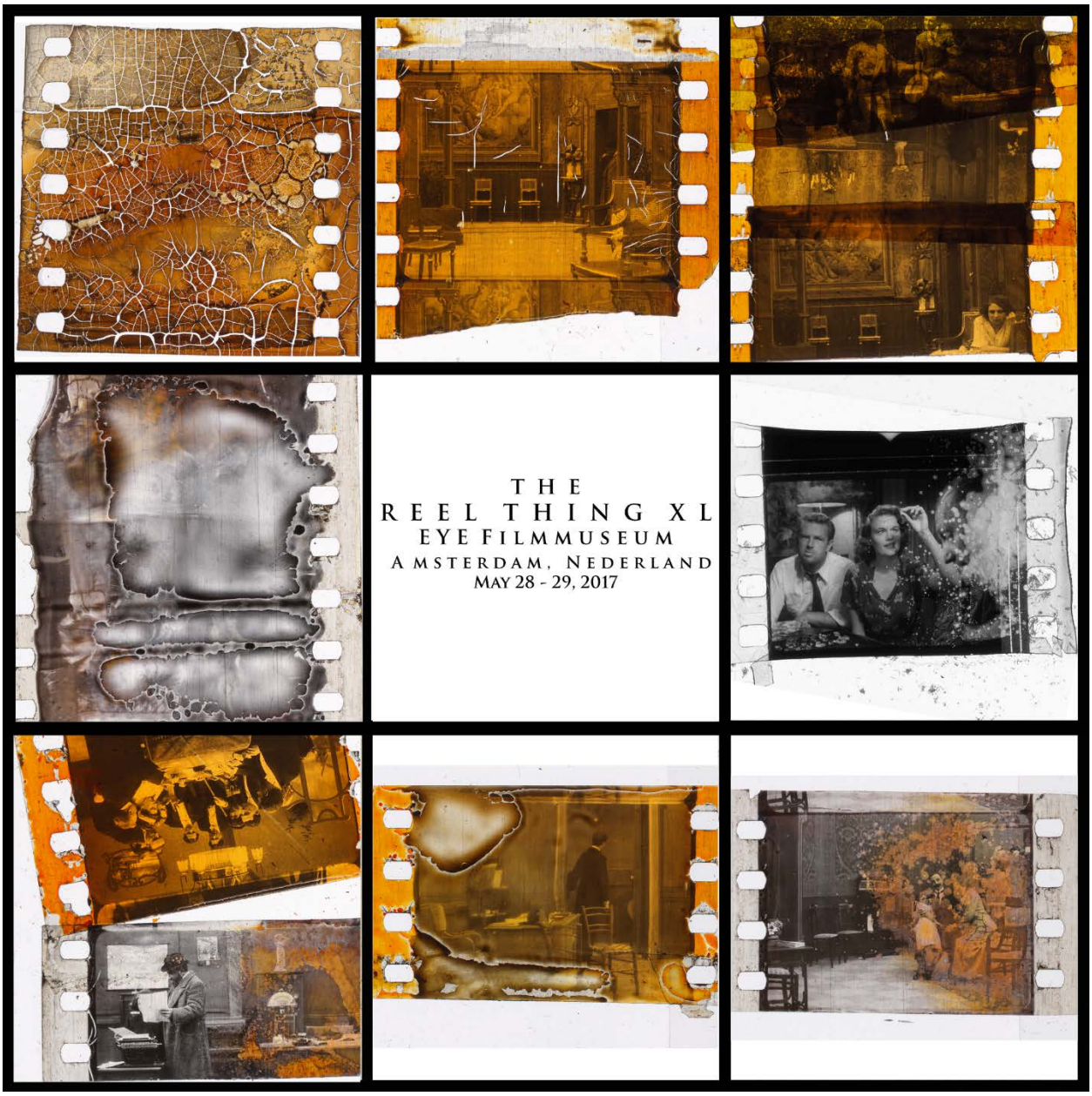
THE
REEL THING XL
EYE FILMMUSEUM
AMSTERDAM, NEDERLAND
MAY 28 - 29, 2017

No enterprise in the non-profit world can accomplish much without the enlightened, altruistic cooperation of its benefactors. The Reel Thing has been privileged to enjoy the generous support of the professional community since its inception. The organizers of The Reel Thing would like to recognize and thank all the individuals and organizations who contributed their considerable skills, energy and enthusiasm to the symposium. As always, we thank our presenters, who share their knowledge and experience in this symposium. And we would like to recognize the following individuals for their support and collaboration:

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The Reel Thing is made possible by the active and engaged support of some of the most important and innovative institutions in the archival field. These firms work side by side with scholars, archivists and asset managers to compile and disseminate information critical to the archival mission, raise the standard of preservation and restoration, and to find new ways to ensure that moving images from public collections and the private sector will retain their quality and remain accessible as a resource for future generations. We offer our gratitude for their indispensable support of The Reel Thing.

