingent detail into generative evidence. By reading the letter that accompanies the seeds, Farge was able to make sense of them. In other words, by acquiring a certain knowledge, she was able to perceive them differently – not as objects casually ended up into a pile of documents and there left for centuries, but as the supposed proof of the country doctor's story. In this context, the presence of the seeds becomes meaningful even before specific questions are asked to them. As such, they are clues in the sense that Carlo Ginzburg attributes to the term.[71]

Whether objects can become clues does not depend only on the questions that are asked to them, but also on the previous knowledge of the observer, which allows him or her to perceive them differently, as clues rather than contingent elements that "can draw attention only to themselves." Perception is in itself an epistemological activity, though an often imperfect one. A historian of agriculture would see those seeds differently than a historian of gender, even before formulating specific research questions.[72] This was the mechanism at play in the discovery of the nitrate 16mm films: my archival expertise allowed me to perceive those objects differently, and

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71 See Introduction.

72 For a similar perspective on the relationship between perception and knowledge, see Norwood Russell Hanson, *Patterns of Discovery: An Inquiry Into the Conceptual Foundations of Science* (Cambridge: Cambridge University Press, 1958).

therefore to turn them into generative evidence of broader historical events. The key epistemological activity was first and foremost perceptual, and my perception was shaped by my previous knowledge. This mechanism also challenges the primacy of sight as "the noblest of senses," insofar as less highly-regarded senses, such as smell, turned out to be more helpful in establishing the real nature of those archival objects.[73] How digital technology challenges this mechanism is clear. Digital files do not challenge our perception in the same way as analog film does and, in the case of digitized films, obliterate the materiality of the original object to turn it into a completely different physical artifact.[74] In her foreword to *The Allure of the Archive*, Natalie Zemon Davis pinpoints the issue very well. Speaking of the digitization of paper archives, she writes:

> [With digitization,] there is the loss of the object itself, of the marginal notations missed by the camera, the signatures cut off, the paper not available to the touch, the bindings unseen. [T]he strange sack of seeds that Arlette Farge found among the documents are missing from the digital world.[75]

Even if the digitization of a document did not leave out all these elements, they would not be the same as in the original artifact. Digitized seeds are no longer seeds: they are pixels. The same argument could be easily applied to film, where the digitization of an analog print leaves out clues such as edge codes, perforations, leaders, type of film stock. If it is true that the same happens in a film-to-film duplication, the result of digitization will not just have different

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73 For an account of the philosophical and historical primacy of sight over the other senses, see Hans Jonas, "The Nobility of Sight," in *Philosophy and Phenomenological Research* 14.4 (1953): 507-519.

74 Although, it is worth repeating, the object undergoing digitization is not physically modified in the process, and this is the reason why it can become an archival object.

75 Natalie Zemon Davis, foreword to *The Allure of the Archive,* by Arlette Farge.

characteristics from the source object, it will be a completely different object, lacking those clues that are available in the analog world. Whether different clues are offered by a digital file, it is probably too early to say. Even if they did, their identification would require a different expertise than the one that allowed for the discovery of nitrate 16mm films.

But digitization, allowing us to see the materiality of film under a different light, also exposes the limitations of the analog vs digital binary. Not only is analog technology composed of several different technologies that little have in common with one another, if not for their being analogical; objects belonging to different analog technologies will also present different types of clues. Analog video does not have edge codes or perforations, and, most importantly, is not isomorphic in the sense that Giovanna Fossati attributes to the term. While D. N. Rodowick defines as isomorphic those media that do not require numerical transcoding, Fossati suggests a narrower use of the concept.[76] She writes:

> [O]ne may consider isomorphism in a different way and relate it to the observer. From this perspective also analog sound waves (or the analog video images) transcribed onto a magnetic tape would not be isomorphic, as the magnetic signal cannot be directly interpreted as sound or moving images by our senses. Also in this case a sort of transcoding process has occurred, even though within the "continuous" physical domain. Magnetic tapes, but also analog television, may well be considered part of a non-isomorphic representation process, even though they provide analog (continuous) representations.[77]

In Fossati's formulation, "analog" and "isomorphic" are not necessarily the same. According to her definition, isomorphism is a characteristic that distinguishes photochemical film from other types of analog media insofar as the frames on a film strip are only smaller (and

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76 Rodowick, *The Virtual Life of Film*, 9.
77 Fossati, *From Grain to Pixel*, 18.

static) versions of the moving images projected on the screen and can be seen directly on the film, even without projecting it, whereas in order to see what is on an analog video tape it is necessary to play it. Fossati's formulation is helpful insofar as it mirrors the inspection methods that are used in archival practices, and in so doing emphasizes the role of the observer and his or her relationship with the object observed. In the case of nitrate 16mm films, this definition of "isomorphism" is particularly relevant. Being negative elements, none of the nitrate 16mm copies could be projected.[78] Nonetheless, the isomorphism specific to film allowed me to have a fairly precise idea of the content of each reel just by looking at it on a rewind bench – exception made for the sound, which in fact is not isomorphic and is further proof of the variety of different technologies that are simply labeled "analog."

Even though the evidentiary value of film highlights the complexity hidden behind the simple "analog" label, and consequently smooths over the analog vs. digital opposition, the distinction between the two larger technologies is still significant. On the one hand, as I have shown in my first chapter, there is an ontological difference between digital and analog that reflects on their different modes of reproduction and in the different ways in which they bear the traces of their own history. On the other hand, there is another reason why the digital has indeed been a revolution unlike any other non-photochemical analog technologies, and it has to do again with archival issues. Despite their diffusion and the revolution they brought in movie-watching long before the advent of digital technology, non-photochemical analog technologies have never been substitutes for film in preservation practices. Analog video had long been used as an access

78 In addition to this, nitrate stock cannot be projected in most states for safety reasons, and the physical conditions of the vast majority of the copies would have rendered projection impossible anyway.

format, but was never considered as a preservation carrier. In other words, analog video copies of a film did not take film prints of the same title out of circulation, unlike what is happening with digital versions. This is certainly a consequence of the poor quality of analog video compared to photochemical film, but it also has to do with the freedom of modification that digital technologies provide to the restorers – a feature absent from analog video transfers. Therefore, both from a theoretical and a pragmatic standpoint, digital technology has revolutionized cinema in general, and archival practices in particular; at the same time, the revolution brought on by digital allows one to see the analog under a different light, and highlights the differences between different types of analog technologies that a simple analog-digital comparison obscures – *in primis* their evidentiary potential. Even though an analog video copy may contain clues, or function as a clue, it would do so in a completely different way from a photochemical copy of the same film title.

The case of the nitrate 16mm copies shows how the materiality of film is central to its nature as a potential bearer of clues, or as a clue pointing to broader phenomena, but it also shows the limits of the evidential paradigm itself. Throughout this chapter, I have often used expressions such as "it is likely," "it is possible," "probably," and so on. This would go against the premise of the evidential paradigm as something different from a gesture of interpretation, as expressions like these imply a certain degree of speculation in the statements that they introduce. However, rather than undermining the foundation of the evidential paradigm, the speculation necessary to establish relationships between objects and facts is a consequence of a lack of clues, rather than being due to an intrinsic unreliability of the clues themselves. For instance, if the patents for all Ferrania products survived and were accessible, it would not be necessary to

speculate on when nitrate 16mm film stock was manufactured. Even if the patent for nitrate 16mm film did not exist, but patents for other products were available, its absence would be as precious a clue as its presence. Without these documents, all that an historian can do is to connect dots between what is in fact available, and draw tentative conclusions based on these connections. The more scarce the clues, the higher the degree of speculation involved.

The identification of a clue itself, and the conclusions drawn from reading it as such, is not exempt from errors either. After all, the evidential paradigm and the method that it generated were born within the humanities and, as anything human, cannot aspire to the perfection and the general validity of mathematical systems. However, rather than being a limitation, this characteristic shows what the evidential paradigm can accomplish that universal methods cannot: it can lead to the knowledge of a singularity, be it an object, a work of art, a person, a fact, and of the characteristics that distinguish it from other individuals. Individuality is both the point of departure and the goal of the investigative method identified by Ginzburg. A few years after the discovery of the nitrate 16mm films in Torino, a similar event took place in Switzerland. Some 16mm negatives on nitrate stock were found in an archival vault, still in their original cans. The cans were labeled “nitrate,” and the edge code on the films was Fuji’s. Generally speaking, the Swiss discovery was not different from the Italian one: the objects found were made of the same type of film stock, so rare that it had been considered non-existent for decades. However, if one looks at the individual objects, the perspective changes radically: those films came from a different factory than the Italian ones, and, unlike the reels in the San Paolo Film collection, they were clearly labeled as nitrate. In addition to this, the collections to which the two group of films belong are different, and have different and probably unrelated histories. In other words, the type

of knowledge that it is possible to acquire by examining and investigating individual objects is different than the one that would derive from simply considering them as undifferentiated samples of a broader, yet very rare, technology. The history that I reconstructed, having to do with Italian laws, the Ferrania factory, and San Paolo Film, would not be relevant for the Swiss objects.

