

EDITED BY GIOVANNA FOSSATI AND ANNIE VAN DEN OEVER

# EXPOSING THE FILM APPARATUS

Global Laboratory Perspectives



Amsterdam  
University  
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FRAMING  
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## **CRITICAL ACCLAIM FOR *EXPOSING THE FILM APPARATUS. GLOBAL LABORATORY PERSPECTIVES* (2025):**

“As a curator and researcher in computational museology, I read *Exposing the Film Apparatus* as both a major intervention and as a pragmatic guide. Extending the 2016 ‘research laboratory’ turn outlined in *Exposing the Film Apparatus: The Film Archive as a Research Laboratory*, this new volume advances an operational paradigm for apparatus collections: cameras, projectors, scanners, storage systems, and emulators are not inert but technologies whose ‘persistent materiality’ and operability are knowledge foundations for media history. Its core proposition—that we cannot write media history while bracketing how apparatuses work—reorients archival theory toward practice, gesture, and technicity.

The book follows trajectories I recognize from my own lab practice, shifting analysis from objects to operations through the archivability of gestures. It also it reorientates colonial narratives through situated case studies while addressing post-digital conditions in which analogue, digital, and emulated systems can coexist. Taken as a whole, these methods demand hybrid conservation, broadened access and, refreshed teaching strategies.

Two framing essays and twenty-three device-centred chapters—from pinholes and Kinoras to U-matic infrastructures to VR—translate these claims into method. Conservation becomes care, data is sovereign and pedagogy benefits when students reactivate technologies formerly kept ‘behind glass.’ More than a compendium, this is an academic framework. It equips archivists, curators, and educators with a coherent vocabulary and a lexicon for practice. Essential reading!”

SARAH KENDERDINE, PROFESSOR OF DIGITAL MUSEOLOGY,  
ÉCOLE POLYTECHNIQUE FÉDÉRALE DE LAUSANNE, SWITZERLAND

“This book is a crucial intervention at a critical moment. While the volume begins with the essential question of how we preserve the material traces of cinema, it also raises deeper questions: who has access to these technologies, and what worldviews are embodied when they are put into practice?

The chapter title ‘Empowerment or digital colonialism?’ could serve as an epigraph for the entire project. The book invites us to consider not only which devices we collect, but also how we make them operational, whom we invite to use them, and which epistemologies guide their interpretation. This book is an essential resource for anyone committed to building a more equitable and inclusive future for film and media studies.”

EDGAR VILLEGAS IRIARTE, PROFESSOR OF FILM AND AUDIOVISUAL MEDIA,  
UNIVERSIDAD DEL MAGDALENA

“Where during the analogue era the study of the often noisy ‘apparatus’ in relation to content was key, in the digital age the miniaturized, often invisible, electronic apparatus is beguilingly masked by silent computer software. The 25 chapters in *Exposing the Film Apparatus: Global Laboratory Perspectives* are written by pre-eminent scholars who examine the technological underpinnings of contemporary imaging, imagining and imagination.

This book explains why we need to be cognizant of imaging histories, the histories of imaging technologies, and how and why they were invented and used worldwide. This is an archeology from the past into the future. And what a future it has become.”

KEYAN G. TOMASELLI, DISTINGUISHED PROFESSOR, UNIVERSITY OF JOHANNESBURG,  
AND THE AWARDED AUTHOR OF *THE CINEMA OF APARTHEID*

**CRITICAL ACCLAIM FOR *EXPOSING THE FILM APPARATUS. THE FILM ARCHIVE AS A RESEARCH LABORATORY* (2016):**

“If dreams come true! The long desired collaboration between film archivists and film scholars has never been as fully realized as in this work, which is, itself, a genuine ‘research laboratory.’ Adopting an approach that constantly combines fundamental and applied research, the ‘materiality of the medium’ is studied here in an entirely novel way. Starting with the digital turn, the essential problems of technique and technology have (finally!) returned to academic zeitgeist. Not surprising since the digital, which transformed our habits and customs as spectators and researchers, promotes a daily hands-on contact, producing a shockwave in the process. By ‘bridging archival and scholarly work on film apparatus’ and recognizing the impact of the material turn (see the Introduction), *Exposing the Film Apparatus* will undoubtedly contribute to the upheaval of research methods and practices in cinema.”