Amsterdam University Press Universiteit van Amsterdam AMIA Haghefilm Digitaal

T H E

R E E L T H I N G XL

EYE Filmmuseum - Amsterdam, Nederland
Sunday, May 28 - Monday, May 29, 2017

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Sunday

Film Restoration Using Classical Conservation/Restoration Tools and Techniques
Ulrich Ruedel, University of Applied Science Berlin and Anke Mebold, Deutsches Filminstitut, Wiesbaden

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Restoring Fritz Lang's *Der Müde Tod* (*Destiny*, 1921)
Anke Wilkening, Friedrich-Wilhelm-Murnau-Stiftung

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Dick Higgins' *For the Dead* (1965): Challenges of Preserving a Möbius Strip Loop Film
Kristof Efferenn, Kunsthochschule für Medien Köln and Arnaud Obermann, Staatsgalerie Stuttgart

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B R E A K

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HDR Grading Applied to Film Heritage
Audrey Birrien, Éclair

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Preservation Metadata for DPX
Marjolein Steeman and Josefien Schuurman, Netherlands Institute for Sound and Vision

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The Restoration of Camille de Morihon's *Le fer á cheval* (1909)
Marcello Seregni, Fondazione Cineteca Italiana and Alice Rispoli, Cineteca di Friuli
Associazione Culturale Hommelette (Trieste)

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B R E A K

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Building a Flexible, High Resolution Scanner for Legacy Film Capture
Daniel Borenstein, Centre national du cinéma et de l'image animée, Bois d'Arcy
and Chris Hall, Filmlight Ltd., United Kingdom

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Preserving Imperfection - Ethics and Pragmatism in Digital Preservation
Tone Føreland, National Library of Norway

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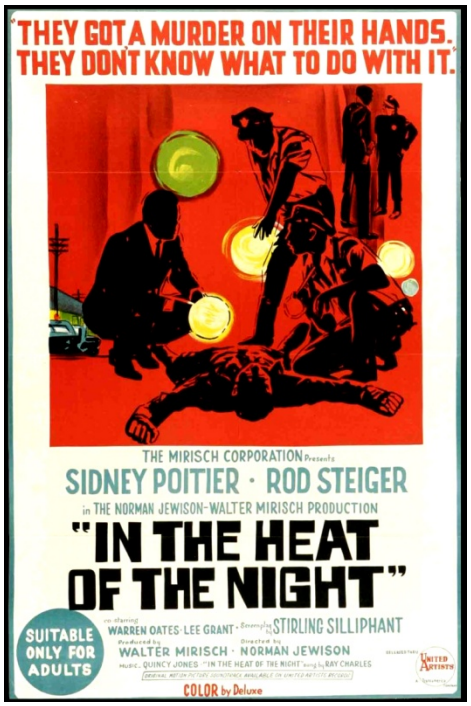

Sunday, May 28
EYE will present a screening of the newly restored Academy Award Best Picture winner, *In the Heat of the Night*

Monday

Innovating Analogue Lab Techniques for Use in the digital age
Gerard de Haan, Haghefilm Digital

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Restoring Ula Stockl's *Neun Leben Hat Die Katze* (*The Cat Has Nine Lives*, 1968)
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Traditional Photochemical Printing - Sharing Laboratory Techniques
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B R E A K

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Preservation and Accessibility of Digital Born and Digitized Film
Jeroen de Mol and Annegien Schrier, EYE Filmmuseum, Amsterdam