There is a possibility that the way in which I reconstructed the events that led to the manufacture of Ferrania 16mm nitrate film might be just wrong. Maybe, those objects are just the result of a mistake made by someone at the factory, and are therefore the result of chance rather than the outcome of a web of relationships between political history, industrial history, and film history. Even though, for the reasons I explained throughout this chapter, such a possibility is highly unlikely, it cannot be ruled out completely. Nonetheless, the research prompted by the discovery of these objects, and the clues that the object themselves presented, has contributed to unveil historical events that had been forgotten for decades, and that in turn might shed light on other details of post-war Italian industrial history. The fact that historiography is an imperfect activity does not mean that it should be discarded with a post-modern gesture of total, dooming skepticism. Facts do exist. Nitrate 16mm films are the clues that point towards a fact. It is certain that they were manufactured in a highly unusual material. It is certain that they were sold, used, circulated, archived. This is undoubtedly true whether the connections between objects, documents, and historical facts that I highlighted are exact or not. Further research may perfect the conclusions I have drawn, although it is highly unlikely that it will ever be possible to uncontrovertibly prove everything. Historiography is not an exact science. Nonetheless, the evidential paradigm shows how the type of knowledge attainable through its method is not

inferior to that of natural sciences: it is qualitatively different, and as such cannot be substituted by more general and exact methodologies. It is within the duties of the archivist and the historian to adopt rigorous methodologies that would make sure that the object is described as accurately as possible and the clues are read as carefully as possible, though with the awareness that complete objectivity just does not exist, at least in this field. At the same time, the openness of the results should be an incentive to perfect them with further research, rather than giving up on the reliability of historical narratives entirely.

Conclusion

The Humanistic Digital

The case of the nitrate 16mm that I examined in my third chapter is an example of the kind of knowledge that can be achieved through the examination of the materiality of individual objects. By shifting the terms of epistemic engagement with a film – that is, by using the content of the films as clues pointing to their material origin, rather than the other way around – it is possible to acquire historical information that would otherwise remain hidden. For instance, material clues are often followed to identify the titles of unknown films, as Harold Brown teaches in his book *Physical Characteristics of Early Films as Aids to Identification.* In the case of the nitrate 16mm films in the San Paolo Collection, conversely, the titles of the films were clues pointing to the year of the manufacture of the objects; by identifying the period in which some 16mm films were manufactured on nitrate stock, it was then possible to formulate hypothesis on the reasons and consequences of such a departure from a consolidate industrial practice. Through this method, the concept of film expands beyond its value as aesthetic object

or narrative text to branch out to broader historical issues pertaining to the spheres of industry, politics, religion, culture in general.

This example shows once more how complex the concept of cinema is, how many public spheres it engages, and how hasty it may be to declare it dead because of a technological change, though powerful as the transition to digital technology has been. But I believe that the example of the nitrate 16mm negatives also complicates further the issue of obsolescence that I discussed in my second chapter, and shows that obsolescence, on the smaller scale of individual objects, is nothing new for cinema. Those materials were obsolete way before 16mm was declared obsolete, insofar as they have been of no practical use since San Paolo Film struck prints from them. The company kept them in case they could be of use in the future, in fact used some of them again in the 1960s, then forgot about them.[1] When San Paolo Film closed its operations, those copies became virtually useless. From a preservation perspective, for instance, there are much better and more complete copies to be used than these dubbed, cut, shrunken, dirty 16mm reductions of popular titles. The nitrate 16mm films became archival objects, and as such important because of their value as historical evidence and primary sources for historiography, long before a discourse surrounding the obsolescence of cinema at the hands of digital technology was even possible.

Nonetheless, while this example shows that the process of "archivization" of film objects may have been been ongoing for longer than it was thought, it also shows once more why it is still key to distinguish between digital technologies, analog technologies, and photographic films as different archival objects, providing different kinds of evidence and necessitating different kinds of expertise to be identified and deciphered. The smell of film is absent from non-

1 Information on each copy examined, including details on related copies, is provided in the appendix.

photographic audiovisual media. There are no visible edge codes on a video tape. The perceptual acuity of the archivist might still be useful for non-photographic media, but it would definitely have to be readjusted to make sense of different types of evidence and identify different types of clues. From this perspective, the main difference between a film and a digital file stands in the different kind of evidence that they provide, and in the methods necessary to read it.

The case of the nitrate 16mm films shows how helpful the evidential paradigm is to find clues in a film object, and connect them to broader historical issues. This is important not only because it provides a methodology for the investigation of films as material objects, but also because it relates cinema and cinema studies to other disciplines that are based on the same paradigm. In other words, it reassess the value of approaching cinema from a humanistic perspective. Would this situation change in the digital age? Does the digital make it impossible to adopt humanistic methods such as the evidential paradigm for the study of film in general, and moving image objects in particular?

On May 12, 2017, unknown hackers launched the largest cyber attack to date on computers worldwide. Hundreds of thousands of users in more than one hundred and fifty countries were welcomed by a disturbing message upon turning on their computers. “Ooops, your files have been encrypted!,” hackers cheerfully announced from the computer screens in the British National Health Service, Spain’s Telefónica, America’s FedEx, and Russia’s MegaFon, as well as in thousands of other buildings worldwide. A ransomware with the mocking name WannaCry asked for a $300 or $600 dollar ransom in bitcoins in order to give back to users

access to their files. It is unclear how many institutions paid the ransom, or how much money the hackers, who are still unidentified to this date, managed to collect with this operation.

If it were not for the cyber nature of the attack, this story could be easily mistaken for a Fantômas adventure, or for an Edgar Wallace novel. The criminal masterminds who keep in check major institutions, including the police, with evil genius and bleak sarcasm, seem more appropriate to the twentieth-century novelistic imagination than to our digital reality. And yet, the similarities between recent news and the criminal methods of the Red Hand, or the disturbing pervasiveness of the Boundary Gang, are intriguing.[2] If the villains behind the WannaCry cyber attack resemble those of twentieth-century crime fiction, how about the detectives? Is sleuthing a relic of the past, superseded by the ability to manipulate immaterial numbers? The answer to this question is not so simple.

A few days after the attack, *The New York Times* published an article about the response to WannaCry's spectacular debut on the global crime scene.[3] The scale of the attack, and of most cyber attacks, makes the organization of a concerted response incredibly complicated. However, the issue is political rather than technical, insofar as a global effort to defeat this kind of criminals would necessitate a collaboration among governments who are usually unwilling to share intelligence information and resources. From a methodological perspective, things have not changed much from the era of the Sherlock Holmes. This is how Theresa Payton, former chief information officer of the White House, explains the cyber security methods in place today:

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2 The Red Hand is a criminal gang in Edgar Wallace's novel *The Fourth Plague* (1913), while the Boundary Gang appears in Wallace's *Jack o' Judgment* (1920).

3 Katrin Bennhold and Mark Scott, "How to Catch Hackers? Old-School Sleuthing with a Digital Twist," *The New York Times*, May 14, 2017, accessed May 31, 2017, https://www.nytimes.com/2017/05/14/world/europe/ransomware-cyberattack-wannacry-hacking.html?hp&action=click&pgtype=Homepage&clickSource=story-heading&module=first-column-region&region=top-news&WT.nav=top-news&_r=0.

> Before we get into who did it, we try to figure out if the bad guys still have access [to the infected computers.] Are they still hiding? Are they going to come back tomorrow? Is the door that let them in still ajar? Can they inflict more pain? And if so, where are they? […] How do we cordon them off to mitigate further damages?"[4]

The reference to the door left ajar, though clearly a metaphor, is an indicator of the application of traditional detective strategies to a digital context. As the authors of the piece explain, "Instead of searching the closets of a property that has been broken into, investigators will examine the affected server, online software caches and emails to identify any malware that might not have been activated yet."[5] Servers, caches, and emails serve the same purpose as the good old closet where the criminal might hide, and are therefore investigated accordingly. Patricia Lewis, the international security research director at Chatham House in London, is even more explicit in likening the hackers' actions and the necessary response to traditional detection methods. She explains that an email can be examined like a physical letter, and that the metadata it contains are like the envelope in which it arrives. Hackers are aware of it, and try to cover their tracks, but, according to Lewis, a good detective is able to trace the clues back to the real culprit. In her words, "They always leave digital bread crumbs that can be followed."[6]

Clearly, as I mentioned, the language used by these cyber security experts is rich in metaphors and similes. However, I believe that in this kind of language there is more than the desire to render accessible a complicated technological issue. Rather, the reference to "digital bread crumbs," to letters and envelops, to doors left ajar, is a symptom not only of the material aspect of digital technologies, but also of the employment of an investigation method that is more indebted to the evidential paradigm than to the quantitative research that is usually

4 Ibid.
5 Ibid.
6 Ibid.

associated with digital technology. Just as art connoisseur Giovanni Morelli could attribute paintings to certain authors based on the way in which details, such as ears and hands, were executed, digital detectives can tie a certain coding style back to the criminal.[7] In other words, digital detectives employ the Zadig method that I discussed in my introduction.

