



# Handmade films and artist-run labs: The chemical sites of film's counterculture

November 23, 2018 / in [Autumn 2018\\_#Mapping](#), [Features](#)

**Tags:** [analog media](#), [experimental film](#), [lab](#), [media archaeology](#), [re-enactment](#)

by Rossella Catanese and Jussi Parikka

## Introduction: Counterpractices in artist-run film labs

It is safe to say that much of the contemporary artistic practice with moving images is concerned with materiality and technique. This interest can be seen in the practices and methods involving building and dismantling machines and devices, working with the chemistry of film emulsions, and engaging with the processes of the moving image. The work digs deep into what constitutes film as a material process and also, importantly, what infrastructure enables this practice. In other words, film becomes emphasised as a hands-on practice that explores both a relation to the technological apparatus and to film and media history. In fact, such practice is inspired by a variety of different experiments, among which, for example, the camera obscura as an elaboration on the concepts of image-making, materiality, and



Share this page



NECSUS  
Newsletter  
sign-up

SIGN UP

absence in Sandra Gibson and Luis Recoder's *Obscurus Projectum* (2011), or the countercultural forms of film history like *écriture feminine*, and practices of film editing such as quilting in Kelly Egan's *c: won eyed jail* (2005) and *Athyrium filix-femina* (2016). A multitude of others could be mentioned.

This article addresses such practices that make film and media history either directly or indirectly present and operative in current contexts of film and hence also operative in the infrastructures and sites that enable the experimental work with analogue films. This article both surveys contemporary discussions in this field and articulates the field in relation to media archaeology. In other words, these are not moments of narrative media history but practice-based recircuiting of film from chemistry to other material forms of agency. Our main argument is that artists' film labs are the contemporary site of reperformance of the analog film and that this reperformance is an explicit or implicit form of media archaeology as experimental practice, as Annie van den Oever and Andreas Fickers have coined it. Hence, drawing on existing research, discourses, and discussions with contemporary experimental filmmakers in and out of labs, we focus on these sites of creation, preservation, and circulation of technical knowledge about analog film. These film practices are part of a heterogeneous landscape of practices of the moving image in digital culture – in which context they always have been (too) easily described as old or obsolete, but, as we argue, part of the work challenging *psychopathia medialis* (Siegfried Zielinski's term):<sup>[1]</sup><sup>[#\_edn1]</sup> a confining standardisation in contexts of media production and technological culture. Hence the artistic practices – but also their sites as educational

## Tweets by @NECSUS\_ejms



**NECSUS\_Jourr**  
@NECSUS\_ejms

From the new Autumn 2018 Features section: "The playfulness of Ingma Bergman: Screenwriting from notebooks to screenplays" by [#AnnaSofiaRossholm](#) Read it here: [necsus-ejms.org/the-playfulness...](https://necsus-ejms.org/the-playfulness...)

15

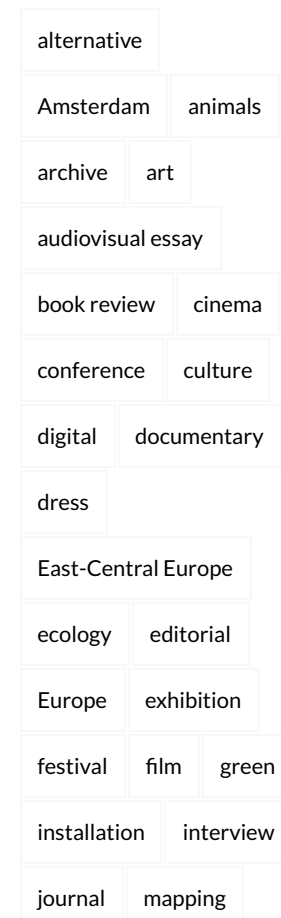
NECSUS\_Journal  
Retweeted



**Dr Rebecca Williams**  
@augustaquarius

[Embed](#) [View on Twi](#)

## Tag Cloud



contexts that engage with this heterogeneous reality of 'old' media practices – are part of a post-digital[2].[#\_edn2].culture of practices and aesthetics of 'disenchantment with digital information systems and media gadgets'[3] [#\_edn3].that also speaks to the legacies of Super8, 16mm, and 35mm and much more, not only as nostalgic returns but as reimagined futures.

Addressing images as emerging from material practices and their various socio-historical contexts establishes a way to engage with the labor and layers of film. Such practices reverse-engineer but also re-assemble those historical moments of materials and imaginaries, experiments and their stabilisation in ways that becomes significant for historical scholarship but, importantly, also for creative practices irreducible to film *history*. In many cases, these includes artists' factual knowledge about the film apparatus in terms of their technological details, aesthetics, and also cultural contexts, histories as well as potentials of use that are not exhausted in their original context of emergence.

Our interest moves from aesthetic practices – including other forms of experimental film practice[4].[#\_edn4].at the fringes of film, such as ex-cinema[5].[#\_edn5].– to the conditions of those practices; this refers to the infrastructures of existence of aesthetic practices that we engage through a discussion of the contemporary artist-run film lab discourse. There are plenty of international examples of projects and film labs working with analog film in different ways whether as an actual film chemistry production lab or artist-run centre. Although this list is far from exhaustive they include: Iris Film Collective (Vancouver), The Double Negative Collective (Montréal), Negativland (Ridgewood, NY), Mono

media	media studies	
NECS	new media	
open access		
phenomenology		
philosophy	politics	
research	resolution	
screen studies		
tangibility	television	
traces	true	video
vintage	war	waste
workshop		

No Aware (Brooklyn, NY), Big Mama's Cinematheque (Philadelphia), ANYEYE (Beverly, Massachusetts), Artistic Film Workshop (Melbourne), Nanolab (Vic), Kinolab (Bogotá), Space Cell (Seoul), no.w.here (London), Mire (Nantes), L'Etna (Montreuil), Studio Één (Arnhem), WORM.Filmwerkplaats (Rotterdam), Filmverkstaden (Vaasa), LaborBerlin (Berlin), Analogfilmwerk (Hamburg), Crater Lab (Barcelona), Baltic Analog Lab (Riga), Átomo 47 (Porto), FilmKoop Wien (Vienna), Zebra Lab (Geneva), Unza Lab (Milan), Klubvizija (Zagreb), and many others.[6].[#\_edn6]. These labs and collectives are focused on the creation, preservation, and circulation of technical knowledge of analog film as a creative medium. They operate through a social and collective experience, even if there are clear differences in their focus, from analogue and hand-processing techniques to photochemistry.