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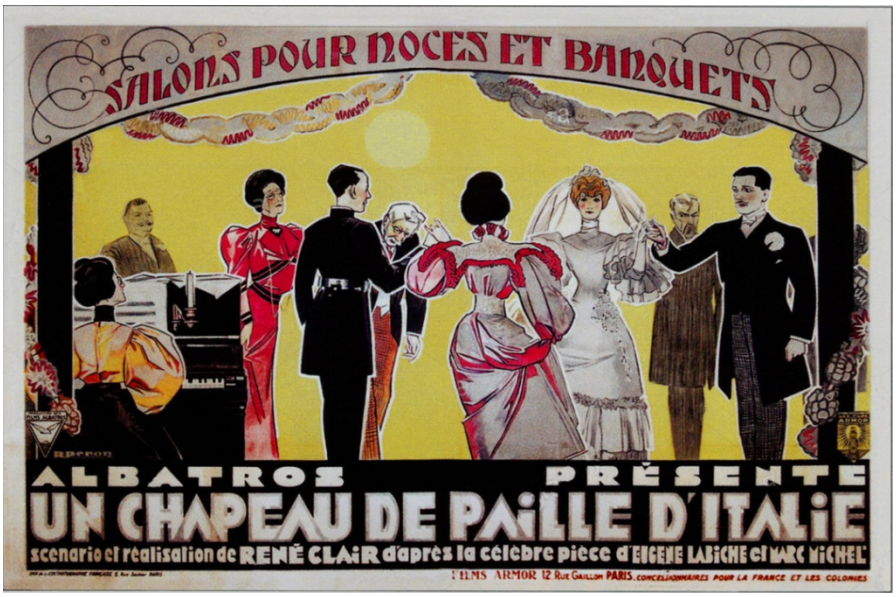
The REMI Project - Handmade Emulsion Primitive Colour
Esther Urlus, WORM Filmwerkplaats



Monday, May 29
EYE will present a screening of the restored René Clair comedy *Un Chapeau de paille d'Italie*

P R O G R A M

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Film Restoration Using Classical Conservation/Restoration Tools and Techniques

Ulrich Ruedel, University of Applied Science Berlin and Anke Mebold, Deutsches Filminstitut, Wiesbaden

At the University of Applied Sciences (HTW Berlin), moving image restoration is taught and pursued alongside more 'classical' fields such as the conservation of photography and the general field of conservation and restoration of archeological objects, modern materials and industrial heritage. In this curriculum, hands-on work and analytical-chemical approaches to conservation and restoration in the moving image field are practiced and taught.

A joint project between DIF and HTW involved treatment of an original nitrate print of the silent film *Der Kampf ums Matterhorn* (1928). A vintage nitrate print had been retouched using certain chemical applications that over time have proven to be deleterious. In the course of the project, chemical investigations of the retouched layers were performed in support of a painstaking, frame-by-frame process of manual removal with solvents. This process is similar to practices employed in the conservation of painting or photography than those common in film restoration. Infrared spectroscopy provided important insight into the nature of the retouching material. X-Ray Fluorescence spectroscopy (XRF) and classical visual microscopy elucidated the chemistry used in early applied color, and in unusual natural color systems such as the Sirius process. This workshop demonstrated the importance of combining traditional skill-based handling and interpretation of the film with the insights provided by more rigorously prescribed methods of chemical, optical and material analysis.

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Restoring Fritz Lang's *Der Müde Tod* (*Destiny*, 1921)

Anke Wilkening, Friedrich-Wilhelm-Murnau-Stiftung

Der Müde Tod is one of Fritz Lang's masterpieces from the Weimar period, and yet it is a lost film in some respect. Although the storyline is intact, significant aspects of the aethetic concept of the film did not survive. All existing prints are black-and-white; the colours produced by tinting are missing.

In 1921, defining the scenes as day or night was a post-production or film laboratory task. Most outdoor night scenes were filmed during the day and thus appear as bright as day in the positives made from the negatives. Tinting the black-and-white positives blue turned them into night scenes. The black-and-white prints provide a distorted view of the movie, because the night scenes are not visually distinguished from the day scenes.

As no vintage print from the 1920s has survived, the colours used to create a restored version were simulated based on the model of films produced by Decla during the same period. Already in the 1990s, when Desmet Colour became a solution for producing colour prints from black-and-white negatives,
the idea to create a colour map for *Der Müde Tod* arose. But this restoration was never done. Most likely
the necessary trial-and-error printing required to create a colour map from scratch made such a project appear unattainable. In contrast, digital colour correction provides an ideal technical environment for experimenting with different colour maps as well as reproducing chemical tints' specific colour tones which are independent from the photographic image. This digital approach is making it possible not only to restore temporal intelligibility to the narrative, but also to provide the affective dimension produced by colour in the viewing experience.