Can this method be applied to film, and in particular to digital preservations of analog films? Are there metadata that could be used to track the modifications operated on the file containing the digitized film? Will researchers of the future be able to see clues where an untrained eye can only see undistinguishable pixels? These are important questions that will need to be answered sooner rather than later. That digital technology has a materiality has been successfully argued by some scholars.[8] However, how to approach this materiality, and what kind of expertise is necessary to adopt the evidential paradigm in a digital context, especially with regards to moving image archiving, restoration, and preservation, is up for debate.

These issues have a relevance that goes beyond the field of film preservation, and even film studies, to affect the state of the humanities in general. In an era where the digital humanities are heavily employing quantitative approaches to humanistic issues, digital forensics show how the digital cannot do without the human. Even coding has a style, and that style can reveal the "hand" of its creator. If it is definitely true that a new kind of expertise is necessary to decipher these clues, it is also true that a quantitative approach would be insufficient for making sense of the individual traces that can lead to the knowledge of a singular event. As flawed as it may be, the evidential paradigm does not cease to be influential and useful even in the digital age. Rather than kicking the human out of the humanities, as Friedrich Kittler famously said, it is

7 Ibid.

8 See, for instance, Matthew G. Kirschenbaum, *Mechanics. New Media and the Forensics Imagination* (Cambridge, MA: The MIT Press, 2008).

necessary to reassess the importance of the human factor in the digital world. Next to the digital humanities, there is room for a humanistic digital.

APPENDIX

NITRATE 16MM FILMS IN THE SAN PAOLO FILM COLLECTION:

INSPECTION REPORTS

What follows are the inspection reports for the nitrate 16mm films in the San Paolo Film collection. Each inspection report includes the technical data for each print, filmographic data for each title (when available), and a short description of each copy. These reports were first filed in 2010, when the nitrate 16mm copies were found in the San Paolo Film collection at the Museo Nazionale del Cinema in Torino. They have been updated over the years to incorporate new research. Only the copies that I inspected personally are listed here. This appendix should therefore be seen not as a definitive list of the nitrate 16mm films in the San Paolo Film collection, but rather as an example of the type of clues that can be gathered from the analysis of a film object, and also of the limits of this type of investigation. At the same time, the description of these copies may be of help for further research on small gauge distribution strategies in post-war Italy.

Filmographic data were obtained by cross-referencing the copies themselves with other sources and databases, including the San Paolo Film catalogs, the American Film Institute catalog, the Library of Congress catalog, and trade press journals. Other sources are indicated in footnotes. A glossary of film inspection vocabulary can be found in Kodak's *Book of Film Care*.[1]

1 *The Book of Film Care* (Rochester, NY: Eastman Kodak Company, 1992).

L'ULTIMA AVVENTURA DI "STANLIO"

Figure 4.1: *L'ultima avventura di "Stanlio."*

TECHNICAL DATA

Accession Number: C17780
Location: SPN8
Format: 16mm
Film Stock: Cellulose Nitrate
Type of Element: Negative (picture-only)
Edge Code: Unreadable ("The End" title card: 4=FERRANIA SAFETY)
Footage: 1 reel (ca. 250m)
Physical Conditions: Poor

FILMOGRAPHIC DATA:

Original Title: Unknown (Eng. Translation: *Stan's Last Adventure*)
Director: Unknown
Year: Unknown
Production: Unknown
Small Gauge Distribution: Globus Film, G.B.Seyta
Italian Adaptation: Nino Giannini
Cast: Stan Laurel

When this copy was originally inspected in September 2009, it was erroneously cataloged with the title *Le ultime avventure di Stanlio e Ollio* (Eng. Translation: *Laurel and Hardy's Last Adventures*). It is likely that this was the title on the label on the original can, since the initial inventory reported several copies with this title. It is unfortunately impossible to verify this assumption, as the original cans were tossed and the information on them were not transcribed. This does not allow to track back the name of the lab where the copy was processed either. During this inspection, the title was transcribed directly from the opening credits of the copy. Since no Italian filmographies report films with this title, it was probably changed for the small gauge distribution of the short. From the opening credits it was also possible to establish that the film was distributed in Italy prior to its acquisition on the part of R.E.F.. The first title cards presents the logo of Globus Film, small gauge distribution company active in Italy in the 1940s, and the second reports the name of G. B. Seyta, also known as Giovanni Seyta, an Italian independent producer and distributor also active in those same years.

The physical conditions of the copy are poor. The main issues are warping, shrinking, and heavy tape residue – so extended that the film stock initially appeared to be decomposing. The film is heavily torn in several places, and some segments are missing. Most perforations are damaged, and some are torn. The photographic quality of the image is also mediocre, probably also because of the low quality of the source print – the opening and ending titles are of higher photographic quality. The source print was also on 16mm, as testified by the printed-through 16mm perforations. The contrast is very high, a sign that this is a later generation copy. The title card "The End" is on safety film stock, and was most likely added later.

THE GOLDEN GOOSE

Figure 4.2: *The Golden Goose*.

TECHNICAL DATA

Accession Number: C18751
Location: SPN8
Format: 16mm
Film Stock: Cellulose Nitrate
Edge Code: Unreadable
Type of Element: Composite Negative (Variable Area Soundtrack)
Notes: "Topolino n. 19" on film can and leader
Footage: 1 reel (ca. 60m)
Physical Conditions: Fair

FILMOGRAPHIC DATA:

Director: Unknown
Year: Unknown
Production: Unknown
Distribution: Official Films (16mm)
Series: Jungle Jinks Cartoons

The title *The Golden Goose* was most likely attributed by Official Films for the 16mm release of the film. I could not retrieve the original title; however, since Official Films had acquired the rights for the small gauge release of animated shorts from the Van Beuren studio, it is possible that *The Golden Goose* is one of them. One of the characters in the short looks suspiciously similar to Felix the Cat, although *The Golden Goose* is definitely not Felix' 1936 short *The Goose That Laid the Golden Eggs* (1936). It could be instead one of the *Aesop's Film Fables* inaugurated by Van Beuren studio in 1921 in collaboration with Paul Terry and closed in the 1930s. The soundtrack present on this copy does not necessarily mean that *The Golden Goose* was originally a sound film, as sound accompaniment could have been added later for the small gauge release. Since this copy is a negative, it is impossible to listen to the soundtrack on a flatbed viewer. The series *Jungle Jinks* was created by Official Films for the small gauge release of animation shorts.

The main issue with the copy is the presence of heavy sprocket marks. There is also light scratching and oil residue both on the film base and on the emulsion. The film stock is curled and shrunken. Some perforations are torn and one cement splice came apart. Despite these issues, the overall conditions of the copy are fair.

A LITTLE BIRD TOLD ME

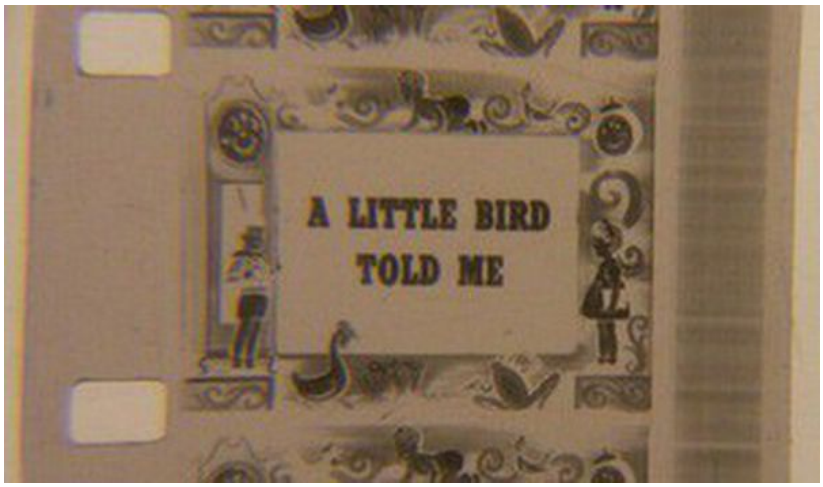

Figure 4.3: *A Little Bird Told Me*.

TECHNICAL DATA

Accession Number: C18752
Location: SPN8
Format: 16mm
Film Stock: Cellulose Nitrate
Type of Element: Composite Negative (variable density)
Edge Code: Unreadable
Notes: "Topolino n. 20" written on can and on film stock
Footage: 1 reel (ca. 80m)
Physical Conditions: Good

FILMOGRAPHIC DATA:

Director: Burt Gillett, James Tyer
Year: 1934
Production: Studio Van Beuren
Distribution: RKO (35mm distr.), Official Films (16mm distr.)
Series: Tiny Tot Cartoons

The title of the 16mm version of this film, released by Official Films, is the same that was used for the 1934 original theatrical distribution on the part of RKO. The short was produced by the Van Beuren studio, of which Official Films had the rights for small gauge reduction and distribution. It is an animation short with a live-action narrative frame. The opening credits have the title card "A Tiny Tot Cartoon," which might not have been present in the 35mm copy for theatrical distribution.

The copy present a few light scratches, slight warpage and some sprocket marks. Some torn perforations had been repaired using fragments of safety film stock – the repair has not been altered during inspection. The overall physical conditions of the copy are good.