Our purpose is neither to offer an exhaustive summary or typology of existing labs nor to claim that all these labs and collectives work in the same way or share the same ethos and spirit. We do however try to articulate some key points about their common position in (post)digital culture and how they relate to debates about media archaeology as an experimental practice in specific sites and infrastructure. This perspective furthermore relates to debates about labs as collaborative artistic spaces involved with technical work, leading us to consider how practices of working with photochemistry and emulsions reimagine the moving image in contemporary settings.[7].[#\_edn7]. From an opposition of analog vs. digital emerges a plethora of practices and materials that are more fluid in the way they depart from a linear media history.[8] [#\_edn8]

Of course, the decades-long transition to digital also relates to curating and caring for a multitude of other practices: many artists are currently seeing it as their task to care for<sup>[9]</sup><sup>[#\_edn9]</sup> the future of analog film and at the same time to articulate its potential beyond *preservation* of the past or *extending* the life of film. Experimental practices rely on the infrastructures of the lab familiar from the history of film as an industrial technique but also resonating with the contemporary context of media and humanities labs.<sup>[10]</sup><sup>[#\_edn10]</sup> We address artist-run labs as shared spaces, often international networks, cooperatives, and collectives; besides fulfilling technical work related to, for example, photochemistry, labs can sometimes function as experimental media archaeology sites, practicing techniques that have been used during the early days of cinematography<sup>[11]</sup><sup>[#\_edn11]</sup> and now recontextualised as part of a living legacy of film and media. We argue that this is not just a nostalgic revival but a method of exploring materials and practices. Besides practices that return the lab to a kitchen – or the ‘bathtub model’<sup>[12]</sup><sup>[#\_edn12]</sup> – it is clear that even disuse and obsolescence emerge as a spinoff of technological change since the 1990s.

### **Practice and specificity: Second lives**

Trailing the emergence of digital cinema and its infrastructures, the leftovers of other techniques have become part of the afterlife of labs. In Genevieve Yue’s words, ‘[s]aved from the scrap heap, many discarded contact printers and lomo processing tanks have begun a second life as artists’ tools.’<sup>[13]</sup><sup>[#\_edn13]</sup> Disused film practices such as film printing and developing, splicing, tinting, toning, direct-on-film painting, etc have been reborn through recycling of dismantled

equipment by the film labs and given rise to the culture of do-it-yourself film chemistry.

French experimental filmmaker Nicolas Rey, co-founder of the artist-run lab L'Abominable,<sup>[14]</sup> traces artist-run labs to the origins of cinema, when the filmmaker had to work on all stages of film production, including chemical development and printing.<sup>[15]</sup>

According to Rey, throughout the historical development of cinema, the increasing need for standardisation led to the exclusion of filmmakers from the laboratory stages of film production, establishing the very familiar story of cinema as technological industry. However, Rey argues that many directors were also lab technicians: examples include Robert Flaherty in the 1920s and, thanks to the spread of experimental cinema as part of filmmakers' co-operatives, many others from the end of the 1950s onwards, echoing the words of contemporary lab practitioners such as Negativland: '[y]ou need to be a technician *and* a filmmaker.'<sup>[16]</sup>

Traditionally, creative practice and preservation have been very distinct fields of expertise in film, but the discourse of the 'death of cinema' has also become a site of its constant rebirth.<sup>[17]</sup> As Paolo Cherchi Usai puts it, '[t]he main aim of each project of preservation of the moving image is therefore, *strictu sensu*, an impossible attempt to stabilise a thing that is inherently subject to endless mutation and irreversible destruction.'<sup>[18]</sup> Indeed, according to André Gaudreault and Philippe Marion, any death 'would open the door to a kind of new birth, one associated with a "restoration" or a bringing back to life of the integrative and intermedial nature of the medium's first birth when the apparatus was invented.'<sup>[19]</sup>

Recently, the terminology of the 'lab' has become discussed also in contexts of film archives and preservation, shifting and challenging 'the film-centered approach' to include apparatuses and also, as we argue, photochemistry.<sup>[20]</sup><sup>[#\_edn20]</sup> Extending the work of archives, which already include a setting of dialogue between the current mediascape and moments of film history, artist-run film labs provide experimental sites for practices of film preservation. Film's cultural history and material knowledge become intertwined while both film archives and labs depend on wider infrastructures for their basic materials: 'this has created the need for collaboration which may in itself lead to closer working on other issues, but there will always be the essential difference and tension between the two of doing and fixing, between taking and retarding action',<sup>[21]</sup><sup>[#\_edn21]</sup> as Guy Edmonds from Filmwerkplaats Lab articulates. Both profit and non-profit preservation labs, including ones in academic and research environments,<sup>[22]</sup><sup>[#\_edn22]</sup> attempt to manage and contain the material decay of film; artistic practices, instead, often catalyse the destructions as part of their work.

Kim Knowles emphasises that artist-run labs' purposes include preservation and re-use in the context of technological obsolescence, since they are the sites where 'an economy of recuperation, re-use, and recycling of old materials represents a stark alternative to [...] a throwaway culture of constant upgrades and relentlessly "new" electronic goods'.<sup>[23]</sup><sup>[#\_edn23]</sup> Knowles shifts from an argument on preservation and archival heritage towards a concept of re-use against obsolescence:

[i]n this sense, the countercultural potential of film can be seen to operate on two

interconnected levels: first, the use of old technology such as 16mm film emerges as an 'archaic choice,' which outwardly rejects the forward drive of capitalist progress and its obsession with the 'relentlessly new'; second, in an era of digital filmmaking, working with celluloid requires the analog artist to enter into a temporal contract with its physical materials that is at odds with modern society's benchmark of speed, efficiency, and instantaneity.[24].[#\_edn24]

Such 'archaic' artisanal practices have been central to the history of experimental film language for decades, but currently their meaning is impacted by an aesthetic and ideological significance related to the positioning of analog filmmaking against the contemporary (digital) media landscape. No wonder, then, that part of the discourse of labs and practitioners relates to a counterculture of film.

### **Analog resistance: Countercultures of film**

The origin of the artist-run lab movement emphasises the labs' countercultural relevance as well as highlighting, in Yue's words, how it 'has historical roots in the independent strain of the avant-garde'. [25].[#\_edn25]. According to Pip Chodorov, the statement of the New American Cinema Group manifesto [26].[#\_edn26]. led to the founding of the New York Filmmakers' Co-operative in January 1962. In 1966, the establishment of the London Filmmakers' Cooperative, inspired by the more established New York Film-Makers' Co-op (Steve Dwoskin, from New York, was among the founders), expanded on its US model, since the British cooperative worked as a collective space and a production space for experimental filmmakers. In many ways, the London Filmmakers' Cooperative established a key model for further artist-run labs



worldwide,[27].[#\_edn27].while its ideas about countercultures, DIY, and grassroots were articulated in multiple contexts.[28].[#\_edn28]

The idea of an experimental shift is tied to an explicit desire to set artists' collectives 'outside the norm',[29].[#\_edn29].i.e. outside the established corporate and preservation frameworks, such as production companies and archival institutions. This opposition to consumer society and industrial-scale pollution was not just a Luddite regression or a reactionary lifestyle choice. Instead, they proposed what Jennifer Rauch defines as 'alternative media', i.e. collective, progressive solutions to the perceived cultural dominants.[30].[#\_edn30].This collective work could be seen through Zielinski's previously mentioned notion of *psychopathia medialis* and the media practices of resistance. As Chodorov notes discussing the proliferation of new film labs:

[t]he difference between those that are closing and the new ones opening is simple: the new ones are not for profit; they are run by artists. They are not out to make money with their labs; they are out to make films. Not only their own films; their goal is to open the doors to anyone who wants to work on film material, whether they are beginners or expert filmmakers, whether they make experimental films, contemporary art or performance pieces.[31].[#\_edn31]

The countercultural attitude includes a political approach to collective experiences (such as feminist and queer) as well as to technology. [32].[#\_edn32].The latter includes a rejection of industry-dictated technological change and an opposition to planned obsolescence.[33].[#\_edn33].This focus also troubles the assumption of a naturalised shift from industrial film labs to

the digital workflow desktop labs for postproduction, computer graphics, and VFX. Hence, the other side of the story of the industrial discontinuation of film stock – and how it becomes a focus of artistic work<sup>[34]</sup>,<sup>[#\_edn34]</sup>, such as Tacita Dean's – speaks to the counterculture of artist-run labs worldwide. According to Rey, 'as the moving picture industry gradually abandons the film medium, the equipment, the knowledge, the practices migrate into artists' hands',<sup>[35]</sup> <sup>[#\_edn35]</sup>. This migration becomes of special interest to media theorists and is itself one part of the countercultural strand.<sup>[36]</sup> <sup>[#\_edn36]</sup>. In Marcy Saude's words: '[t]he objects and machines that form node points around which the artist labs are organized move and have moved from the realm of commercial production into a de-commodified state where they are collectively owned.'<sup>[37]</sup> <sup>[#\_edn37]</sup>

It is not by chance that the rise of such labs, together with their idea of recovery of materials and equipment, took place in two main nodes of film history: the 1960s of collective film practices such as in film co-ops, and then again in the 1990s. The 1960s radical changes both in cinema and consumer culture – including the anti-consumerist movement<sup>[38]</sup> <sup>[#\_edn38]</sup> – has been matched since the 1990s by a significant transformation. The impact of digital technology on the media industry was met with interest in film and artistic work relating to obsolete forms and ideological discourses of old and new media, including Bruce Sterling's *Dead Media Project* as well as the field of media archaeology that partly emerged from the work of film studies and media art practitioners. In these years, many kinds of labs started to collect leftover artifacts and machinery from the industry, paralleling the work of practitioners and collectors such as Werner Nekes

and theorist-historians like Erkki Huhtamo. Many artist-run labs also spread a practice-based alternative sense of film culture: the establishment L'Abo, an international network of artist-run labs and a newsletter titled *L'ébouillanté*, aimed at sharing knowledge among such labs that included 'handy tips and bits of ads and advice, with each lab taking a turn in producing it'.<sup>[39]</sup><sup>[#\_edn39]</sup>

With some exceptions,<sup>[40]</sup><sup>[#\_edn40]</sup> the majority of the labs related to collectives: shared experiences strengthen shared values and identity, another cornerstone of countercultural communities,<sup>[41]</sup><sup>[#\_edn41]</sup> while trying to solve such issues as finding skilled technical expertise. Activities such as meetings and workshops were also tied together by newsletters, websites, social network groups, streaming channels of user-generated content, open source databases, etc., that demonstrated the hybrid nature of otherwise analogue practices embedded in the contemporary landscapes of digital communication, emphasising the nature of the post-digital, as noted above. Knowledge about material practices travelled online, connecting individual labs.

This hybridity of practices becomes one perspective to the so-called digital turn. Here the digital is not merely a technology of recording, projection, or even distribution, but the wider societal context in which film takes place – as a practice of sharing, epistemic considerations, collective work, and more. In this moment of technological transition, film scholars are redefining the conceptual issues related to film history after the digital. These issues involve not only the usual discourse of deaths, but the multiple rebirths and replacements. According to Francesco Casetti's argument about the 're-

location' of the cinematic medium, while the technical basis and the material conditions may impact a media experience, 'the experience can remain the same in some respects inasmuch as it conserves its form, its configuration', because it answers to an idea of cinema that emerges from habits and memories. Cinematic pasts become tightly embedded in the contemporary contexts of technology and experiences.[42].[#\_edn42]

The hybrid laboratories of creativity and preservation, of experimentation and research, demand labor-intensive processes and technicalities of photochemistry to the many other investments that are not merely technological. As Chodorov puts it: '[n]o services are offered at these labs: the filmmakers must come get their hands wet and do the work themselves, the more experienced members helping the neophytes.'[43].[#\_edn43]

### **Experimental media archaeology laboratories**

The laboratory is a vital node and infrastructure for artists' practice-based research, often functioning as an expanded workshop devoted to experiments, where creativity and technical knowledge are tightly meshed. Kelly Egan summarises it from her point-of-view as an experimental film maker:

[f]ilm labs are perhaps the most important elements of cinema's infrastructure. Labs stand at the threshold of the past, present and future of film. Labs are the heart of filmmaking, film distribution, film exhibition, and film preservation. How your lab operates effects the look of your film, and the longevity of the filmstrip (for instance, some printers are prone to certain colour choices, or if your filmstrip isn't washed or fixed properly, the

chemical composition will continue to change as it ages).[44].[#\_edn44]

In the context of film, laboratories are the historical technological backbone of the medium, but labs have become a central reference point – often also a metaphor – for recent media, arts, and humanities. The term ‘lab’ has been separated from its corporate and industrial legacy coming to stand alongside ‘studio’ in the contemporary imaginary as a situated space of knowledge creation.[45].[#\_edn45]. Institutionalised within universities and other sites, the lab has become the place where experimental practices and knowledge production define cultural narratives of creative media technologies. If such examples as the MIT Media Lab, Harvard’s metaLAB, and the Stanford Humanities Lab can be seen as part of the infrastructure of digital humanities and at times also the creative economy, the other side would then include media archaeology labs such as Berlin’s Media Archaeological Fundus, the Signal Laboratory, the Media Archaeology Lab at Boulder Colorado, and the eponymous lab at Bilkent University in Ankara. Furthermore, these grassroots-level artist-run film labs can be seen as a counterpoint to the more corporate large-scale beacons of new media culture that have branded the landscape of the audiovisual arts. The epistemological aspect of ‘hands-on’ persists as central to these media archaeological infrastructures.[46].[#\_edn46]

Artists’ film labs are founded on craftsmanship and artisanal practice. The engagement with the materiality of film offers a metacinematic reflection that is not merely nostalgic fetishism[47].[#\_edn47]. but an approach borrowed from the tradition of structural-materialist cinema[48].[#\_edn48]. and reframed as critical of technological obsolescence. Hence the

lab, as one part of the re-location of cinema, becomes the test facility for 'a variety of contemporary experimental film-making practices that celebrate, rather than lament, film as a living (and dying) body'[49].[#\_edn49].as it extends the research purposes of film archives.[50].[#\_edn50] According to the artist Esther Urlus, explaining the decision of many contemporary artists to stick with film:

[w]e are now at a time that alternative infrastructures and practices allows artists to control and reinvent every stage of the once-industrial process of production. The new sense of freedom and liberation to which this shift has given rise reframes film as a field of discovery, a photochemical playground that offers itself to the artist in the rawness and malleable nature of its physicality.[51] [#\_edn51]

While again acknowledging that labs come in many shapes and forms, we argue that labs act as sites of practice-based analysis of the materiality of media.[52].[#\_edn52].This becomes most explicitly articulated in the case of media archaeology labs, which establish hands-on practice as a way of formulating the complex temporalities of technical media. In this sense, the lesson of the experimental media archaeology developed by van den Oever and Fickers offers a useful methodological path, acknowledging re-enactments to experience the material constraints of media technologies. Fickers and van den Oever write that 'in engaging with the historical artifacts, we aim at stimulating our sensorial appropriation of the past and thereby critically reflecting the (hidden or nonverbalized) tacit knowledge that informs our engagement with media technologies'. [53].[#\_edn53].By producing experimental knowledge regarding past media use, the

experimenter co-constructs the medium as epistemic object. The lab becomes a stage for performing film history, by negotiating the space between preservation and experimentation in contemporary audiovisual culture.

We suggest that artist-run film labs not only introduce but constantly perform an alternative genealogy of media within the broad framework of visual arts. This genealogy resonates with how Erika Balsom argues that multiple media specificities disperse the notion of cinema across different distribution and exhibition structures, as alternate responses to the by now ubiquitous presence of digital media: '[w]hen celluloid returns as a prominent feature of gallery-based moving image practice in the 1990s, it is inextricably linked to the rhetoric of a "death of cinema" at the hands of a digital villain and, as such, engages in a rethinking of the medium specificity of film in relation to the calculation of the digital.'<sup>[54]</sup> [[#\\_edn54](#)]. Furthermore, the practices have their own international circuit of festivals dedicated to analog films – even countercultures: Mono No Aware (New York), Edinburgh International Film Festival, London Analogue Festival, Analogica (since 2013 in Bolzano, formerly in Rome), Les Inattendus (Marseilles), Analog Resistance Festival (Yverdon-les-Bains, Switzerland), Photoblog.hk (Hong Kong), Portland Unknown Film Festival, Process (Riga), Strictly Analog (Ljubljana), the Analog Pleasure section at Viennale (Vienna), the analog section at International Short Film Festival Oberhausen, Artifact Small Format Film Festival (Calgary), Winnipeg Underground Film Festival, Back to the Future: Project! (Rotterdam), and others. The artist-run labs play a role that extends art methods with films to practices and situations of the labor

of experimental film while also reaching out to public contexts of curating and screenings.

Such countercultures of the cinematic medium are in many ways less after the 'the essence' of cinema rather than its changing materiality across sites and infrastructures, mapping potential futures while performing alternative genealogies.

### **Chemistry as a site of archaeology of film**

Artist-run labs and film labs maintain and reinvent the legacy of photochemical practices. Here the material medium-specificities are a reminder of the industrial history of film as part of modern petrochemical culture, as Nadia Bozak has articulated.<sup>[55]</sup><sup>[#\_edn55]</sup> The knowledge about film chemistry, emulsions, and self-developed solutions can be read as part of a negotiation of the materiality and history of cinema hands-on. As Dagie Brundert articulates her own practice: '[w]ith analog filmmaking I come closer and deeper to the core, it's physical and chemical, it's silver salt and colour molecules.'<sup>[56]</sup><sup>[#\_edn56]</sup>

Here the historical specificity of film in relation to industrial modernity and the desire to surpass that specificity are negotiated in artist-run lab practices: history is performed, re-staged, and rearticulated in new infrastructural contexts. Besides examples from contemporary film practitioners, workshops such as the 'Maddox' seminar at L'Abominable allowed artists to explore and practice handmade emulsion recipes. The reference to the name of the physician Richard Leach Maddox, pioneer of photography, is also a symbolical reminder of practice-based experiments outside the industrial contexts.<sup>[57]</sup><sup>[#\_edn57]</sup>

Thus, references to chemistry and physicality are also ways to refer to film history; they are not



merely ahistorical physical constants, but about practices of how light is manipulated in artistic and industrial cultures.<sup>[58]</sup><sup>[#\_edn58]</sup> In other words, artists mobilise film history. This includes references to early avant-garde filmmaking and to the camera as a craftsman-like device, such as László Moholy-Nagy's *Light-Space Modulator* (1930). In addition, current experimental artists are interested in cameraless films from the past; techniques shift from being historical details to functioning as potential guidelines, with recursive links to the history of the avant-garde.<sup>[59]</sup><sup>[#\_edn59]</sup> In the essay 'Musica Cromatica' (1912), the Futurist Bruno Corra described the experiments carried out with his brother Arnaldo Ginna, furnishing evidence for their earliest abstract films, made by clear film leader handpainted with primary colours.<sup>[60]</sup><sup>[#\_edn60]</sup> For his *Le retour à la raison* (1923), Man Ray spliced some film strips with others he had shot earlier, including a 'rayograph' technique extended to moving images, by sprinkling salt and pepper onto one piece of film and pins onto another.<sup>[61]</sup><sup>[#\_edn61]</sup> In 1930, the avant-garde filmmaker Walter Ruttmann wrote about the importance of the laboratories within the film industry, emphasising the need for experimental departments that extend the range of possibilities of 'film as a form of expression'.<sup>[62]</sup><sup>[#\_edn62]</sup> Around the second half of the 1960s and the 1970s, Hollis Frampton, Paul Sharits, Carolee Schneemann, Peter Kubelka, Michael Snow, Ernie Gehr, and many others maintained a hands-on approach to film: they controlled the tasks typically left to the laboratories, claiming that the processes of treatment were an equally 'creative' moment. This way filmmakers could find their intimacy with the medium's materiality.<sup>[63]</sup><sup>[#\_edn63]</sup>



Fig. 1: A composite image of a section of *c: won eyed jail* (Kelly Egan, 2005), 35mm, colour, sound, 5 min. Courtesy of the artists. All rights reserved.