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Dick Higgins' *For the Dead* (1965): Challenges of Preserving a Möbius Strip Loop Film

Kristof Efferenn, Kunsthochschule für Medien Köln and Arnaud Obermann, Staatsgalerie Stuttgart

Dick Higgins was a student of John Cage at the New School for Social Research, an early Fluxus artist, founder of the Something Else Press, and creator of several astonishing 16mm films in the 1960s. He is most known for participating in the Fluxfilm Anthology (1962-1970), compiled by George Maciunas. Higgins also coined the term 'Intermedia' in an influential essay in 1966, where he wrote about fusing the boundaries of art forms with new media. The year before, Higgins completed *For the Dead* (1965) where he demonstrably experimented with the immanent characteristics of photochemical film.

Since 1981, *For the Dead* and two other films by the artist have resided in the collection of the Staatsgalerie in Stuttgart, Germany. Given to the collector Hanns Sohm as a gift from Higgins in 1969, the films have not been presented for nearly 35 years. Based on the presumption that *For the Dead* is a regular, chronological 16mm film, persons involved were surprised to read in Higgins' notes about his artwork: "One film which was missing [...] is my second film loop film, *For the Dead* (1965) [...] It was photographed on Kodachrome at Provincetown, and is a very long Moebius Strip."

This presentation will focus on the case of *For the Dead* in order to highlight the challenges of restoring non-standard films created by independent filmmakers whose work explored materialist aspects of the medium. A particularly important dimension of this work is the cycle of research necessary to uncover the true characteristics of the original film experience, and to produce an authentic representation of these works in the media currently available to the restorationist.

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B R E A K

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HDR Grading Applied to Film Heritage

Audrey Birrien, Éclair

It is clear that the mediasphere that includes technologies for cinema, home and mobile viewing, is rapidly moving towards displays which are designed to deliver a High Dynamic Range image. Contemporary and legacy systems (including film projection) are rapidly giving way to new methods for presenting images to spectators, and increasingly fewer members of the moving image audience will have access to the legacy systems of image presentation. Éclair has conducted tests of HDR (High Dynamic Range) grading and its impact on film heritage. HDR brings up various technical, artistic and ethical questions that apply to all types of imaging - color, black-and-white, and even the processes of the earliest decades of cinema such as tinting, toning and hand-coloring. The HDR system makes it possible to reproduce more range and color, and more subtlety in color, than has heretofore been possible. For a long time, the technical problem was to modulate the color of cinema in order to fit the more limited capability of reproduction systems like video. Today, HDR actually provides more space than the range of historical color in motion pictures. Thus, the question arises as to how to digitally preserve historically accurate color extracted from legacy media, and how to effectively delimit this color in a context where current technology begins to approximate the optical range of the human eye. As production techniques deploy HDR, new display devices and HDR content condition the viewer's cognitive expectations with respect to color in a way that decenters and denaturalizes the experience of historical color.

Experience with HDR at Éclair suggests the importance of a thorough-going review of the key steps of restoration. This entails the introduction of critical questions regarding calibration and the technical

specifications of the scanned frame, texture (grain) management, grading, the technical and subjective processes of emulation within a new and enlarged color space, and the integration of sections which have been subject to digital restoration techniques. Significant questions arise: how - in terms of technical practice - can we respect the artistic achievement, and how can we establish normative limits for legacy films presented in a world of wider and more refined color? What is the role and the point of view of the director of photography and the director - how should their perspectives be characterized and integrated into the process? And then, how do we mediate between the requirements of conservation and the demands from distribution? As we contemplate these critical questions for the cultural legacy of the cinema, is it too soon to ask what we should be doing to make it possible to retain the values of contemporary production when the next technical transformation of imaging introduces a new paradigm? These questions are among the most significant that we - manufacturers, film-makers, laboratories, distributors, archives, scholars and audiences - are faced with today.