LITTLE CHEEZER

Figure 4.4: *Little Cheezer*.

TECHNICAL DATA:

Accession Number: C18755
Location: SPN8
Format: 16mm
Film Stock: Cellulose Nitrate
Type of Element: Composite negative (variable area)
Edge Code: Ferrania
Notes: “Topolino n. 17” on film can and leader
Footage: 1 reel (ca. 60m)
Related copies: C18753 (16mm soundtrack-only negative); C18754 (16mm picture-only negative)
Physical Conditions: Good/Fair

FILMOGRAPHIC DATA:

Director: Rudolph Ising
Year: 1936
Production: Rudolf Isling, Metro Goldwin Mayer.
Distribution: Metro Goldwin Mayer (35mm), Pictorial Films (16mm)
Title of Theatrical Distribution: *Little Cheeser*

This animated short was originally distributed theatrically by MGM with the title *Little Cheeser*, which is also the name of the film's protagonist. The short was part of the series *Happy Harmonies*.[2] It was released on the small gauge market by Pictorial Film – the date of 16mm distribution could not be identified.

This copy is lightly scratched and has some sprocket marks. The film base is heavily shrunken and warped. The overall physical conditions are between good and fair.

2 Leonard Maltin, *Of Mice and Magic. A History of American Animated Cartoons* (New York: Plume, 1987), 441.

HOLLYWOOD MATADOR

Figure 4.5: *Hollywood Matador*.

TECHNICAL DATA:

Accession Number: C18756
Location: SPN8
Format: 16mm
Film Stock: Cellulose Nitrate
Type of Element: Composite Negative (variable density)
Edge Code: Ferrania
Notes: “Topolino n. 25” on film can and leader
Footage: 1 reel (ca. 60m)
Physical Conditions: Good

FILMOGRAPHIC DATA:

Director: Walter Lantz
Year: 1942
Production: Walter Lantz Productions
Distribution: Universal Pictures (35mm), Castle Films (16mm)

Hollywood Matador is an animation short with the character Woody Woodpecker, produced by Walter Lantz studio and released theatrically in Technicolor 35mm film by Universal in 1942. According to Scott MacGillivray's Castle Films, the short was released on the small gauge market in 1947, but the copyright notice on this copy reports the year 1948. The title was not change for 16mm distribution. On January 1, 1947 Castle Films was acquired by United World Films, Inc., the small gauge branch of Universal. The United logo in fact appears underneath Castle's in the end credits.

The copy does not present particular issues as regards its physical conditions, except for the usual shrinkage and some sprocket marks. Printed-through 16mm perforations are evident throughout the copy, which was evidently struck from a 16mm source.

TOYLAND ADVENTURE

Figure 4.6: *Toyland Adventure*.

TECHNICAL DATA:

Accession Number: C18761
Location: SPN8
Format: 16mm
Film Stock: Cellulose Nitrate
Type of Element: Composite Negative (variable area)
Edge Code: Unreadable
Notes: "Topolino n. 18" on film can and leader
Footage: 1 reel (ca. 60m)
Physical Conditions: Good

FILMOGRAPHIC DATA:

Director: Mannie Davis, John Foster
Year: 1931
Production: Van Beuren Studios
Distribution: RKO/Pathé Distributing Corp. (35mm), Official Films (16mm)
Title of Theatrical Distribution: *A Toyland Tale*
Series: Jungle Jinks Cartoons

This animated short was produced by the Van Beuren studio and released theatrically by RKO/Pathé in 1931 with the title *A Toyland Tale*. The 16mm release date is unknown.

The overall physical conditions of the copy are good There is only one splice and some sprocket marks, beside a fair degree of shrinkage. Some tape repairs on the source copy got printed through on this copy. The presence of such repairs suggests that the source was a release print.

SUNSHINE MAKERS

Figure 4.7: *Sunshine Makers*.

TECHNICAL DATA:

Accession Number: C18762
Location: SPN8
Format: 16mm
Film Stock: Cellulose Nitrate
Type of Element: Composite Negative (variable area)
Edge Code: Unreadable
Notes: “Topolino n. 16” on film can and leader
Footage: 1 reel (ca. 60m)
Physical Conditions: Good

FILMOGRAPHIC DATA:

Director: Ted Eshbaugh
Year: 1935
Production: Van Beuren Studios
Distribution: RKO (35mm), Official Films (16mm)

Sunshine Makers is an animation short originally distributed theatrically in Technicolor by RKO in 1935. Official Films did not change the title for the small gauge release, which was in black and white.

The copy is in good conditions. There is light scratching, especially on the film base, and some sprocket marks. The film stock is lightly shrunken and curled.

STRAY LAMB

Figure 4.8: *Stray Lamb*.

TECHNICAL DATA:

Accession Number: C18763
Location: SPN8
Format: 16mm
Film Stock: Cellulose Nitrate
Type of Element: Composite Negative (mono variable area)
Edge Code: Unreadable
Notes: “Topolino n. 15” on film can and leader
Footage: 1 reel (ca. 75m)
Related copies: C18764 (16mm composite positive print)
Physical Conditions: Fair

FILMOGRAPHIC DATA:

Director: Mervyn Freeman
Year: Unknown
Production: Unknown
Distribution: Official Films (16mm)

I could not retrieve the title *Stray Lamb* in any filmography, therefore I could not identify any information regarding its production and year of theatrical release. The name of the director was taken from the credits of the copy itself. *Stray Lamb* is a live-action short with animal characters.

The copy, in addition to being shrunken, has heavy sprocket marks between the perforations. Its overall physical conditions are fair. From this negative, a composite positive print was struck on Kodak film stock in 1964 – year obtained from the edge code.[3] The proof that this positive was struck from the negative in question is in the printed-through splices corresponding exactly to the cement splices on the negative. A note on the positive print reads: "Topolino per controtipo" ("Topolino for duplicate negative"). Apparently, the habit of calling any animation short (or, as in this case, any animation-inspired live-action film) a "Mickey Mouse" lasted for at least two decades. The presence of this print from 1964 also demonstrates that nitrate 16mm films were still handled long after they were manufactured.

3 Unlike Ferrania, Kodak used symbols to identify the year of manufacture of its film stock. In this case, the edge code reads: KODAK SAFE•TY FILM ■●, which indicates that the copy was manufactured in Kodak's French factory (indicated by the dot after the E in SAFETY) in 1964.

THREE LITTLE BRUINS MAKE MISCHIEF!

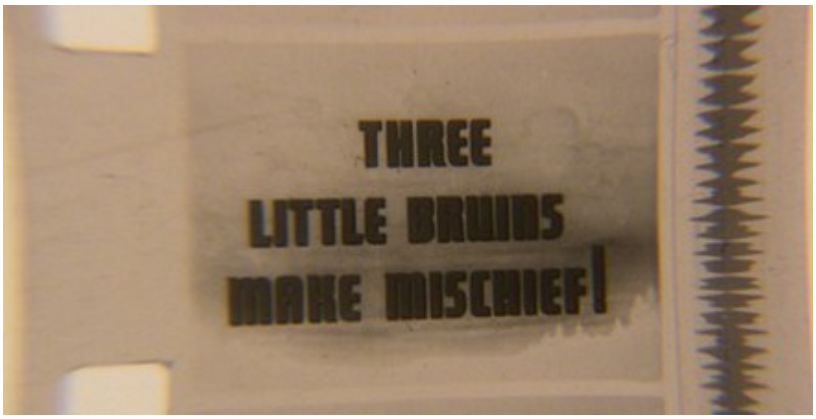

Figure 4.9: *Three Little Bruins Make Mischief!*

TECHNICAL DATA:

Accession Number: C18765
Location: SPN8
Format: 16mm
Film Stock: Cellulose Nitrate
Type of Element: Composite Negative (variable area)
Edge Code: Ferrania
Notes: "Topolino n. 14" on film can and leader
Footage: 1 reel (ca. 100m)
Physical Conditions: Good

FILMOGRAPHIC DATA:

Director: Unknown
Year: 1945 (copyright notice on the copy)
Production: Unknown
Distribution: Paramount (35mm), Castle Films (16mm)
Series: *The Adventure Parade*
Title of Theatrical Distribution: *Breezy Little Bears*

According to Scott MacGillivray's *Castle Films*, *Three Little Bruins Make Mischief!* was theatrically released by Paramount in 1940 with the title *Breezy Little Bears*.[4] Although the copyright notice on the copy reports the year 1945, MacGillivray lists 1946 as the date in which the film entered the 16mm market. The opening credits of the copy report *The Adventure Parade* as the series to which this short belongs, whereas MacGillivray lists this film under the *Three Little Bruins* series. Since there are several shorts starring the Three Little Bruins in the Castle Films catalog, it is possible that this short was released at different stages in different series. The opening credits also list Eugene W. Castle as the editor of this short, which suggests that the Castle Films release differs from the theatrical Paramount release.

The copy does not present any particular issues, and its physical conditions are overall good.