Such intimacy is evident in many examples from current experimental filmmakers and is embedded in their methodology. Kelly Egan explains her *won eyed jail* as 'at once a film and a quilt; it can be exhibited as a three-dimensional sculptural object (i.e., a quilt), or run through a projector and screened as a traditional film'.<sup>[64]</sup><sup>[#\_edn64]</sup> Egan sewed 35mm film (negatives and positives, stills and moving images) together with fishing wire, pushing the experimental material of the film somewhere between personal hands-on and the enabling infrastructure of the Niagara Custom Lab.<sup>[65]</sup><sup>[#\_edn65]</sup> Her ability to mix photochemical elements (photographic negatives and motion picture film) came from conversations with Sebastjan Hendrickson, the founder of Niagara Custom Lab. While a commercial lab, Niagara Custom lab encouraged artist development through dialogue and shared community workspace, where filmmakers could work on their films and engage in 'shop talk' in order to figure out ways to push the medium further. In addition to Egan's work, the embodied experience of engaging within a community of filmmakers through the lab is apparent in many of the films emerging from Niagara Custom Lab.

Construction of custom-made apparatuses can play a similar role as well, resonating with what later becomes coined in terms of maker culture in design and humanities.<sup>[66]</sup><sup>[#\_edn66]</sup> From the history of film and experimental practice, one finds ways to stretch the definition of 'making'. For instance, Paolo Gioli made his *Film Stenopeico (L'Uomo senza Macchina da Presa, 1973-1981-1989)* by building his own device, a 'pinhole camera', a small metal rod with holes that was pulled manually, without lenses or shutters or any kind of drives.<sup>[67]</sup><sup>[#\_edn67]</sup> As one sort of reverse engineering of the image-making

apparatus, he devised his images without a shutter or optical printers. The apparatus bypassed, and perhaps in some ways incorporated the lab in itself.[68].[#\_edn68] As one sort of a counterculture of preservation, the practice-based work pursued by artist-run labs deals with photochemistry and apparatuses as a specific cultural experience, becoming close to the practices of media archaeological art.[69] [#\_edn69]

In addition to the editing of recycled images like found footage and the recovery of obsolete equipment, many artists work with homemade substances as an alternative to industrially-produced chemicals; for instance, the 'caffenol', a coffee based developer, shared by the technical photochemistry class run by Scott Williams at the Rochester Institute of Technology.[70].[#\_edn70] The publicly-accessed recipe, whose main ingredients are coffee, soda, and vitamin C, has been refined over the years by the active networks of the labs' community that has found and published other recipes using tea, beer, wine, or mint. In light of the chemical toxicity of film and media industrial processes, caffenol is one of the attempts that this community pursues to reduce the impact of its art on the environment. It assumes an engaged 'eco-aesthetic',[71].[#\_edn71] where art practice can contribute to sustainable lifestyles. Filmmakers such as Kevin Rice, Robert Schaller, and Esther Urlus have engineered recipes of homemade film emulsions that can be used to cover washed filmstrips that have been recycled from previous uses. There are even artists who have replaced animal-based gelatin with cruelty-free recipes of collodion or agar-agar. Urlus consulted a wide range of technical manuals by the early nineteenth-century pioneers of photography that fed into a self-published book,[72].[#\_edn72]

which includes recipes of handmade silver gelatin emulsions and applied colours. Urlus carefully describes her endeavors and mistakes, provides a complete list of chemicals, dosage, and procedures while underlining how the aim is not to match Kodak's achievements nor repeat the years of hard work in the early days of the film stock industry. Urlus' *Konrad and Kurfurst* (2013-2014) was realised with a home-brewed emulsion made of gelatin, potassium bromide, and silver nitrate, while her *Chrome* (2013) pursues another research into colour inspired by the Autochrome process. Patented by the Lumière brothers in 1903, it used dyed potato starch as colour filters, for a layer-by-layer process.

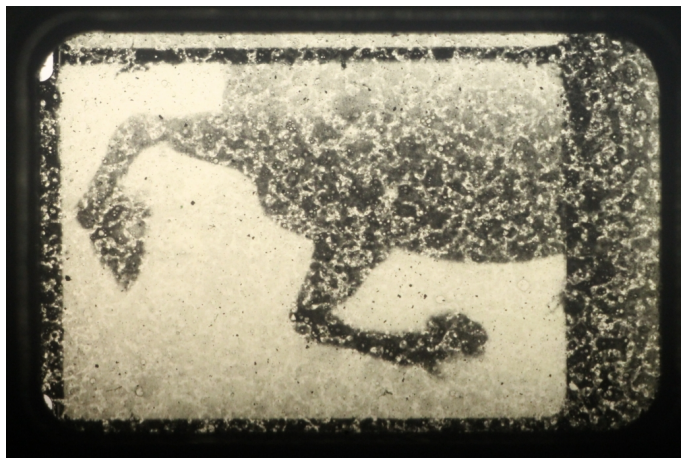


Fig. 2: Still frame from *Konrad & Kurfurst* (Esther Urlus, 2013-2014), 16mm, basic B&W emulsion (i.e. silver nitrate, potassium bromide, gelatin, water) with a few drops of pure alcohol, coated with a Revell airbrush, for model making. Courtesy of the artist. All rights reserved.

In addition to the use of caffenol, the British filmmaker Rosalind Fowler has explored organic elements for her *Tamesa* (2014), dedicated to the London Thames; a film section was processed in the river water, with all of its sediments and detritus becoming part of the film emulsion.

To conclude, this article has outlined various links between experimental practices from photochemistry to construction of apparatuses.

Those practices are often reliant on the infrastructure of the lab while also redefining – and sometimes rediscovering – other sites of the lab from the bathroom tub to the kitchen sink, including expanded ecologies such as river water as part of the fabrication of images. While a discussion of the ecologies of film is outside the scope of this article, we want to underline that the long legacy of the lab in film culture is also part of an environmental history of media.<sup>[73]</sup><sup>[#\_edn73]</sup> In this article, we have articulated labs as key nodes in the networks of experimental (film) practice, while briefly linking them to other terminologies of the lab and practice as they emerge in media archaeology and contemporary humanities infrastructure. The lab has now become at times synonymous with collective practices and sharing, as well as hands-on knowledge.

#### **Authors**<sup>[74]</sup><sup>[#\_edn74]</sup>

Rossella Catanese received her PhD at Sapienza University of Rome. Catanese collaborates with a research project on film and video archives with University of Milano-Bicocca. Her edited collection *Futurist Cinema: Studies on Italian Avant-garde Film* (2017) was published by Amsterdam University Press. She is also co-editor of *From Sensation To Synaesthesia in Film and New Media* (forthcoming) with Valentina Valente and Francesca Scotto Lavina.

Dr Jussi Parikka is Professor in Technological Culture & Aesthetics at University of Southampton, Winchester School of Art. He is the founding co-director of AMT, the Archaeologies of Media and Technology research unit. Parikka is the author of several books, including *What is Media Archaeology?* (2012), *A Geology of Media* (2015), *Digital Contagions* (2007, 2nd

edition 2016) and *Insect Media* (2010). With Joasia Krysa, he is the co-editor of *Writing and Unwriting (Media) Art History: Erkki Kurenniemi in 2048* (2015).

### Acknowledgements

The authors thank the anonymous peer reviews and the NECSUS editorial board for apt comments. We also thank professor Marta Braun for her meticulous reading and helpful feedback and Dr Kelly Egan for sharing her expertise.