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Preservation Metadata for DPX

Marjolein Steeman and Josefien Schuurman, Netherlands Institute for Sound and Vision

The only way we will be able to save our contemporary media and our cinematic legacy is by digital means. And the only way that we can retain access to the digital objects we create and circulate in this era is by the imposition of metadata into the digital object itself. This applies to 'born-digital' media as well as the digital simulacra of celluloid cinema. As these objects are distributed, cloned, migrated to the cloud, they must have accurate, standardized metadata so that the machines that handle them will be able to do so effectively. It has been popular to talk about the 'digital dark age' because data on tape will deteriorate more rapidly than film. The real challenge to the current and past motion picture archive is metadata. Through metadata, we find an artifact among millions of others; through metadata, we know when the object needs attention and migration. Through metadata, we affix the history of the object in time to the object itself, and through metadata we make the object transparent to forms of inquiry heretofore unimaginable. Far from being arcane or superfluous, metadata is the indispensable way we know our digital objects.

Netherlands Institute for Sound and Vision is in the course of developing systems for standardizing, collating, sharing and updating and expanding the metadata we affix to digital artifacts. Projects such as OAIS and PREMIS have resulted in a system for categorizing and specifying metadata. This system appears in the form of a preservation metadata dictionary. A preservation metadata dictionary typically combines multiple object levels and perspectives, including technical metadata on the file and bit-stream level, event metadata on the object and file level, and rights metadata. The dictionary plays an increasingly important role in operational decision making, such as designing a new digitization plan, or implementing a new ingest workflow for a particular format and source.

This presentation looks at the case of DPX files as they exist in an archive in the context of preservation. A gap analysis has been performed to compare the requirements for DPX (technical) metadata and the actual metadata in the DPX files of our digitized film collection. The gap analysis is performed via a preservation metadata dictionary, which is the primary tool used to contrast statutory and actual data. On a case by case basis we continuously analyze the gap between the information objects in our archive and the requirements for a sustainable archive based on the standards OAIS and PREMIS.

The results of the gap analyses are used to identify new requirements, and to optimize data and quality management. What are our next challenges? How can we plan our processes even better? The aim of our presentation is to discuss a multidisciplinary, agile approach to optimizing data management practices for sustainable preservation.

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The Restoration of Camille de Morlhon's *Le fer á cheval* (1909)

Marcello Seregni, Fondazione Cineteca Italiana and Alice Rispoli, Cineteca di Friuli
Associazione Culturale Hommelette (Trieste)

Camille de Morlhon has an extensive filmography, and although he was one of the most productive French directors of early cinema, de Morlhon remains among the least studied. *Le fer á cheval* (1909) was considered a lost film until it was rediscovered by chance in a large lot of nitrate films on Ebay and was eventually bought in the spring of 2011 by the Associazione Culturale Hommelette. Restoration was carried out by the Associazione Culturale Hommelette and the Foundation Jerome-Seydoux Pathé and screened at last year's Il Cinema Ritrovato 2016.

After a first analysis of the 2K scan of the film, the data was digitally restored and recorded out to 35mm negative. The film, an Italian version of *Le fer á cheval*, was originally colored using the Pathécolor system, which imparts a sense of natural color to the landscape.

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B R E A K

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Building a Flexible, High Resolution Scanner for Legacy Film Capture

Daniel Borenstein, Centre national du cinéma et de l'image animée, Bois d'Arcy
and Chris Hall, Filmlight Ltd., United Kingdom

The CNC vaults contain roughly 1 million film cans, representing approximately 110,000 titles from the early days of cinema in the 1880s to the present. The plan to digitize all these films, whether for restoration or for projection purposes, presents a unique problem considering all of the various film gauges found within the inventory. These films account for more than 50 different film gauges or formats, some of them obsolete (9.5mm, 28mm, etc.), most of them experimental or unsuccessful attempts for new standards (15mm, 75mm). The CNC first embarked on an analysis of the collection to identify and characterize the diversity of the holdings - a study which revealed the aesthetic richness and technical innovation in the formats that have been introduced over the years since the earliest chronophotographs.

Once the scale of the project was defined, the CNC went about specifying a technical solution capable of addressing this technical diversity. The idea of reverse engineering and rebuilding printing or scanning devices for each and every gauge of film was clearly untenable. While there are still readily available solutions for 16mm and 35mm film, the problem of non-standard gauges, differential frame size and unique perforations made it highly unlikely, and indeed technically sub-optimal, to attempt to address digitization of the collection through modification of currently existing devices. The large variety of these simple technical characteristics led to the design of a scanner with flexible parameters, with a gate capable of accommodating almost any gauge, an optical system capable of imaging almost any shape, and a system of transport and registration independent of the film edge, perforation size and shape, and frame lines.