4 MacGillivray, *Castle Films*, 154.

MICKEY AND THE GIANT

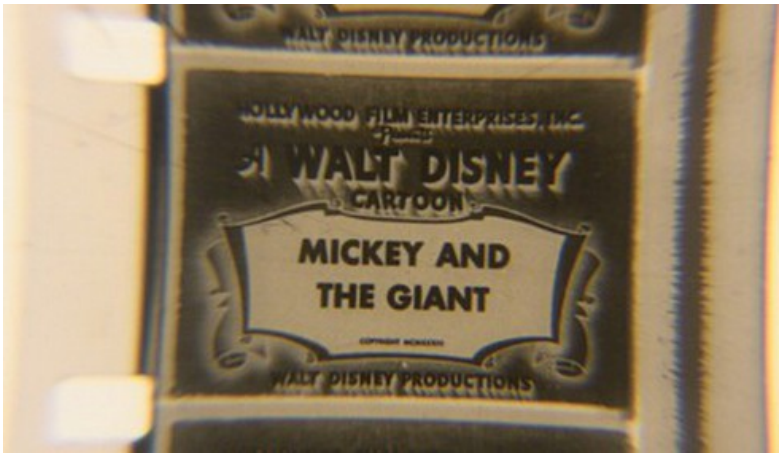

Figure 4.10: *Mickey and the Giant*.

TECHNICAL DATA:

Accession Number: C18771
Location: SPN8
Format: 16mm
Film Stock: Cellulose Nitrate
Type of Element: Composite Negative (variable area)
Edge Code: Ferrania ("The End" title card on safety Kodak stock)
Notes: "Topolino n. 5" on film can and leader; "Cannot be done anymore, discarded soundtrack" ("Non si può più fare, colonna scartata") on film can.
Footage: 1 reel (ca. 30m)
Physical Conditions: Fair

FILMOGRAPHIC DATA:

Director: Burt Gillett
Year: 1933
Production: Walt Disney Productions
Distribution: United Artists (35mm), Hollywood Film Enterprises, Inc. (16mm)
Title of Theatrical Distribution: *Giantland*

This animation short was produced by Disney and theatrically released in 1933 with the title *Giantland*; Hollywood Film Enterprises changed the title into *Mickey and the Giant* for the small gauge release, probably to emphasize the presence of Mickey Mouse. The short is inspired by the story of Jack and the Beanstalk.

The physical conditions of the copy are fair: there are scratches, especially on the film base, and sprocket marks. According to the notes handwritten on the film can, this copy could not be used for the print of the soundtrack and was discarded. The end credits are on 1964 Kodak safety film stock (the same used for the print of *Stray Lamb*). It is therefore likely that in 1964 San Paolo Film was re-releasing some of these shorts, and the attempt to print the soundtrack took place then.

MICKEY'S TRICK HORSE

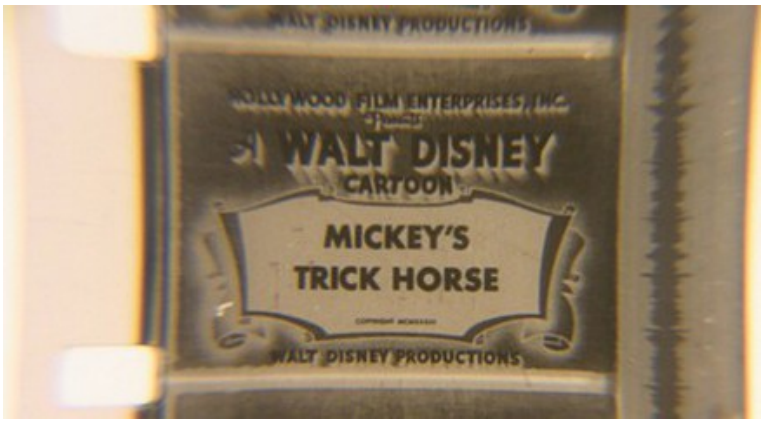

Figure 4.11: *Mickey's Trick Horse*.

TECHNICAL DATA:

Accession Number: C18773
Location: SPN8
Format: 16mm
Film Stock: Cellulose Nitrate
Type of Element: Composite Negative (variable area)
Edge Code: Ferrania
Notes: "Topolino n. 6" on film can and leader; "New soundtrack – good" ("Colonna nuova – buona") on film can.
Footage: 1 reel (ca. 30m)
Related Copies: C18772 (negative soundtrack only)
Physical Conditions: Fair/Good

FILMOGRAPHIC DATA:

Director: Burt Gillett
Year: 1933
Production: Walt Disney Productions
Distribution: United Artists (35mm), Hollywood Film Enterprises, Inc. (16mm)
Title of Theatrical Distribution: *The Steeplechase*

The title with which this Disney short was distributed theatrically in 1933 is *The Steeplechase.* Hollywood Film Enterprises changed the title in *Mickey's Trick Horse* for its small gauge release.

The physical conditions of the copy are between fair and good. There is some scratching, especially on the film base, and some sprocket marks.

MICKEY AND SIMON LEGREE

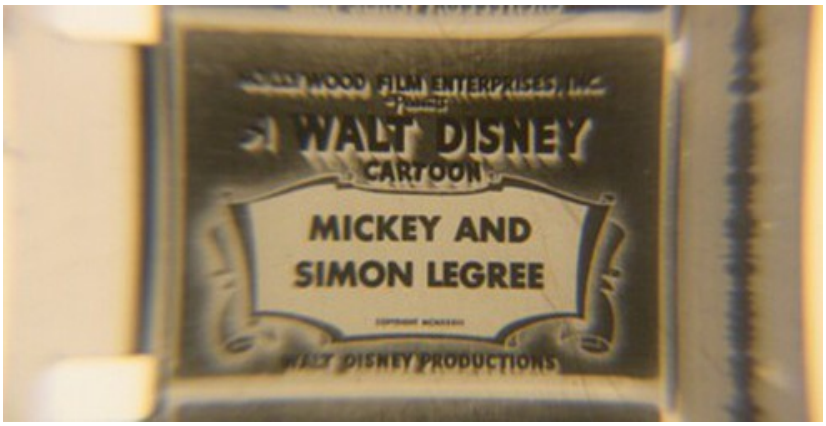

Figure 4.12: *Mickey and Simon Legree*.

TECHNICAL DATA:

Accession Number: C18779
Location: SPN8
Format: 16mm
Film Stock: Cellulose Nitrate
Type of Element: Composite Negative (variable area)
Edge Code: Ferrania
Footage: 1 reel (ca. 60m)
Related Copies: C18778 (positive print), C18780 (soundtrack-only negative), C18783 (picture-only negative)
Physical Conditions: Mediocre
N.B. The short *Peg Leg Pete the Pirate* is spliced in the same reel.

FILMOGRAPHIC DATA:

Director: Wilfred Jackson
Year: 1933
Production: Walt Disney Productions
Distribution: United Artists (35mm), Hollywood Film Enterprises, Inc. (16mm)
Title of Theatrical Distribution: *Mickey's Mellerdrammer*

The short *Peg Leg Pete the Pirate* is spliced to *Mickey and Simon Legree*: since the two shorts are in the same reel, they have the same accession number. The title of the theatrical distribution of *Mickey and Simon Legree* is *Mickey's Mellerdrammer*.

In the 1960s, a few copies were struck from this negative: a positive print (Kodak edge code, 1964), a picture-only negative (1965), and a soundtrack only negative (on Ferrania film stock, therefore impossible to date). The splices printed through on the more recent elements (excluding the soundtrack-only one) prove that they derive from this negative.

The copy presents heavy sprocket marks, as well as heavy shrinkage and warping. However, it is only lightly scratched. Its overall physical conditions are mediocre.

PEG LEG PETE THE PIRATE

Figure 4.13: *Peg Leg Pete the Pirate*.

TECHNICAL DATA:

Accession Number: C18779
Location: SPN8
Format: 16mm
Film Stock: Cellulose Nitrate
Type of Element: Composite Negative (variable density)
Edge Code: Ferrania
Footage: 1 reel (ca. 60m)
Related Copies: C18780 (soundtrack-only negative), C18781 (positive print), C18782 (picture-only negative)
Physical Conditions: Mediocre
N.B. The short *Mickey and Simon Legree* is spliced in the same reel.

FILMOGRAPHIC DATA:

Director: Frank Moser, Paul Terry
Year: 1935
Production: Terrytoons
Distribution: Castle Films (16mm)

See *Mickey and Simon Legree* for a description of this copy.

As with *Mickey and Simon Legree*, a few copies were struck from this negative: a positive print (1964) with a variable area soundtrack (unlike the one in this copy which is variable density); a picture-only negative (1965); and a soundtrack only negative (on Ferrania film stock, therefore impossible to date). The leader of the picture-only negative reports the handwritten note “8mm.”