### References

Balsom, E. *Exhibiting cinema in contemporary art*. Amsterdam: Amsterdam University Press, 2013.

Berry, D. and Dieter, M (eds). *Postdigital aesthetics: Art, computation and design*. Basingstoke: Palgrave, 2015.

Bordina, A. and Somaini, A (eds). *Paolo Gioli: The man without a movie camera*. Milan-Udine: Mimesis international, 2014.

Bozak, N. *The cinematic footprint: Lights, camera, natural resources*. New Brunswick: Rutgers University Press, 2011.

Beugnet, M. and Knowles, K. 'The aesthetics and politics of obsolescence. Hand-made film in the era of the digital', *The Moving Image Review & Art Journal*, Vol. 2, No. 1, April 2013: 54-65.

Casetti, F. 'The relocation of cinema', *NECSUS*, No. 2, Autumn 2012: 5-34.

Cavallotti, D. 'From grain to pixel? Notes on the technical dialectics in the small gauge film archive', *NECSUS*, Spring 2018: <https://necsus-ejms.org/from-grain-to-pixel-notes-on-the-technical-dialectics-in-the-small-gauge-film-archive/> [<https://necsus-ejms.org/from-grain-to-pixel-notes-on-the-technical-dialectics-in-the->

[small-gauge-film-archive/](#)](accessed on 11 October 2018).

Censi, R. *Copie originali. Iperrealismi tra pittura e cinema*. Milan: Johan & Levi Editore, 2014.

Cherchi Usai, P. *The death of cinema: History, cultural memory and the digital dark age*. London: British Film Institute, 2001.

Clayton, S. and Mulvey, L (eds). *Other cinemas: Politics, culture and experimental film in the 1970s*. London: I.B. Tauris, 2017.

Chodorov, P. 'The Artist-Run Film Labs', *Millennium Film Journal*, Vol. 60, Fall 2014: 28-36.

Corra, B. 'Musica Cromatica' in *Il pastore, il gregge e la zampogna*, edited by B. Corra and E. Settimelli. Bologna: Beltrami, 1912, reprinted in: M. Verdone. *Cinema e letteratura del futurismo*. Calliano, Trento: Manfrini, 1990: 242-253.

Cramer, F. 'What is "Post-Digital"?' in *Postdigital aesthetics: Art, computation and design*, edited by D. Berry and M. Dieter. Basingstoke: Palgrave, 2015: 12-26.

Cubitt, S. *The practice of light*. Cambridge: The MIT Press, 2014.

\_\_\_\_\_. *Finite media*. Durham: Duke University Press, 2016.

Duque, E. 'Celluloid and Self-Sufficiency: Artist-Run Labs', *CCCB Lab, Research and Innovation in the Cultural Sphere*, 23 February 2016: <http://lab.cccb.org/en/celluloid-and-self-sufficiency-artist-run-labs/> [<http://lab.cccb.org/en/celluloid-and-self-sufficiency-artist-run-labs/>](accessed on 11 October 2018).



Eizykman, C. *La jouissance-cinéma*. Paris: Union Générale d'Éditions, 1976.

Elsaesser, T. 'Media archaeology as symptom', *New Review of Film and Television Studies*, Vol. 14, No. 2, 2016a: 181-215.

\_\_\_\_\_. *Film history as media archaeology: Tracking digital cinema*. Amsterdam: Amsterdam University Press, 2016b.

\_\_\_\_\_. 'The Loop of Belatedness: Cinema After Film in the Contemporary Art Gallery', *Senses of Cinema*, Vol. 86, March 2018:  
<http://sensesofcinema.com/2018/cinema-and-the-museum/cinema-contemporary-art-gallery/>  
[<http://sensesofcinema.com/2018/cinema-and-the-museum/cinema-contemporary-art-gallery/>]  
(accessed on 11 October 2018).

Espinosa, J.G. 'Meditations on imperfect cinema... Fifteen years later', *Screen*, Vol. 26, Nos. 3-4, 1985: 93-94.

Fave, A. and Carquille, E. 'We remember', *L'Abominable*, 2013: [http://www.l-abominable.org/en/history/a-traduire-en-en\\_us-de-laboratorio/](http://www.l-abominable.org/en/history/a-traduire-en-en_us-de-laboratorio/) [[http://www.l-abominable.org/en/history/a-traduire-en-en\\_us-de-laboratorio/](http://www.l-abominable.org/en/history/a-traduire-en-en_us-de-laboratorio/)] (accessed on 11 October 2018).

Fickers, A. and van den Oever, A. 'Experimental Media Archaeology: A Plea for New Directions' in *Techné/technology: Researching cinema and media technologies, their development, use and impact*, edited by A. van den Oever. Amsterdam: Amsterdam University Press, 2013: 272-278.

Fossati, G. and van den Oever, A. 'Introduction: Exposing the Film Apparatus' in *Exposing the film apparatus: The film archive as a research laboratory*, edited by G. Fossati and A. Van den

Oever. Amsterdam: Amsterdam University Press, 2016: 13-42.

Gaudreault, A. and Marion, P. *The end of cinema?: A medium in crisis in the digital age*. New York: Columbia University Press, 2015.

Gidal, P. 'Theory and definition of structural/materialist film' in *Structural film anthology*. London: BFI, 1976: 1-21.

Hagener, M. *Moving forward, looking back: The European avant-garde and the invention of film culture, 1919-1939*. Amsterdam: Amsterdam University Press, 2007.

Hellmann, K-U. and Luedicke, M.K. 'The Throwaway Society: a Look in the Back Mirror', *Journal of Consumer Policy*, Vol. 41, No. 1, March 2018: 83-87.

Hertz, G. and Parikka, J. 'Zombie Media- Circuit Bending Media Archaeology into an Art Method', *Leonardo*, Vol. 45, No. 5, 2012: 424-430.

Knowles, K. *A cinematic artist: The films of Man Ray*. Oxford: Peter Lang, 2012.

\_\_\_\_\_. 'Blood, sweat, and tears. Bodily inscriptions in contemporary experimental film', *NECSUS*, Vol. 2, No. 2, Fall 2013: 447-463.

\_\_\_\_\_. 'Self-Skilling and Home Brewing: Some Reflections on Photochemical Film Culture', *Millennium Film Journal*, Vol. 60, Fall 2014: 20-27.

\_\_\_\_\_. 'Slow, Methodical, and Mulled Over: Analog Film Practice in the Age of the Digital', *Cinema Journal*, Vol. 55, No. 2, Winter 2016: 146-151.

Krysa, J. 'The Politics of Contemporary Curating. A Network Perspective' in *The Routledge companion to art and politics*, edited by R. Martin. London-New York: Routledge, 2015: 114-121.

Latour, B. 'Give Me a Laboratory and I Will Raise the World' in *Science observed: Perspectives on the social study of science*, edited by K. Knorr-Cetina and M. Mulkey. London: Sage, 1983: 141-170.