ANDRÉ GAUDREULT, CANADA RESEARCH CHAIR IN CINEMA AND MEDIA STUDIES,  
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“[This] rich and extensive collection edited by Giovanna Fossati and Annie Van Den Oever represents a major book that significantly maps and expands perspectives and trajectories in the archaeology and history of technological media, and it represents a thought-provoking reflexion on the digital transition in the archival world.”

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“We are only a handful of decades into the adventure of moving images, yet already there are so many common misunderstandings about the contexts in which and for which they have been produced. This is in large part because we neglect the technologies of moving image production. This excellent collection fizzes with new approaches to understanding the apparatuses of cinema. These machines once gave life to images; now it must be our mission to give life back to these machines.”

JOHN ELLIS, PROFESSOR OF MEDIA ARTS, ROYAL HOLLOWAY UNIVERSITY OF LONDON

“This eclectic series of essays avoids the danger of prescribing how we each experience but more likely use the moving image, whilst providing a matrix of approaches to thinking about how and why those experiences are the way they are. As such, they will engage graduate and post-graduate audiences.”

MIKE LEGGETT, *LEONARDO REVIEWS*

## EXPOSING THE FILM APPARATUS



**FRAMING FILM** is a book series dedicated to theoretical and analytical studies in restoration, collection, archival, and exhibition practices in line with the existing archive of Eye Filmmuseum. With this series, Amsterdam University Press and Eye aim to support the academic research community, as well as practitioners in archive and restoration.

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EDITED BY GIOVANNA FOSSATI  
AND ANNIE VAN DEN OEVER

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Global Laboratory Perspectives

AMSTERDAM UNIVERSITY PRESS

We wish to cordially thank the Dutch Research Council (NWO) for its support for the publication of this book in Open Access. This publication is part of the project *The Sensory Moving Image Archive (SEMIA)*, file number 314-99-200, of the research programme Smart Culture, which is partly financed by the Dutch Research Council.



Published by Eye Filmmuseum / Amsterdam University Press

Cover illustration: Abstract film resulting from an experiment with the bande-cache

Cover design and lay-out: Magenta Xtra, Bussum

ISBN 978 90 4856 826 0

e-ISBN 978 90 4856 827 7 (pdf)

e-ISBN 978 90 4857 475 9 (accessible ePub)

DOI 10.5117/9789048568260

NUR 674



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# Film Inspection Tables as Historical, Operational and Learning Devices

SIMONE VENTURINI

Fossati, Giovanna and Annie van den Oever, eds. *Exposing the Film Apparatus: Global Laboratory Perspectives*. Amsterdam: Amsterdam University Press, 2025.  
DOI 10.5117/9789048568260\_CH19

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## ABSTRACT

This chapter aims to investigate the historical, epistemic, and media-archaeological status of inspection tables in operational contexts such as archiving, research and training. The literature has given scant consideration to inspection devices, one of the most basic and long-established devices for the analysis of film material artefacts. Nevertheless, the use of hand-cranked, motorised, electronic and, more recently, digital-hybrid tables has been widespread in inspecting (and viewing) practices throughout the film industry chain, as well as continuing to perform more specific functions in the archival field.

## KEYWORDS

Film inspection; material film culture; archival knowledge; data analysis; operational devices