MICKEY AND THE LILLIPUTIANS

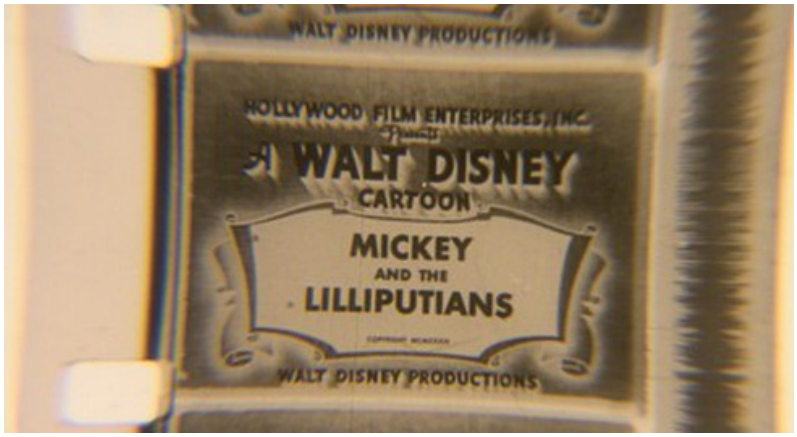

Figure 4.14: *Mickey and the Lilliputians*.

TECHNICAL DATA:

Accession Number: C18779
Location: SPN8
Format: 16mm
Film Stock: Cellulose Nitrate
Type of Element: Composite Negative (variable area)
Edge Code: Ferrania
Footage: 1 reel (ca. 30m)
Related Copies: C18785 (soundtrack-only negative)
Physical Conditions: Good

FILMOGRAPHIC DATA:

Director: Burt Gillett
Year: 1934
Production: Walt Disney Productions
Distribution: United Artists (35mm), Hollywood Film Enterprises, Inc. (16mm)
Title of Theatrical Distribution: *Gulliver Mickey*

Mickey and the Lilliputians was theatrically released in 1934 with the title *Gulliver Mickey*. The film stock is warped and shrunken, with some sprocket marks. One perforation is broken. The copy is only lightly scratched, except for a long and deep scratch on the emulsion side. Nonetheless, the overall physical conditions of the copy are good.

MICKEY SAVES THE AIRMAIL

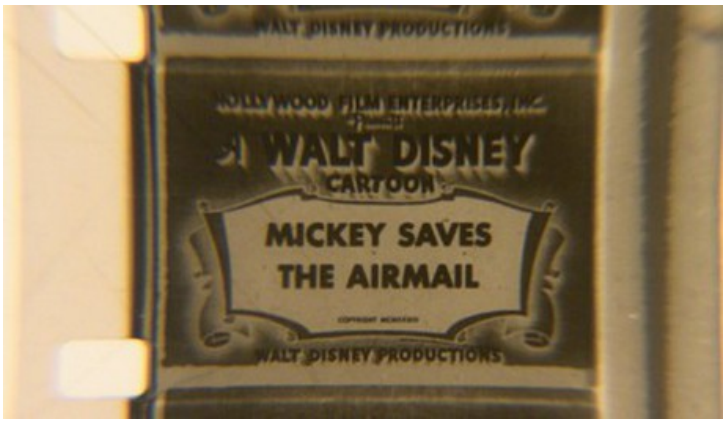

Figure 15.4: *Mickey Saves the Airmail*.

TECHNICAL DATA:

Accession Number: C18790
Location: SPN8
Format: 16mm
Film Stock: Cellulose Nitrate
Type of Element: Composite Negative (variable area)
Edge Code: Ferrania
Notes: "Topolino n. 1-2-3" on film can and leader.
Footage: 1 reel (ca. 150m)
Related Copies: C18789 (soundtrack-only positive)
Physical Conditions: Fair/Good
N.B. In the same reel with *Mickey's Exciting Picnic* and *Robinson Crusoe Mickey*.

FILMOGRAPHIC DATA:

Director: Dave Hand
Year: 1933
Production: Walt Disney Productions
Distribution: United Artists (35mm), Hollywood Film Enterprises, Inc. (16mm)
Title of Theatrical Distribution: *The Mail Pilot*

Mickey Saves the Airmail was distributed theatrically in 1933 with the title *The Mail Pilot*.

Three shorts are spliced together in one reel: *Mickey Saves the Airmail, Mickey's Exciting Picnic* and *Robinson Crusoe Mickey*. For this reason, they have the same accession number. The reel has three splices and four torn perforations. There are scratches on the film base and sprocket marks. The physical conditions are overall between fair and good. A positive soundtrack-only reel was struck from this negative: since it is on Ferrania film stock, it is impossible to date it.

MICKEY'S EXCITING PICNIC

Figure 4.16: *Mickey's Exciting Picnic*.

TECHNICAL DATA:

Accession Number: C18790
Location: SPN8
Format: 16mm
Film Stock: Cellulose Nitrate
Type of Element: Composite Negative (variable area)
Edge Code: Ferrania
Notes: "Topolino n. 1-2-3" on film can and leader
Footage: 1 reel (ca. 150m)
Related Copies: C18789 (soundtrack-only negative), C18769 (picture-only negative), C18770 (positive print)
Physical Conditions: Fair/Good
N.B. In the same reel with *Mickey Saves the Airmail* and *Robinson Crusoe Mickey*.

FILMOGRAPHIC DATA:

Director: Dave Hand
Year: 1934
Production: Walt Disney Productions
Distribution: United Artists (35mm), Hollywood Film Enterprises, Inc. (16mm)
Title of Theatrical Distribution: *Camping Out*

See *Mickey Saves the Airmail*. *Mickey's Exciting Picnic* was theatrically distributed in 1934 with the title *Camping Out*.

ROBINSON CRUSOE MICKEY

Figure 4.17: *Robinson Crusoe Mickey*.

TECHNICAL DATA:

Accession Number: C18790
Location: SPN8
Format: 16mm
Film Stock: Cellulose Nitrate
Type of Element: Composite Negative (variable area)
Edge Code: Ferrania
Notes: "Topolino n. 1-2-3" on film can and leader
Footage: 1 reel (ca. 150m)
Related Copies: C18789 (soundtrack-only negative)
Physical Conditions: Fair/Good
N.B. In the same reel with *Mickey Saves the Airmail* and *Mickey's Exciting Picnic*.

FILMOGRAPHIC DATA:

Director: Dave Hand
Year: 1935
Production: Walt Disney Productions
Distribution: United Artists (35mm), Hollywood Film Enterprises, Inc. (16mm)
Title of Theatrical Distribution: *Mickey's Man Friday*

See *Mickey Saves the Airmail*. Robinson Crusoe Mickey was theatrically distributed in 1935 with the title *Mickey's Man Friday*.

ROBIN HOOD RIDES AGAIN

Figure 4.18: *Robin Hood Rides Again*.

TECHNICAL DATA:

Accession Number: C18876
Location: SPN8
Format: 16mm
Film Stock: Cellulose Nitrate
Type of Element: Composite Negative (variable area)
Edge Code: Ferrania
Notes: "Topolino n. 57 - 54" on film can and leader
Footage: 1 reel (ca. 130m)
Physical Conditions: Good
N.B. In the same reel with *Happy Hoboes*.

FILMOGRAPHIC DATA:

Director: George Stallings
Year: 1934
Production: Van Beuren Studios
Distribution: Official Films (16mm)
Series: Brownie Bear (re-release)
Title of Theatrical Distribution: *Goode Knight*

The short opens with the title card “A Brownie Bear Cartoon”: Brownie Bear was the name given by Official Films to Cubby Bear, a Van Beuren character, for the re-release of the animation shorts in which it starred. *Robin Hood Rides Again* was theatrically released in 1934 with the title *Goode Knight*.

Robin Hood Rides Again is spliced together with *Happy Hoboes* in one reel: the two shorts therefore have the same accession number. The physical conditions of the reel are good, presenting only light warping.

HAPPY HOBOES

Figure 4.19: *Happy Hoboes*.

TECHNICAL DATA:

Accession Number: C18876
Location: SPN8
Format: 16mm
Film Stock: Cellulose Nitrate
Type of Element: Composite Negative (variable area)
Edge Code: Ferrania
Notes: "Topolino n. 57 - 54" on can and leader
Footage: 1 reel (ca. 130m)
Physical Conditions: Good
N.B. In the same reel with *Robin Hood Rides Again*.

FILMOGRAPHIC DATA:

Director: George Rufle, Vernon Stallings
Year: 1933
Production: Van Beuren Studios
Distribution: RKO Radio Pictures (35mm), Official Films (16mm)
Series: Dick and Larry (re-release)

See *Robin Hood Rides Again*. This short opens with the title card “A Dick and Larry Cartoon”. Dick and Larry are two Van Bueren characters whose original name was Tom and Jerry. Because of the success of the more famous Warner Brothers’ Tom and Jerry, their name were changed for the re-release of their shorts. The title of this short was not changed for the small gauge release.

LE AVVENTURE DI PINOCCHIO/1

Figure 4.20: *Le avventure di Pinocchio* – picture only.