The presentation will first take a broad look at the wide variety of film formats in the CNC collections. The discussion then moves to the challenge of handling these formats and describe a scanner built to accommodate our needs. Finally, we will project some amazing footage shot by the Lumière brothers for the Exposition Universelle held in Paris in 1900, in 75mm gauge, which was the first large format in the history of the motion picture industry.

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Preserving Imperfection - Ethics and Pragmatism in Digital Preservation

Tone Føreland, National Library of Norway

A Norwegian state office, Statens opplysningskontor for husstell (Information Office for Home Economics), made 41 films of informational, educational and instructional use for domestic science from 1940-1970. How to bake and cook different kinds of food and get an efficient and modern kitchen was more important than perfect takes, lighting and sound. The message was the main purpose. Technical perfection was not. We are currently working on ten of these titles, doing analog preservation from the original negatives. In this work we are also preserving the imperfections as they are already in the negatives. To give access to these titles they will have to be digitized. In the digital post production the possibilities to "clean up" the films are nearly limitless. So how can the digital tools be a challenge in regards to keeping the ethics in preservation, especially when the technical quality of a film is poor? I will give examples from our work with these films to show how important it is to be conscious about ethics when it comes to digital preservation compared to analog preservation.

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Monday

Innovating Analogue Lab Techniques for Use in the Digital Age

Gerard de Haan, Haghefilm Digitaal

For archives and other institutions that intend to use legacy film resources, it is important to have access to laboratory techniques that are both historically accurate and economical. This presentation will discuss three viable workflows that meet these criteria, and provide a foundation for the creation of hybrid resources that can be deployed as both analogue film prints or digital resources.

It is widely understood that achieving correct colour by analogue printing of stencil colour in early nitrate film is impossible, due to the fact that the dye-colours cannot be represented by existing chromogenic film materials. However, the visual characteristics of stencil colour can be emulated by digital scanning and display, because these techniques do not have the inherent limitations of colour-coupled chromogenic emulsion. A lookup table (LUT) has been developed based on extant stencil color examples, to simulate close to correct dye-colours in a digital context. This is the foundational tool that supports the capture, calibration and ultimately transfer of original colour from a wide variety of technologies and applications to new film and digital resources.

In order to provide archives with ethically correct digital assets of their analogue Original Cut Negative film (OCN), a digital emulation of the analogue printing process as it is used on a film printing machine has been developed. The OCN is scanned at 2K or 4K. Then, the punched paper tape with printer lights for colour correcting the negative in the printing process is read and translated to an edit decision list (EDL) with digital colour corrections. The Digital Intermediate device (in present practice, the Nucoda Filmmaster) is in effect used as an analogue film printer. This results both in superior quality and historically accurate colour correction for the digital result (DCP and video) and a significant cost savings at the same time.

A unique extension of the technique described in the paragraph above is applied to achieve the same results for the very popular Desmet Method for printing early dye-tinted and chemically-toned 35mm nitrate film. Through this emulation of the Desmet Method, the digital result strongly resembles prints created using the original analogue Desmet technique. As with the second option, this is a cost effective method for producing colour-correct digital assets from existing Desmet prints.

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Recovering Early Optical Sound

Simon Lund, Cineric, Inc.

The extraction of accurate audio information from optical soundtracks remains a challenging area in the field of restoration. This presentation details recently developed methods, including wet-gate scanning of optical soundtracks (including non-standard tracks) and the removal of cross modulation distortion in motion picture soundtracks through post-processing of optically scanned audio files. A case study of the work conducted with Joshua Harris (head of the Media Preservation Unit at the University of Illinois) will present the results of a recent project to fully preserve and decode audio from the first successful public demonstration of a composite sound-on-film system.

This system, demonstrated by Professor Joseph Tykociner in 1922, led to the eventual adaptation of sound-on-film as the standard format for the motion picture industry. Surprisingly, the only known attempt on the part of the audio industry to demonstrate a historical reconstruction of Dr. Tykociner's system, which took place in the 1950s, was unsuccessful due to a range of factors including non-standard track placement and frame rates. The recent Tykociner restoration effort faced the same problems, but the flexibility of the innovative digital system deployed by this project was able to circumvent problems of reading and interpretation of the audio signal (spatial disposition, frequency, noise) by optical scanning, and novel image and signal processing. The ability to hear and evaluate a true reproduction of Tykociner's sound is an important contribution to the history of the cinema. These methods offer the promise of capturing, preserving and reproducing other important artifacts of early motion picture audio innovation.

