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Cinema and Mid-Century Colour Culture

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Beyond Cinema

Cinema and Mid-Century Colour Culture: An Introduction

Elena Gipponi, Università IULM, Milano
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> We have confused the factory-made color world around us in our rooms and magazines no less than on our bodies with the colors in nature, parallel to the way we have confused a photograph with reality.
>
> (Michael Taussig, 'What Color Is the Sacred?')

Some of the most popular, online clickbait articles are photographic galleries that call attention to the chromatic quality of the historical images: for instance, collections of archival colour photographs and footage from the mid-century — often war scenes ('WWII in Colour'), or ordinary snapshots ('Everyday Life in Germany after the War') — are displayed in sensuous tones. What is appealing about these various compilations is that they reveal in *colour* a past usually thought and represented in the antique shades of black and white. In some cases, these are dealing with original colour documents, rediscovered and valorised precisely by virtue of the exceptional presence of such indexical hues resurfacing from the past. In other cases, the attention-getting aspect is, conversely, the digital colourisation of archival images originally achromatic, now retouched by amateur historians and graphic designers through digital software as part of the 'Colorized History' fad. Whether these colours are original or retouched, such examples bear witness to the renewed interest in historical colour in contemporary visual culture, undoubtedly prompted by the possibilities of manipulation and simulation offered by digital technologies that allow one to reproduce with a high degree of verisimilitude all the styles and chromatic regimes of the past. This special issue of *Cinéma&Cie* aims to address colour at mid-century as an *analogue* quality of still and moving images and, more broadly, of the intermedial cultures in which cinema was embedded. The central decades of the last century are our focus, as this is when colour gradually became the norm, and the films and media from the era, like these various clickbait articles, track this transition, formally as well as culturally.

Another aspect of our focus on mid-century colour history, as outlined across the following articles, is to think through the usefulness of cultural and technical watersheds for assessing film and media history. Just as popular fascination with the analogue colours of the past has surged, so too has scholarly interest. Recent

attention to historical transformations in colour's apparatus has been informed by the pervasive changes wrought by digital technologies to our chromatic palettes. But such renovations are not without precedent, as the history of colour cinema demonstrates. Frequently in film history, technical changes have led to shifts in colour style that are simultaneously cyclical and transformative. The very emergence of cinematic technology in the late nineteenth century led to a surge of colourful attractions in some of the earliest moving images, from the applied-colour hues of Annabelle Whitford's serpentine dance films to the prismatic splendour of Georges Méliès and Segundo de Chomón's magical trick and fairy films. Yet, the brightly, saturated aniline dyes used in these films were subsequently restrained and integrated into narrative and nonfiction filmmaking at the end of the first decade of the 1900s, as new modes of unobtrusive style developed, and bourgeois taste cultures grew prominent. Following the First World War, changes in the international colourant industry as well as the increased professionalization of laboratory research were crucial for the thriving chromatic culture of the 1920s in film and related media. These developments drove a colour revolution that enabled Technicolor's international rise, in fits and starts, to prominence. The three-strip innovations of the Technicolor Corporation in the 1930s led to an initial era of colourful experimentation and demonstrative design. This was followed by the normalisation of colour style into the genre system of classical cinema, relegating the technology as a significant but minor practice (compared to black-and-white production) that was primarily used in musicals, melodramas, and historical dramas. Such generic uses of colour held sway until after World War II, when advances in technologies such as Eastmancolor mainstreamed colour as the dominant mode of filmmaking in post-war cinemas around the world. As Scott Higgins's exemplary work on Technicolor in the 1930s has shown, technical watersheds thus often lead to an initial phase of vivid experimentation that is followed by a process of normalisation into existing, typically classical stylistic practices.[1]

In terms of watersheds then, the mid-century is a period in colour cinema history bookended by the stylistic normalisation of Technicolor into narrative cinema and subsequently by the adoption and transformative uses of Eastmancolor in post-war cinemas, with many other competing, international technical systems overlapping along the way (e.g. Agfacolor, Ferraniacolor, Fujicolor, Orwocolor, Sovcolor). Profoundly significant in this trajectory was the emergence of colour television internationally in the post-war era, which followed a separate, though intersecting, technical genealogy from film colour, as Susan Murray's remarkable *Bright Signals: A History of Color Television* delineates (reviewed in this issue by Doron Galili).[2] The ongoing development of these media helped define

[1] Scott Higgins, *Harnessing the Technicolor Rainbow: Color Design in the 1930s* (Austin: University of Texas Press, 2007).
[2] Susan Murray, *Bright Signals: A History of Color Television* (Durham and London: Duke University Press, 2018).

the chromatic landscape at mid-century, particularly during post-war boom of consumption, youth cultures and international new wave movements.