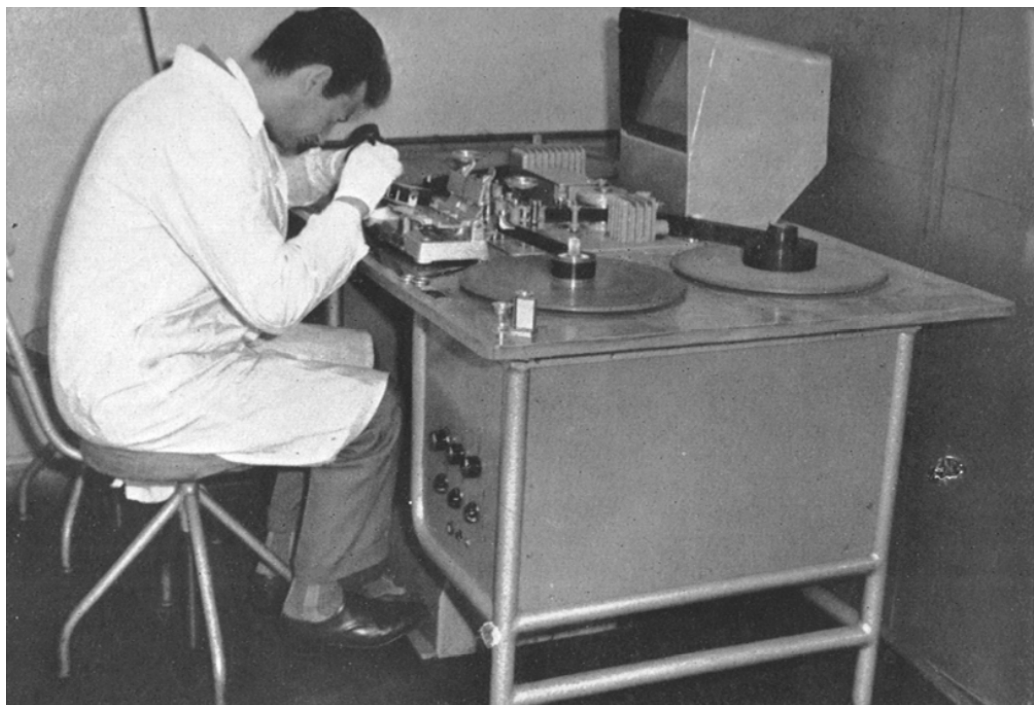


FIGURE 24  
Film examination, Volkmann, 1965.

## FILM INSPECTION TABLES

“On the left and the right sides of the table are horizontal winding plates for 300 metre or 600 metre reels, which are manually driven by means of a handle. The feed and take-up spindles of the plates should be able to accommodate different gauges, projection spools and cores. The film is wound through by hand to allow a technical inspection to be made. At the same time dirt can be removed and any damage to the perforations determined. In the printing laboratory a similar table may be used for grading.”<sup>1</sup> | 291

## THEORETICAL FRAMING

This chapter aims to explore one of the most basic, long-established and widespread devices for the analysis of film material artefacts: inspection tables. It investigates their historical, epistemic and media-archaeological status in operational contexts such as archiving, research and training. With few exceptions, the literature (in technological, historical and operational terms) has given scant consideration to inspection devices.<sup>2</sup> Nevertheless, the use of vertical, flatbed, hand-cranked, motorized, electronic-automatic and, more recently, digital-hybrid tables was and is widespread in inspecting (and viewing) practices throughout the film industry chain, as well as performing more specific functions in the archival field.

## FILM INSPECTION TABLES AS HISTORICAL AND TECHNICAL DEVICES

Inspection tables, with their essential operationalities (handling, winding, measuring, etc.), have been considered the primary equipment to “ascertain film condition,” especially since the preservation turn of the International Federation of Film Archives (FIAF) in the early 1960s.<sup>3</sup> Employed along the entire film industry supply chain (in post-production laboratories, film distribution, screening rooms, etc.), some inspection tables were “not suitable for archive work,” hence a selection was made of those fulfilling the archival concern of handling damaged and fragile films in the safest way.<sup>4</sup> The 1986 FIAF preservation manual presents the “two-plate horizontal hand-winding table” as “the most important device used for the initial examination of the film and its condition,” while viewing tables were used for a more effective “control of picture and sound quality” and comparison, re-editing and restoration purposes.<sup>5</sup> Alongside such devices, a few pages later the handbook introduces “complex machines” able to carry out “several processes simultaneously” and thus “save a great deal of time.” One was a certain “inspecting table”:

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a combined film examining machine [...] which can examine and clean the film at the same time. While the film is cleaned, its length and the number of splices are measured and the physical condition of the splices and perforations are indicated. Any deficiencies [...] are recorded on a concurrent paper band.<sup>6</sup>

The reference is probably to multiple-purpose machines marketed in the 1970s and 1980s for the technical inspection and cleaning of circulation copies (e.g., RTI Retectron, Omega, Cinescan I and II, Pulsar). They could inspect a large amount of film prints and their stop-on-splice or similar functions automatically detected damage. Hence, the operator could check, repair and produce an early kind of metadata recording. Archival discursive knowledge recognised some significant changes in the operationality of inspection tables at the beginning of the electronic transition in the 1980s. Thereafter classified as “complex machines,” they were of epistemic and historical interest because their cybernetic and electronic viewing, control and annotation systems bridged the gap between material and visual culture, and photochemical and mechanical media.