Lippit, A.M. *Ex-cinema: From a theory of experimental cinema and film*. Berkeley: University of California Press, 2012.

Martin, N. 'Pratique des émulsions artisanales', *La furia umana*, Vol. 33, February 2018:  
<http://www.lafuriaumana.it/index.php/66-archive/lfu-33/767-noelie-martin-pratique-des-emulsions-artisanales>  
[<http://www.lafuriaumana.it/index.php/66-archive/lfu-33/767-noelie-martin-pratique-des-emulsions-artisanales>](accessed on 11 October 2018).

Maxwell, R. and Miller, T. *Greening the media*. Oxford: Oxford University Press, 2012.

Mekas, J. 'The First Statement of the New American Cinema Group' in *Film culture reader*, edited by P. Sitney. London: Secker & Warburg, 1971 (originally published in *Film Culture*, Vol. 22-23, 1961).

Miles, M. *Eco-aesthetics: Art, literature and architecture in a period of climate change*. London: Bloomsbury, 2014.

Parikka, J. *What is media archaeology?* Cambridge: Polity, 2012.

\_\_\_\_\_. *A geology of media*. Minneapolis: University of Minnesota Press, 2015.

\_\_\_\_\_. 'The Lab Imaginary: Speculative Practices in Situ' in *Across & beyond: A transmediale reader on post-digital practices, concepts and institutions*, edited by R. Bishop, K. Gansing, J. Parikka, and E. Wilk. Berlin: Sternberg Press, 2016: 76-99.

Pope, K (ed.). *Understanding planned obsolescence: Unsustainability through production, consumption and waste generation*. London: Kogan, 2017.

Rauch, J. 'Slow Media as Alternative Media. Cultural resistance through print and analogue revivals' in *The Routledge companion to alternative and community media*, edited by C. Atton. London-New York: Routledge, 2015: 571-581.

Rey, N. 'Artist-run film labs: an historical perspective' in *filmlabs.org*, April 2009: <http://www.filmlabs.org/index.php/texts/reyl> [<http://www.filmlabs.org/index.php/texts/reyl/>] (accessed on 11 October 2018).

\_\_\_\_. 'De la cave aux cuisines' in *L'abominable*, 2014: <http://www.l-abominable.org/historique/de-la-cave-aux-cuisines/> [<http://www.l-abominable.org/historique/de-la-cave-aux-cuisines/>] (accessed on 11 October 2018).

Roszak, T. *The making of a counter culture: Reflections on the technocratic society and its youthful opposition*. New York: Anchor Books, 1969 (original edition 1968).

Ruttman, W. 'Technik und Film' in *Kunst und Technik*, edited by L. Kestenberg. Berlin: Wegweiser, 1930: 325-331, reprinted in: J. Goergen (ed.). *Walter Ruttmann. Eine Dokumentation*. Berlin: Freunde der Deutschen Kinemathek, 1989: 87-89.

Saude, M. 'Old Weird Materialism: Production and Distribution of Photochemical Artist Film', paper presented at *NECS 2018 conference: Media Tactics and Engagement*, University of Amsterdam, 29 June 2018.

Sayers, J (ed.). *Making things and drawing boundaries: Experiments in the digital humanities*. Minneapolis: University of Minnesota Press, 2017.

Strauven, W. 'Media Archaeology: Where Film History, Media Art and New Media (Can) Meet' in *Preserving and exhibiting media art: Challenges and perspectives*, edited by J. Noordegraaf, C. Saba, B. Le Maitre, and V. Hediger. Amsterdam: Amsterdam University Press, 2013: 59-79.

Thouvenel, E. and Contant, C (eds). *Fabriques du cinéma expérimental*. Paris: Paris Expérimental, 2014.

Urlus, E. *Re:inventing the pioneers: Film experiments on handmade silver gelatine emulsion and color methods*. Rotterdam: self-published, 2016.

Venturini, S. and Santi, M. 'The History and Technological Characteristics of Cinematographic Production and Reception Device' in *Preserving and exhibiting media art: Challenges and perspectives*, edited by J. Noordegraaf, C. Saba, B. Le Maitre, and V. Hediger. Amsterdam: Amsterdam University Press, 2013: 203-216.

Venturini, S. 'Learn then Preserve', *Synoptique*, Vol. 6, No. 1, Fall 2017:  
<http://synoptique.hybrid.concordia.ca/index.php/main/art>  
[<http://synoptique.hybrid.concordia.ca/index.php/main/ar>  
(accessed on 11 October 2018).

Williams, S. 'A Use for that Last Cup of Coffee: Film and Paper Development', 1995:  
<https://people.rit.edu/andpph/text-coffee.html>  
[<https://people.rit.edu/andpph/text-coffee.html>]  
(accessed on 11 October 2018).

Woloshen, S. *Recipes for reconstruction*. Montreal: Scratchatopia Books, 2010.

\_\_\_\_. *Scratch, crackle & pop!* Montreal: Scratchatopia Books, 2015.

Yue, G. 'Kitchen Sink Cinema: Artist-Run Film Laboratories', *Film Comment*, 30 March 2015: <http://www.filmcomment.com/blog/artist-run-film-laboratories/> [<http://www.filmcomment.com/blog/artist-run-film-laboratories/>] (accessed on 11 October 2018).

Zielinski, S. *Deep time of the media: Toward an archaeology of hearing and seeing by technical means*. Cambridge-London: The MIT Press, 2006.

## Websites

<http://www.handmadefilm.org/research/tiki-index.php> [<http://www.handmadefilm.org/research/tiki-index.php>] (accessed on 11 October 2018).

<https://yumyumsoups.wordpress.com/> [<https://yumyumsoups.wordpress.com/>] (accessed on 11 October 2018).

<http://www.filmlabs.org/index.php/site/home/> [<http://www.filmlabs.org/index.php/site/home/>] (accessed on 11 October 2018).

<http://www.re-mi.eu/> [<http://www.re-mi.eu/>] (accessed on 11 October 2018).

<http://whatisamedialab.com> [<http://whatisamedialab.com>] (accessed on 11 October 2018).

---

[1].[#\_ednref1] Zielinski 2006, p. 8.

[2].[#\_ednref2] Berry & Dieter 2015; Bishop & Gansing & Parikka & Wilk 2016.

[3].[#\_ednref3].Cramer 2015, p. 13.

[4].[#\_ednref4].Claudine Eizykman refers to experimental in antithesis to 'Cinéma NRI', i.e. the Narrative-Representational-Industrial cinema. Eizykman 1976, p. 10.

[5].[#\_ednref5].Cf. Lippit 2012.