Change, however, is also gradual in ways not easily captured through a focus on technical breakthroughs and firmly fixed historiographic eras. This is why we take an expansive view of the mid-century, to account better for the cultural and intermedial currents that shaped cinematic colour as well as the asymmetrical flows of global media cultures. Beyond such technical and stylistic points of navigation, what the articles collected here also delineate is the broad, contextual developments that shaped cinema during the era. Watersheds do not occur in a vacuum, and for historiography it is necessary to take into account the media archaeological systems that enable technical and aesthetic change. For colour at mid-century, these systems are numerous and require a multidisciplinary approach. Indeed, colour has been examined in various disciplines, from physics to chemistry, from biology to neurology, and of course in art history and aesthetic theory.

In particular, colour in audio-visual image studies most often draws on four main interpretative points of focus: perception, technology, aesthetics and culture. Proceeding backwards from the last dimension, colour is indeed a social and cultural phenomenon, charged with linguistic-aesthetic values: for example, its representational relation as it becomes normalised at mid-century to truth and reality or, conversely, to fantasy and daydreams.[3] Every chromatic language and style, in turn, is inseparable from techniques and technologies (e.g. applied colour produces a different effect if compared to photochemical processes such as Eastmancolor). By virtue of technology, moreover, the spectators' senses are solicited, and their perception is affected by and contributes to colour culture on a social level, in an inexhaustible circle of reciprocal mediations and influences. As Edward Branigan maintains in his recent philosophical overview of colour in cinema and art, 'Color is relational. […] Color is not a purely objective phenomenon determined by a light meter, but rather the result of many interacting systems'.[4] Such concern for the relational nature of colour is shared, in different ways, by the majority of research on cinematic colour that has burgeoned since the second half of the 2000s, particularly for those dealing with a *contextual* perspective that is attentive to the relations of a given colour film (or corpus of films) with its surrounding visual culture.[5] Indeed, this is exactly what the essays collected here do: while not renouncing close analysis and the decoding of colour's symbolic meanings in the examined works, each keep an open outlook

[3] On the history of the cultural and symbolic meanings of colours see in particular the work of Michel Pastoureau, from *Dictionnaire des couleurs de notre temps. Symbolique et société* (Paris: Bonneton, 1992) onwards.

[4] Edward Branigan, *Tracking Color in Cinema and Art: Philosophy and Aesthetics* (New York: Routledge, 2017), pp. xxi-xxii.

[5] See at least Richard Misek, *Chromatic Cinema: A History of Screen Color* (Malden, MA: Wiley-Blackwell, 2010) and Paul Coates, *Cinema and Colour: The Saturated Image* (London: BFI Palgrave, 2010).

on the socio-cultural and intermedial environment in which colour circulated at mid-century, never forgetting the relationship between colour technologies and the subjects who use them.

Such renewed interest in technological devices and their impact on spectatorship is grounded in the more general trend of the new film history inaugurated in the late 1970s. This historiographic practice turned the focus from the 'inventor-as-hero' narrative to the social uses of technologies, and from the single artist's personal expression to the minor and lowbrow, and often anonymous, cinematic practices. While a great deal of research on cinematic colour has been devoted to the silent era,[6] this special issue aims to expand the time span of scholarship on the history of colour cinema. As mentioned, the mid-century is an expansive era lasting broadly from the late 1930s through the 1960s and beyond. Photographic colour systems dramatically transformed cinematic practice — from musicals and melodramas, to animation, experimental, and amateur cinemas — and led to the eventual normalisation of colour over black-and-white cinema around the world. In many ways, this transformation is difficult to observe, as colour was increasingly common and ordinary, even banal and unobtrusive as a visual quality that was experienced in mid-century media increasingly as *natural*.

The dialectics between naturalness and artificiality and between transparency and opacity have long been operating in colour studies, particularly in those inquiries dealing with colour from an aesthetic standpoint. Research of this kind often distinguishes two differing modes of colour appearance: on the one hand, colour in a film can be used as a thing, in and of itself, a pictorial resource that tends to abstract and detach itself from the diegetic objects and surfaces through which it becomes visible. In this way, colour can be perceived as a quality of its own, simply as colour. For instance, this is what happens often in the work of Japanese director Suzuki Seijun, whose chromatic design — from vibrant solid colours to sudden colour shifts — is analysed by William Carroll in the first essay of this special issue, 'The History of a Broken Blue *Fusuma*: Colour in Suzuki Seijun's Nikkatsu Films'. While delineating Suzuki's remarkable and idiosyncratic approach to colour in the 1960s, Carroll also carefully situates his practice within the colour style of the Nikkatsu studio he was working in. On the other hand, colour in films can operate in an opposite mode: as unobtrusive, seemingly invisible, as in most cases, particularly as colour becomes the norm at mid-century. Colour is everywhere, but, because of its pervasiveness, it tends to go unperceived as an expected and insignificant property of visual representation. The co-authored essay 'From the Margins to the Mainstream?

[6] See the groundbreaking collection *'Disorderly Order': Colours in Silent Film — the 1995 Amsterdam Workshop*, ed. by Daan Hertogs and Nico de Klerk (Amsterdam: Stichting Nederlands Film Museum, 1996); Joshua Yumibe, *Moving Color: Early Film, Mass Culture, Modernism* (New Brunswick, NJ: Rutgers University Press, 2012); Giovanna Fossati and others, *Fantasia of Color in Early Cinema* (Amsterdam: Amsterdam University Press, 2015); and the recent Sarah Street and Joshua Yumibe, *Chromatic Modernity: Color, Cinema, and Media of the 1920s* (New York: Columbia University Press, 2019).