Over the last fifteen years there has been a further shift, in a certain way echoing some properties and aims of the first “complex machines,” thanks to a new generation of basic and multipurpose hybrid analogue-digital devices. Most of the current basic film winding and verification tables, such as Debie’s TR3, CIR’s D-Observer Cine3, MWA’s Steenbeck R, KEM’s KEMroll and KEM-

wind, have been progressively supplemented and integrated with electronic and digital measuring, viewing, monitoring and feedback annotation systems (motion encoders, multi-unit footage and time counters, cameras, sensors for shrinkage, etc.) to collect metadata, and inspect film stock in the most efficient and gentle way. In such state-of-the-art devices, the film transport is controlled by sensors and a CPU to keep the tension balanced and movement smooth. They are built to manage fragile stock and avoid capstans, sprockets or rollers touching the film. Film handling is increasingly protected, separating film from its mechanical and manual a priori. The state of preservation plus primary and secondary information are detected and annotated by means of specific observational and documentation instruments, integrating the functions and aims originally assigned to film winding and technical inspection tables, as well as those peculiar to viewing tables in a single device. So, to guarantee the film's protection and provide video assistance in the process of material and visual description and analysis:

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the D-Observer table was initially developed as a simple tension-controlled winder having as first rule the protection of the film integrity [...] the following natural evolution was the implementation of a video subsystem for helping the operator during the inspection process.<sup>7</sup>

The currently most advanced inspection tables merge traditional film handling and inspecting with other environments and frameworks, progressively blurring the boundaries between diagnostics, viewing, scanning and annotation. Such hybridisation and convergence is found in multipurpose equipment such as Kem's KEMview; MWA's Spinner V multiformat viewing table; Debie's Scantable Perfecta, advertised as an "all-in-one" device;<sup>8</sup> CIR's D-Observer and D-Archiver, presented as an "all-in-one solution for film archiving";<sup>9</sup> "the bridge connecting analogue and digital"; and more recently Cube-Tec's INSPECTIONSCAN, introduced as "the most relevant invention for inspecting archival film since the rewinder," reframing inspection in itself as "the enabler for preservation."<sup>10</sup>

Their discursive marketing (commercial brochures, technical descriptions, etc.) reveals a few underlying principles: *protection of film integrity* through electronic and digital transport systems; *hybridization* and *convergence* of several archival and media environments and routine workflow tasks (inspection, repair, scanning, post-production, access); *automation* and *datafication* of film inspection by adding smart tools as well as metadata archiving, analysis and sharing; and *superimposition* of an operational culture and paradigm over a haptic and multisensorial approach to the film artefact.

## FILM INSPECTION TABLES AS ARCHAEOLOGICAL AND OPERATIONAL DEVICES

Continuous, encoded and touchless film transport and handling management systems, digital cameras and film scanning technologies facilitated the availability of high-quality digital access copies, marginalising the use of traditional viewing tables that had a high mechanical impact on the film. There are essentially three reasons why it is necessary to produce digital proxies or facsimiles: to safeguard the originals, allow widespread access, and enable machine-assisted visual analysis.<sup>11</sup> The viewing functions were therefore absorbed by film scanners and most of the above-mentioned inspection tables, which replaced the original with its digital remediation and metadata during the analytical phase. Despite being designed for the “evaluation, visual and haptic study” of film materials, the tactile and sensorial relationship with the film stock is mediated by several interfaces.

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But it would be wrong to say that there is no longer any haptic mediation or direct observation during the inspection process. The use of manual inspection benches still plays a central role in the most up-to-date film archives and labs. In other words, the deepest layer of cultural film handling and inspection practices and techniques is still present. The tacit gestural knowledge,<sup>12</sup> “operational hand,”<sup>13</sup> and “invisible labour”<sup>14</sup> activated by touching and handling apparatus, artefacts and pictures is a crucial aspect of inspection and technical restoration work. Nonetheless, little attention is paid to the various basic accessories used to support film handling, repairing, magnifying, measuring, etc. As non-discursive traces of archival knowledge, they are as much standardised tools as they are the result of craft and DIY labour practices and technical workers’ behaviours and values. Hence, they can share inclusive, sustainable and smart handling and inspection solutions, and kit for global, grassroots film care.