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Acoustics for Small Rooms

Gilles Barberis, Immagine Ritrovata and Lorenzo Rattini, DAS - DecoAcousticSolution

Restoration labs and archives have traditionally been hampered by the limited space in which to conduct their work, and none more so than the relatively small rooms in which audio engineers normally work. This presents many acoustical challenges. Strong physical restrictions of such rooms require adjustments in design in order to create a working context, a listening environment capable of rendering all of the subtleties of a specific and unique audio artifact, and to restoring and designing sound a range of environments ranging from small rooms to much larger spaces, such as cinemas, concert halls or auditoria. For example, in small rooms, music recording stages, recording and mastering studios, re-recording and restoration environments or home theaters, reverberation is strongly reduced compared to the normal acoustic situation in a medium- or large-sized room.

This presentation is specifically addressed to those restoration labs, archives, and digitization facilities that do not have space for a large mixing stage. The aim is to provide guidelines on how to achieve a good listening environment by means of effective and relatively cheap solutions. The topic will be introduced by an overview of the characteristics of optical soundtracks, as they are extracted by modern equipment, played back in near-field environments, and prepared for a variety of play-back contexts. Attention to the specificities of any historical sound technology, the method of sound reproduction and the range of variables characteristic of the system and its performance within the context of modern reproduction, is critical to successful conservation and restoration of audio resources. Thus, this study underlines how crucial our listening environment is to achieving any project's goals.

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B R E A K

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Restoring Ula Stockl's *Neun Leben Hat Die Katze* (*The Cat Has Nine Lives*, 1968)

Julia Wallmüller, Deutsche Kinematek

Neun Leben Hat Die Katze (*The Cat Has Nine Lives*) is Ula Stöckl's first film, shot in Techniscope and printed in Technicolor. The film was restored in 1996 from a contemporary Technicolor copy. The original Kodak negative could not be used as a source for the restoration back then, since it was impossible to recreate the Technicolor look in the analogue workflow. In 2014, Deutsche Kinemathek digitized the film from its original Techniscope negative. The challenge was to transfer the Kodak negative image into an authentic Technicolor look. This could be achieved during an intensive grading process, applying modern grading techniques inspired by the analogue Technicolor process based on separate colour layers. The approach within this restoration and colour reconstruction was not a scientific one but was based on pure colour perception and the nature of the Technicolor process.

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Traditional Photochemical Printing - Sharing Laboratory Techniques

Tiago Ganhão and Paolo Bernardini, Cinemateca Portuguesa

It's commonly accepted now that we are facing a major risk of losing photochemical knowledge associated with film restoration. We believe that labs still engaged with photochemical restoration and preservation, especially the ones within film archives, should have a proactive attitude regarding this issue, building and sharing knowledge to the best of their abilities.

The presentation will detail our collaboration with Udine University, Italy (Facolta degli Studi di Udine-Corso DAMS-Discipline delle Arti Musica e Spettacolo - Sede di Gorizia) which occurred last year when we invited some students to attend the first Lisbon Spring School, a one-week intensive workshop, focused on the production of a new Desmetcolor print. Starting from an original, tinted nitrate positive, a wet-gate printed duplicate negative was created, and a contact print was made using the Desmetcolor method.

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The Digital Release of *Napoléon vu par Abel Gance* (1927)

Ben Thompson and Kieron Webb, BFI National Archive

Of all the previously unimaginable events that took place in 2016, the UK release of *Napoléon* is probably the greatest. Abel Gance's heroic depiction of the rise of Napoleon Bonaparte is an undisputed cinema landmark. Famed for its ground-breaking innovations – including its famous triptych finale – and a running time of 5 ½ hours, Gance's epic traverses many of the formative experiences that shaped *Napoléon*'s rapid advancement in an incredible feat of photography, editing and technical ingenuity.

Kevin Brownlow first saw this mythical work as a schoolboy in 1954, in a cut-down 9.5mm version. Sixty-two years later, his full restoration is available in the cinema and, for home viewing once again, on Blu-ray.
The current restoration is the culmination of five decades of rediscovery and restoration on the part of the Academy Award-winning film-maker, archivist and historian, working with his colleagues at Photoplay (initially the late David Gill, and then Patrick Stanbury), and the BFI National Archive.