TECHNICAL DATA:

Accession Number: C20173
Location: SPN8
Format: 16mm
Film Stock: Cellulose Nitrate
Type of Element: Negative (picture-only)
Edge Code: Ferrania
Footage: 6 reels (ca. 970m)
Related Copies: C20172 (soundtrack-only negative)
Physical Conditions: Good

FILMOGRAPHIC DATA:

Country: Italy
Director: Gianni Guardone
Year: 1947
Production: Excelsa Film, Fiaba Film
Distribution: Minerva Film (35mm), R.E.F. (1949, 16mm)

This copy is the complete picture-only negative of *Le avventure di Pinocchio*, Italian feature film directed by Gianni Guardone and casting Alessandro Tommei, Mariella Lotti, and Vittorio Gassman. It was released theatrically in 1947, and first appeared in R.E.F. catalogs in 1949. The print sheets accompanying the copy are also dated 1949.

The overall physical conditions of this copy are good. There is only light scratching on the film base and emulsion, and three splices in the sixth reel.

LE AVVENTURE DI PINOCCHIO/2

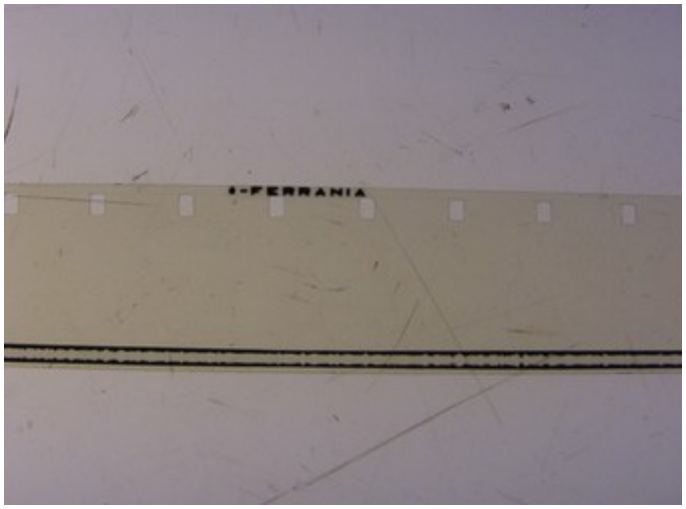

Figure 4.21: *Le avventure di Pinocchio* – soundtrack-only.

TECHNICAL DATA:

Accession Number: C20172
Location: SPN8
Format: 16mm
Film Stock: Cellulose Nitrate
Type of Element: Negative (soundtrack-only, variable area)
Edge Code: Ferrania
Footage: 6 reels (ca. 970m)
Related Copies: C20173 (picture-only negative)
Physical Conditions: Good

FILMOGRAPHIC DATA:

See *LE AVVENTURE DI PINOCCHIO/1*

See *Le avventure di Pinocchio*/1.

The copy is overall in good conditions, with only slight curling and warping of the film stock.

IDILLIO A BUDAPEST

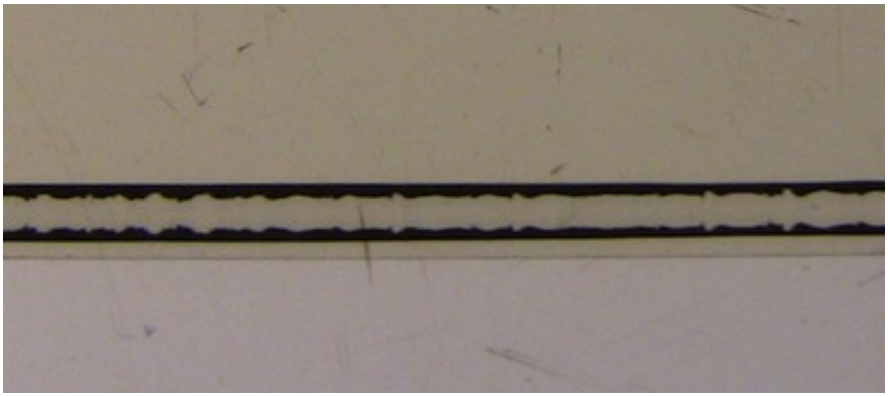

Figure 4.22: *Idillio a Budapest*.

TECHNICAL DATA:

Accession Number: C21054
Location: SPN8
Format: 16mm
Film Stock: Cellulose Nitrate
Type of Element: Negative (soundtrack-only)
Edge Code: Ferrania
Footage: 8 reels (ca. 770m)
Physical Conditions: Mediocre

FILMOGRAPHIC DATA:

Country: Italy
Director: Giorgio Ansoldi, Gabriele Varriale
Year: 1941
Production: Schermi del mondo
Distribution: Cine Tirrenia (35mm), R.E.F. (1947, 16mm)

Only the soundtrack for this title is conserved in the San Paolo Film collection. *Idillio a Budapest* is part of the first group of feature films distributed by R.E.F. in 1947. It is an adaptation of the opera *Un duca e forse una duchessa* by Santiago Salvich.

The physical conditions of the copy are mediocre. There is heavy shrinkage, a fair amount of scratching, warping, and dirt. Towards the end of the sixth reel, the emulsion is peeling. The leader spliced to the copy was on acetate stock, with a high level of acetic syndrome. It was replaced with polyester leader.

LA CODA DEL DIAVOLO/1

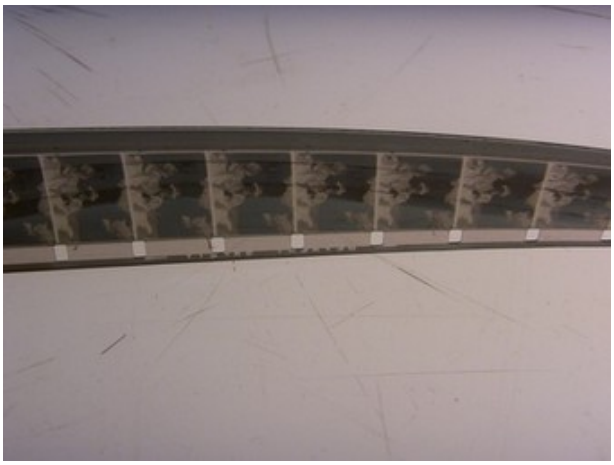

Figure 4.23: *La coda del diavolo*.

TECHNICAL DATA:

Accession Number: C21072
Location: SPN8
Format: 16mm
Film Stock: Cellulose Nitrate
Type of Element: Composite Negative (variable area)
Edge Code: Ferrania
Footage: 4 rulli (ca. 650m)
Related Copies: C21073 (soundtrack-only negative), C21074 (trailer; composite negative, variable area), C21075 (trailer; soundtrack-only negative)
Physical Conditions: Fair/Mediocre

FILMOGRAPHIC DATA:

Country: Sweden
Original Title: *Pengar – En Tragikomisk Saga*
Director: Nils Pope
Year: 1946
Production: Fribergs Filmbyrå AB
Distribution (Italy): Roma Film (35mm), San Paolo Film (16mm)

Pengar – En Tragikomisk Saga was theatrically released in 1946, and was distributed in Italy with the title *La coda del diavolo* presumably after 1947, year in which it was in competition at the Venice Film Festival. As regards the small gauge release of the film, La coda del diavolo does not appear in the San Paolo Film catalogs until 1959. Since the negative is presumably from the end of the 1940s, and the print sheet that accompanies the negative is dated 1956, it is likely that the 16mm release of this film was postponed for unknown reasons.

Pengar is the first film directed by Nils Pope, a Swedish comedian who would then work with Ingmar Bergman. Pope is both director and protagonist of this film. The copy in the San Paolo Film collection is dubbed, as testified by the opening credits. The presence of the Roma Film logo confirms that R.E.F. had bought the Italian version of the film.

This copy was struck from a Gevaert safety positive, as testified by the printed-through edge code. The conditions of this copy are between fair and good. In addition to dirt, scratches, and warping, this copy has a silver mirroring issue.[5]

5 Silver mirroring is the effect of a chemical process affecting silver-based emulsions. With time, the silver decays and silver ions travel to the surface of the emulsion, giving the image a metallic sheen, especially in the darker areas.

LA CODA DEL DIAVOLO/2

Figure 4.24: *La coda del diavolo*'s original film can.

TECHNICAL DATA:

Accession Number: C21073
Location: SPN8
Format: 16mm
Film Stock: Cellulose Nitrate
Type of Element: Negative (soundtrack-only, variable area)
Edge Code: Ferrania
Footage: 4 reels (ca. 650m)
Related Copies: C21072 (composite negative), C21074 (trailer; composite negative), C21075 (trailer; soundtrack-only negative)
Physical Conditions: Fair/Mediocre

FILMOGRAPHIC DATA:

See *LA CODA DEL DIAVOLO*/1

See *La coda del diavolo*/1.

This copy's physical conditions are between fair and mediocre because of dirt, scratches, curling, waving, and traces of mold.

LA CODA DEL DIAVOLO/3

Figure 4.25: *La coda del diavolo* – trailer.

TECHNICAL DATA:

Accession Number: C21074
Location: SPN8
Format: 16mm
Film Stock: Cellulose Nitrate
Type of Element: Composite Negative (variable area)
Edge Code: Ferrania
Footage: 1 reel (ca. 30m)
Related Copies: C21072 (composite negative), C21073 (soundtrack-only negative), C21075 (trailer; soundtrack-only negative)
Physical Conditions: Fair/Mediocre
N.B. *La coda del diavolo*'s trailer.