It is useful to note, however, that the hands-on archival labour, performative learning of film material culture, and embodied knowledge of inspection benches is being redefined by the tendency towards large-scale automatization, datafication and standardisation, pushing film inspection into a new operational environment. Several years ago, in *Schnittstelle* (1995), Harun Farocki demonstrated “the operational differences between film editing and video editing in terms of fingertip activity, showing in close-up [...] fingers touching the filmstrip to feel the cut and the glue and [...] pushing the buttons of the video editing console without physical contact with the video tape.”<sup>15</sup> Starting from its chirocentrism and performative a priori, the inspection table is both a labour and knowledge-building environment and an interface whose performative and operational conditions of film handling, inspection and documentation have altered over time. The film material artefact, framed

by advertising strategies and the concrete operationalities of state-of-the-art devices, is being handled and touched less and less. Preliminary activities to prepare the original are pared back. As in linear video post-production and viewing tables, the “performative hands” are connected to jog/shuttle wheels. At the same time, touchscreens allow the operator’s hands to govern multiple machines and instruments for semi-automatic film inspection and annotation, real-time image measuring, scanning and production of access copies to avoid handling of the original. Over-scan and edge-to-edge proxies become valuable elements for the archive, as well as providing an annotated guide and image-model and reference for subsequent post-production tasks.

These multipurpose tables create an entangled epistemic framework of material, visual and invisible data culture. Following the recent debate about operational images, Parikka highlighted Thomas Elsaesser’s speculations about Farocki’s interest in simulations, not as a replacement of reality, but as a chain of synthesis.<sup>16</sup> Similarly, the *operational turn* of the current advanced diagnostic and inspection devices is not to digitally remediate or mimic the film material artefact, but to superimpose data, tools and interfaces over the film source, in a sort of multilayered “media archaeography” of the film itself—in other words, in “modes of writing that are not human products but rather expressions of the machines themselves.”<sup>17</sup> Inspection practices and discourses have become part of a wider operational and experimental system, a network comprising several different components marked by multiple reconfigurations and readjustment patterns, in which “phenomenon and instrument, object and experience, concept and method are all engaged in a running process of mutual instruction.”<sup>18</sup> The concrete components of these operational inspection devices include annotated digital proxies, analytical and diagnostic software, diagrammatic and statistical inspection reports, calibration images and tools, and integrated databases and AI tools for film material culture identification and learning.

## FILM INSPECTION TABLES AS LEARNING AND TRAINING DEVICES

Film inspection, rooted in the first half of the twentieth century, can be understood as a genealogical method for producing historical knowledge from the observation and classification of specific material traces and clues. Analysis of the physical characteristics of film,<sup>19</sup> as an aid in the identification and hence application of the circumstantial and evidentiary paradigm to the study of the film’s material culture,<sup>20</sup> still plays a leading role in both the academic and archival worlds. At the end of the twentieth century, the survey of physical film conditions and the examination of the secondary information preserved on

film as a historical and cultural artefact started to become deeply intertwined in many publications dedicated to film preservation and early cinema history.<sup>21</sup> A few years later, in the Bologna School and Gamma Group publications,<sup>22</sup> or in widely known handbooks,<sup>23</sup> inspection was explicitly conceived as a *learning* methodology and techno-cultural milieu for understanding film.

Inspection tables inhabit a specific dialectic within this framework, since they are both technical and epistemic objects.<sup>24</sup> They embody tacit knowledge and perform the role of media interface for framing the cinema history inscribed in the film material artefact. More to the point, they can be recognised as a relevant agent and founding apparatus of archival and historical knowledge. Consequently, with the new hybrid devices mentioned above, how does the paradigm of film inspection change in terms of heuristics, learning and training approaches?

296 | The manual work carried out on inspection tables creates a learning model in which sensory examination and direct observation (or that mediated by basic interfaces, such as the canonical loupe) are driven by the above-described semiotic and forensic paradigm (*learning from film*). With the introduction of encoded transport and the recognition of specific defects, a film's condition is learnt through a cybernetic paradigm, namely, through feedback given to the operator by the control system (*learning from signals*). Ever since the 1970s, specific anomalies such as “thickness splices” have been “touched” and “recognised” by the machine and, through a specific light-graphic signal, the operator is invited to act and the process is thus inserted into a longer operational chain.