[6].[#\_ednref6].Genevieve Yue (2015) explains: '[t]he most distinctive quality about the current artist-run lab movement is the international circuit that sustains it. In its current manifestation, the artist-run film lab can be both an autonomous unit in Toronto (Niagara Custom Lab [<http://niagaracustomlab.com/>]), Seoul (Space Cell [<http://spacecell.tumblr.com/>]), Bogota (Kinolab [<http://kinolabcolombia.blogspot.com/>]), or other locales, and a satellite attached to an international network. [...] These collective dimensions are both political and practical.'

[7].[#\_ednref7].See also Strauven 2013.

[8].[#\_ednref8].This idea about cinema and film as a multitude of past and future potentials resonates with Elsaesser's (2016b) focus on media archaeology.

[9].[#\_ednref9].On care and curating, see Krysa 2015.

[10].[#\_ednref10].See the What is a Media Lab research project at <http://whatisamedialab.com> [<http://whatisamedialab.com>]. Cf. Parikka 2016.

[11].[#\_ednref11].Fickers & van den Oever 2013.

[12].[#\_ednref12].Referring to Josh Lewis' (Negativland Lab) words, quoted in Yue 2015.

[13].[#\_ednref13].Yue 2015.

[14].[#\_ednref14].Rey 2014.

[15].[#\_ednref15].Rey 2009.

[16].[#\_ednref16]. Josh Lewis (Negativland Lab) quoted in Yue 2015.

[17].[#\_ednref17]. Hertz & Parikka 2012.

[18].[#\_ednref18]. Cherchi Usai 2001, p. 67.

[19].[#\_ednref19]. Gaudreault & Marion 2017, p. 121.

[20].[#\_ednref20]. Fossati & Van Den Oever 2016, p.27.

[21].[#\_ednref21]. Guy Edmonds, email interview with Rossella Catanese, 11 July 2018.

[22].[#\_ednref22]. See for example La Camera Ottica lab, film and video restoration laboratory, at University of Udine (in Gorizia's branch). Venturini 2017; Cavallotti 2018.

[23].[#\_ednref23]. Knowles 2013, p. 447.

[24].[#\_ednref24]. Knowles 2016, p. 147.

[25].[#\_ednref25]. Yue 2015.

[26].[#\_ednref26]. 'We are not joining together to make money. We are joining together to make films... We don't want rosy films, we want them the color of blood.' Mekas 1971 [orig. in 1961], quoted in Chodorov 2014, p. 29.

[27].[#\_ednref27]. The equipment of the London Filmmakers' Cooperative is currently based at no.w.here lab.

[28].[#\_ednref28]. Cuban film director Julio Garcia Espinosa's 1969 manifesto 'For an Imperfect Cinema' proposed cinema as an engaged and 'imperfect' activity against an 'economy of waste'. Espinosa 1985, p. 94.

[29].[#\_ednref29]. Duque 2016.

[30].[#\_ednref30]. Rauch 2015, p. 572.



[31].[#\_ednref31].Chodorov 2014, p. 29.

[32].[#\_ednref32].Clayton & Mulvey 2017.

[33].[#\_ednref33].Pope 2017.

[34].[#\_ednref34].Elsaesser 2018.

[35].[#\_ednref35].Rey 2009.

[36].[#\_ednref36].It is however important to note that it is not possible to brand all labs and related centres as countercultural; the field and its institutional ties are more complex than organised around the binary of dominant vs. countercultural.

[37].[#\_ednref37].Saude 2018.

[38].[#\_ednref38].Hellmann & Luedicke 2018.

[39].[#\_ednref39].Fave & Carquille 2013.

[40].[#\_ednref40].Dagie Brundert shares practices and recipes on analog filmmaking on her blog. 'I tested recipes, colour and black & white, negative and positive, regular and non-poisonous first in my bathroom, now in my atelier, posted all the results online, spread my experiences into the world (wide web) and by now I have become a lab that also develops for other people in need [...] Labs are fruitful and prolific because they love what they do, they are open and they share. It doesn't have anything to do with profit, competition that we are all so tired of in turbocapitalism.' Dagie Brundert, email interview received by Rossella Catanese on 12 July 2018.

[41].[#\_ednref41].Roszak 1968.

[42].[#\_ednref42].Casetti 2012, p. 27.

[43].[#\_ednref43].Chodorov 2014, p. 29.

[44].[#\_ednref44].Kelly Egan, email interview received by Rossella Catanese on 10 July 2018.

- [45].[#\_ednref45].Parikka 2016.
- [46].[#\_ednref46].Ibid. On making, see Sayers 2017.
- [47].[#\_ednref47].See Yue 2015.
- [48].[#\_ednref48].Gidal 1976.
- [49].[#\_ednref49].Beugnet & Knowles 2013, p. 56.
- [50].[#\_ednref50].Fossati & van den Oever 2016.
- [51].[#\_ednref51].Esther Urlus, email interview received by Rossella Catanese on 16 July 2018.
- [52].[#\_ednref52].Latour 1983, p. 165.
- [53].[#\_ednref53].Fickers & van den Oever 2013, p. 273.
- [54].[#\_ednref54].Balsom 2013, p. 24. See also Elsaesser 2016a, p. 200.
- [55].[#\_ednref55].Bozak 2011.
- [56].[#\_ednref56].Dagie Brundert, email interview received by Rossella Catanese on 12 July 2018.
- [57].[#\_ednref57].On Maddox, see Martin 2018.
- [58].[#\_ednref58].See Cubitt 2014.
- [59].[#\_ednref59].‘The idea of art as a laboratory is one key to understanding the avant-garde. In this perspective the artist becomes a scientist and engineer setting up parameters and experiments for testing out results: the work of art becomes a test arrangement, not unlike in a scientific series of experiments.’ Hagener 2007, p. 13.
- [60].[#\_ednref60].Corra 1912.
- [61].[#\_ednref61].See Knowles 2012, p. 58.
- [62].[#\_ednref62].See Ruttmann 1930, p. 327.
- [63].[#\_ednref63].Censi 2014, p. 51.

[64].[#\_ednref64]. Kelly Egan, email interview received by Rossella Catanese on 10 July 2018.

[65].[#\_ednref65]. Ibid.

[66].[#\_ednref66]. See Sayers 2017.

[67].[#\_ednref67]. See Bordina & Somaini 2014.

[68].[#\_ednref68]. Besides cameraless cinema, many artists work with found footage and archival cinema, using existing film materials that methodologically links to the avant-garde tradition of photomontage. Venturini & Santi 2013, p. 207.

[69].[#\_ednref69]. On media archaeological art practices, see Parikka 2012, pp. 136-158.

[70].[#\_ednref70]. Williams 1995.

[71].[#\_ednref71]. Miles 2014.

[72].[#\_ednref72]. Urlus 2016.

[73].[#\_ednref73]. See Bozak 2011; Maxwell & Miller 2012; Parikka 2015; Cubitt 2016.

[74].[#\_ednref74]. The article has been written collaboratively between the authors. For the purposes of the Italian academic system, we want to identify that the first and fourth sections are written by Jussi Parikka while the second, third, and fifth ones are by Rossella Catanese.