FILMOGRAPHIC DATA:

See *LA CODA DEL DIAVOLO*/1

This is a negative copy of the trailer for *La coda del diavolo*. The title cards not only suggest that the film was successful in Italy, but also confirm the hypothesis that the 16mm release was postponed by R.E.F. for unknown reasons. Nils Pope is defined as "the new darling of all audiences," and there is a reference to an award won at the Venice Film Festival. In addition to this, *La coda del diavolo* is advertised as "the greatest comic success of the season." Since *La coda del diavolo* was released theatrically in Italy around 1947, which is the year in which it won an award in Venice, the phrasing of the trailer's advertisement suggests that both the trailer and the feature were reduced onto 16m concurrently with the theatrical release, even though the film was not distributed in the small gauge market until 1959, year in which *La coda del diavolo* is listed for the first time in San Paolo Film's catalogs.

This physical conditions of this copy are between fair and mediocre. It presents dirt, scratches, curling, and waving, in addition to the silver mirroring that is present on the feature as well.

LA CODA DEL DIAVOLO/4

TECHNICAL DATA:

Accession Number: C21075
Location: SPN8
Format: 16mm
Film Stock: Cellulose Nitrate
Type of Element: Negative (soundtrack-only, variable area)
Edge Code: Ferrania
Footage: 1 reel (ca. 30m)
Related Copies: C21072 (composite negative), C21073 (soundtrack-only negative), C21074 (trailer; composite negative)
Physical Conditions: Fair
N.B. *La coda del diavolo*'s trailer.

FILMOGRAPHIC DATA:

See *LA CODA DEL DIAVOLO*/1

See *La coda del diavolo/1*.

The physical conditions of this copy are overall fair. There are slight dirt and scratches, and some mold. The main issues are warping, curling, and shrinkage.

LE NUOVE AVVENTURE DI TARZAN

Figure 4.26: *Le nuove avventure di Tarzan*.

TECHNICAL DATA:

Accession Number: C21312
Location: SPN8
Format: 16mm
Film Stock: Cellulose Nitrate
Type of Element: Negative (picture-only)
Edge Code: Unreadable
Footage: 4 reels (ca. 500m)
Related Copies: C21313 (soundtrack-only negative)
Physical Conditions: Fair

FILMOGRAPHIC DATA:

Country: U.S.
Original Title: *The New Adventures of Tarzan*
Director: Edward Kull, Wilbur McGaugh
Year: 1935
Production: Burrough-Tarzan Enterprises, Inc.
Distribution: R.E.F. (16mm)

Le nuove avventure di Tarzan was theatrically distributed in the United States as a twelve-episode serial, for an overall length of 251 minutes. Evidently, this copy is an abridged version of the original film. There is no information available about an Italian theatrical distribution of this title, except for R.E.F.'s small gauge release. Burrough-Tarzan Enterprises, Inc., which produced *The New Adventures of Tarzan*, also produced *Tarzan and the Green Goddess* (Italian title: *Tarzan e la Dea Verde*), which is also in the R.E.F. catalog.

This copy is in fair physical conditions. There is some dirt, and the fourth reel has traces of mold. There is also light scratching and warping. The fourth reel has a few torn perforations.

I CAVALIERI DELLA NOTTE/1

Figure 4.27: *I cavalieri della notte* – picture-only.

TECHNICAL DATA:

Accession Number: C21491
Location: SPN8
Format: 16mm
Film Stock: Cellulose Nitrate
Type of Element: Negative (picture-only)
Edge Code: Unreadable
Footage: 2 reels (ca. 510m)
Related Copies: C21492 (soundtrack-only negative)
Physical Conditions: Fair/Mediocre

FILMOGRAPHIC DATA:

Country: U.S.
Original Title: *Riders of the Dawn*
Director: Robert N. Bradbury
Year: 1937
Production: Monogram Pictures
Distribution: Minerva Film (Italy, 35mm), R.E.F (16mm)

The filmographic data were obtained by cross-referencing the information on the copy with American filmographies, since the title *I cavalieri della notte* does not appear in any Italian filmography. This copy, which opens with the logo of Minerva Film, is apparently the only evidence of the Italian distribution of this feature film. *I cavalieri della notte* (Riders of the Dawn, 1937) is a western directed by Robert N. Bradbury for Monogram Pictures. The print sheet was found together with the copy, and reports the year 1947. The heading on the print sheet is that of the La Positiva lab in Torino, Italy.

This copy's physical conditions are between fair and mediocre. There are light traces of dirt, but numerous scratches, especially on the film base. The film stock is warped and shrunken.

I CAVALIERI DELLA NOTTE/2

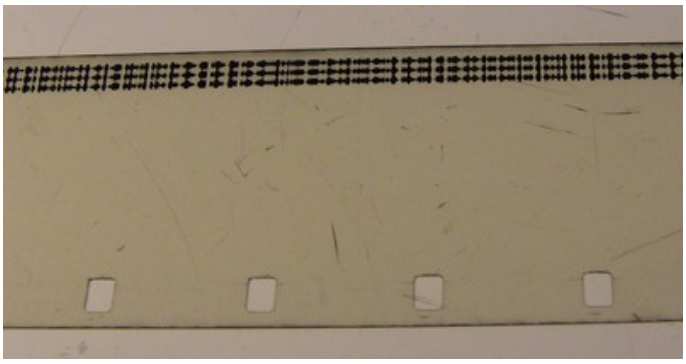

Figure 4.28: *I cavalieri della notte* – soundtrack-only.

TECHNICAL DATA:

Accession Number: C21492
Location: SPN8
Format: 16mm
Film Stock: Cellulose Nitrate
Type of Element: Negative (sounstrack-only)
Edge Code: Ferrania
Footage: 2 reels (ca. 510m)
Related Copies: C21491 (picture-only negative)
Physical Conditions: Fair/Mediocre

FILMOGRAPHIC DATA:

See *I CAVALIERI DELLA NOTTE*/1

See *I CAVALIERI DELLA NOTTE*/1.

The soundtrack on this negative is a Maurer multiple variable area track. It is the only soundtrack of this kind that I have seen in the San Paolo Film collection. Some details about Maurer soundtracks can be found in Howard M. Tremaine's *Audio Cyclopedia*:

> In Multiple Variable-area sound-track recording, six or more identical bilateral sound tracks are recorded side by side. Such sound tracks are generally used with 16-mm photographic sound recording. The advantages claimed for this method of recording are that because the tracks are quite narrow, distortion caused by azimuth deviation and uneven slit illumination is considerably reduced, and the signal-to-noise ratio is increased. This type sound track is used by Maurer, and the German Tobias-Klang-film Co. A method of recording 13 sound tracks, developed by Siemens-Halske, also of Germany, has been described in the literature.[6]

The physical conditions of this copy are between fair and mediocre. There are traces of dirt, scratches, and sprocket marks. The film stock is torn in a few spots, and there are a few torn perforations.

6 Howard M. Tremaine, *Audio Cyclopedia* (H. W. Sams, 1969), 915; cited in http://www.paulivester.com/films/filmstock/guide.htm, accessed May 30, 2017.

PORCA L'OCA... CHE PAURA!

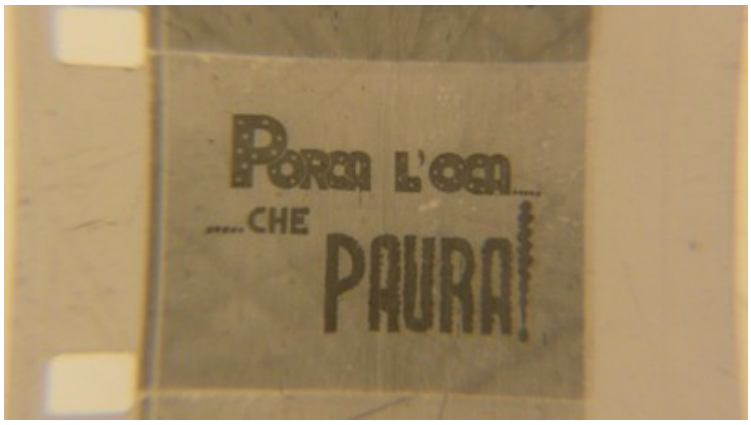

Figure 4.29: *Porca l'oca… che paura!*

TECHNICAL DATA:

Accession Number: C21673
Location: SPN8
Format: 16mm
Film Stock: Cellulose Nitrate
Type of Element: Negative (picture-only)
Edge Code: Unreadable
Footage: 1 reel (ca. 150m)
Related Copies: from C21668 to C21676
Physical Conditions: Good/Fair

FILMOGRAPHIC DATA:

Country: Unknown
Director: Unknown
Year: Unknown
Production: Unknown
Distribution: R.E.F. (16mm)

It was impossible to obtain any filmographic data about this short. One of the opening title cards reports the names “Pick e Puck.” Even though these names appear in the opening credits of several copies in the San Paolo Film collection, I could not find any information related to them.

The physical conditions of the copy are between good and fair. The main issues are the presence of sprocket marks and heavy warping.

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Variety

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