Since the 2000s, digital mimicry and film scanning technology have enabled archivists and scholars<sup>25</sup> to make (edge-to-edge) digital witnesses of film materials for documentary purposes.<sup>26</sup> In this case, the inspection and learning process is based on the digital modelling and display of the film, which is used for diagnostic and scholarly purposes according to precepts and logics typical of the digital humanities (*learning from digital*).<sup>27</sup>

More recently, multipurpose tables such as the D-Archiver and INSPECTIONscan have added a further layer, embracing a process of data- and operational-culture-based inspection (*learning from data*).<sup>28</sup> These devices offer integrated software both for quality control and for annotating historical-material characteristics. In the words of its developers, Quadriga INSPECTIONscan puts into practice “a lot of archival expertise already built into the machine.” In semi-automatic mode, it can document frame by frame, integrating operator annotations, displaying results in charts and diagrams, and estimating “an overall quality rating on the photographic and mechanical condition.”<sup>29</sup> The inspection report and digital access copy loaded onto a viewing interface creates an advanced inspection environment (metadata,

matte overlays and tools, timeline of detected defects and faults). The convergence of annotation software, inspection devices and meta-data has obvious implications in the analysis of single events or the evaluation of statistical accumulations for archival, creative and scientific purposes. Their impact on the training processes of archival practitioners is less self-evident. On this last aspect, INSPECTIONscan presents two interfaces that mark a pioneering step toward forms of inspection learning practices based on machine-driven cognitive processes.

The first (Wizard) is an identification tool. The touch screen peripheral and its flowchart convey the know-how traditionally transmitted by hands-on and oral means to laboratories, archives and universities.<sup>30</sup> It is now interaction with the operational interfaces that educates the decision-making models, and thus the operator, concerning which inferential processes to follow and choices to make to understand film materials. A second application, the Edge Printing Inspection/Decrypter, explicitly takes up Brown's paradigm in the device. By combining AI algorithms, recognition systems and databases, it unveils the "alchemy" involved in the "deciphering of the information on the film edges," unknown to most and in the hands of a few experts of a "highly complex science [so as] to make the wealth of useful information hidden outside the image area accessible to users in simple forms."<sup>31</sup>

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In this latter direction, inspection tables go from being apparatuses of a hands-on relationship with the film artefact and alchemical foundation of an esoteric archival and historical-philological science to operational environments that redefine the role of archival workers and researchers, the agents at play, and the tacit knowledge inscribed in visual and material film culture.

## NOTES

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- 21 Among others, see Brown, *Physical Characteristics of Early Films*; Paolo Cherchi Usai, *Una passione infiammabile* (Turin: UTET, 1991).
- 22 Among others, see Paul Read and Mark-Paul Meyer, *Motion Picture Restoration* (Oxford: Butterworth-Heinemann, 2000).
- 23 National Film Preservation Foundation, *The Film Preservation Guide: The Basics for Film Archives, Libraries and Museums* (San Francisco, CA: NFPF, 2004).
- 24 Van der Heijden and Kolkowski, *Doing Experimental Media Archaeology: Practice*.
- 25 Rudolf Gschwind, "Restoration of Movie Films by Digital Image," in *Preserve then Show*, eds. Dan Niseen, Lisbeth Richter Larsen, Thomas C. Christensen, and Jesper Stub Johnsen (Copenhagen: Danish Film Institute, 2002), 168–178; Simone Venturini, "From Edge to Edge: The Restoration of *La battaglia dall'Astico al Piave* (1918) and the Search for a Digital Historical-Critical Infrastructure," *Cinergie* 20 (2021): 45–68.
- 26 Serena Bellotti and Andrea Mariani, "The Digital Witness: Film Reconstruction and the Forensic Imagination in New Media Environments," *Cinergie* 20 (2021): 27–43.
- 27 Willard McCarty, *Humanities Computing* (London: Palgrave Macmillan, 2005).
- 28 Such a historical-epistemic and operational taxonomy should not be taken as absolute, but rather as exemplifying "political" forces of technology (Benoît Turquety, *Politiques de la technicité* [Milan: Éditions Mimésis, 2022]), marked by different community and technological interests, as is the case, for instance, with the entry into 2025–2026 of a new mobile and portable inspection table marketed by CIR: the "Nomadic Archival Inspection Bench" (Banco Ispezione Archivistica Nomade, BIAN). An essential, affordable device designed in collaboration with newly established Italian grassroots (non-theatrical) film archives, it was conceived to meet the needs of analysis of film collections in their territorial sites of preservation and with, at its core, an archival thinking sensitive to post-colonial and global-south issues and the permanence of collections in local communities.

- 29 Cube-Tec, "INSPECTIONscan.one," n.d.  
30 Karen F. Gracy, *Film Preservation* (Chicago: Society of American Archivists, 2007).  
31 Cube-Tec, "INSPECTIONscan.one."

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