The variety and vibrancy of toning and tinting is a crucial aspect of *Napoléon*, and the digital mastering of the restored 35mm negative required a complete digital recreation of the film's complex colour scheme. Colours were referenced against original examples and generated using a digital tinting process. *Napoléon*'s triptych finale on 35mm film stands as an exhilarating challenge to the bounds of cinema. Extremely careful consideration was given to the digital projection of the triptych in order to present it accurately in a variety

of theatrical circumstances, respecting the original three-screen aspect of the film. Similarly, the Blu-ray allows audiences to view the three panels separately – or even to create their own three-screen version! Of course, all the digital masters had to be synchronized with Carl Davis' score, now mixed in 7.1 channel sound.

November's premiere at London's Royal Festival Hall, with Carl Davis conducting his indelible score, marked the start of forty cinema screenings in two months. In this presentation, the team will describe and illustrate the challenges – and pleasures – of making this astounding work available in digital formats. Kevin Brownlow's legendary reconstruction of *Napoléon* represents, in our opinion, the greatest example of a film's rescue from misunderstanding and unavailability. The release of the restored versions has contributed significantly to the theatrical revival of silent cinema.

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B R E A K

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Preservation and Accessibility of Digital Born and Digitized Film

Jeroen de Mol and Annegien Schrier, EYE Filmmuseum, Amsterdam

It is a well-known fact that in recent years moving image preservation has taken a dramatic turn from not only safeguarding analogue material, but also to conserving born-digital and digitized film. Although there seems to be some consensus on which formats to use for archival storage, much is left to the imagination as to how to streamline the preservation process and how to make this "easy digital format" accessible and re-usable. EYE has implemented software doing just that: EYE-D.

We will share the challenges we've faced during the development process and how we solved them. This includes the chosen technologies, such as an LTFS LTO system, and the way we've integrated EYE-D with our existing setups so information can be communicated between them ensuring no file becomes orphaned or gets lost.

A live demonstration will be given of this self-regulated system, which will include its automatic metadata extraction, the exchange with our catalogue Collection EYE, use of the MediaInfo library, the naming convention, and the data mining of DCP XML files. Additionally, we show the integration of each phase of the workflow and how digital components such as a ProRes file, a DCP, or a DCDM, are written to LTO 6, added to the catalogue, and prepared for access.

The second half consists of presenting the front-end of EYE-D. Our player allows users to view and order films in virtually every desirable format using the FFmpeg library. Footage can be instantly shared with third parties and collections can be made. These features allow curators, programmers, researchers and students to gather assets belonging to a certain topic, program, director or any imaginable criteria.

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The REMI Project - Handmade Emulsion Primitive Colour

Esther Urlus, WORM Filmwerkplaats

REMI (Re-engineering the Moving Image) is a two-year European cooperation project run by Mire (Nantes, FR), WORM Filmwerkplaats (Rotterdam, NL) and LaborBerlin (Berlin, DE), focused on the creation, preservation and circulation of the technical knowledge of analogue film in order to support its use as a

creative medium. The project has so far involved several film labs across the world, cinemas, art schools and other cultural organizations, as well as a broad international audience of film enthusiasts.

This presentation will focus on the Handmade Emulsion Primitive Colour Seminar, which took place in our facilities in Rotterdam and consisted of a week of research in the lab of WORM Filmwerkplaats during which international artists, working on film emulsion and primitive colour film exchanged knowledge, conducted practical experiments and tested new formulas in order to develop this research.

The Reel Thing Technical Symposium is organized and coordinated by Grover Crisp and Michael Friend

The Reel Thing regularly video-records these proceedings. These recordings are the official record of the event and are the sole property of The Reel Thing. The intended use of these recordings is to produce publicly available programs which may appear on AMIA or other websites, and which may also be made available in other commercial and non-commercial contexts at the discretion of The Reel Thing. Attendance at this event constitutes your consent to appear without compensation in these recordings and in any versions of this event produced or authorized by The Reel Thing. The organizers of The Reel Thing are always interested in new and important developments in conservation, preservation, restoration and digital asset management. If you have a project or a technology that you would like to share with the community, please contact us at any time during the year. We are also interested in feedback, criticism, and suggestions for future presentations. Let us know how we can make The Reel Thing better and more useful for you.

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