The Eastmancolor Revolution and Challenging the Realist Canon in British Cinema' by 'The Eastmancolor Revolution and British Cinema' research team — Sarah Street, Keith M. Johnston, Paul Frith, Carolyn Rickards — aims precisely to uncover the assumed invisibility of colour in British film history, particularly when dealing with Eastmancolor filmstock as opposed to the more celebrated Technicolor dye-transfer productions. Privileging lesser-known colour films over now canonical masterpieces (e.g. the works of Powell and Pressburger), the essay proves how the hitherto neglected and 'transparent' presence of colour unexpectedly activated an inner remodelling within certain popular genres of British film production, such as social realist documentary, horror, comedy and the biopic.

Beyond the historical and aesthetic perspective, the same dialectic between opacity and transparency is at work if we consider colour as an integral part of the cinematic apparatus. The methodological claims of apparatus theory, which has been a renewed topic of interest in contemporary media studies, are thus suitable also for our topic. Colour can be approached as a foundational element of the cinematic apparatus at mid-century, particularly given its capacity to negotiate between the binaries of transparency and opacity. The opposition of these binaries engages the apparatus in an ideological sense: far from being neutral, or natural, colour technology is inscribed with a range of social values and cultural desires. For instance, 'chromophobia' — which considers bright and saturated colours as the taste prerogatives of subaltern subjectivities (e.g. women, children, gays and poor immigrants) — circulates discursively in much of the reception of new colour technologies throughout the twentieth century.[7] From a technological point of view, one of the main ideologies that colour sustains is that of *newness*. At least until the 1960s, colour images were deemed as state-of-the-art modes of display within modern visual culture, even if this supposed newness was in some cases clichéd and commonplace — 'tired', as Erkki Huhtamo and Jussi Parikka maintain: 'the new is "dressed up" in formulas that may be hundreds of years old, while the old may provide "molds" for cultural innovations and reorientations'.[8] This is one of the challenging assertions of the methodology of media archaeology, and it is fruitful for the study of mid-century colour. The *newness* of post-war colours can in fact be traced back before World War II. As a matter of fact, many of the following essays locate in the 1930s the groundwork of colour theories and practices that dominated the following decades. Kirsten Thompson's article, 'The Colour Revolution: Disney, DuPont and Faber Birren', in particular, addresses the material relationship in the 1930s between the DuPont chemical conglomerate and the Disney studio, which was supplied by DuPont with key raw materials for its cel animation. By doing this,

[7] See the well-known study of David Batchelor, *Chromophobia* (London: Reaktion, 2000).
[8] Erkki Huhtamo and Jussi Parikka, 'Introduction: An Archaeology of Media Archaeology', in *Media Archaeology: Approaches, Applications, and Implications*, ed. by Huhtamo and Parikka (Berkeley: University of California Press, 2011), p. 14.

Thompson's essay proves to be, among other things, a rich media-archaeological exploration that digs into the very materiality of the cinematic apparatus: she considers colour as a material substance and a technological device, as hardware (*l'appareil de base*, according to Baudry).

Thompson's essay deals also with principles of colour aesthetic design, referring to the theoretical and practical work of colour engineers and colour consultants such as Howard Ketcham and Faber Birren, the latter being the champion of so-called 'functional colour'.[9] Developed conceptually in the 1930s, functional colour sought ways to best instrumentalise it through effective design and conventional associations between hues and human actions and reactions, as in 'red stands for alert, green stands for rest'. By adhering to functional principles, colour in design can achieve efficiently a wide range of objectives: increasing sales, reducing stress, directing attention in factories. Functional colour is a pivotal reference in mid-century colour practice, and it is a reference in several other articles collected here. In Federico Pierotti's 'Biopolitics of Colour in Mid-Century Italian Visual Culture: *Red Desert* and the "New Techniques of Life"', functional colour is considered as a biopolitical tool in a Foucauldian sense. In the context of Italian mid-century visual culture, functional approaches to colour were developed through a series of practices and discourses intended to regulate the biological aspects of human life, shaping viewers' perceptions and conditioning their moods, both at home and at work. Pierotti, nevertheless, locates in Antonioni's attention to colour in *Red Desert* (1964) a critical resistance against the attempted biopolitical automation of the Italian subject of the 1950s and the 1960s.

Also taking up functional colour, Justus Nieland examines its relation to the pedagogical and communicative work pursued in the Chicago School of Design (initially founded as the New Bauhaus in 1937), in the essay 'Colour Communications: László Moholy-Nagy, Walter Paepcke, and the Humanities Program of *Design Workshops*'. Nieland examines colour in relation to the 16mm Kodachrome films collected as *Design Workshops* (1940–1944), which László Moholy-Nagy directed in collaboration with his students at the School. As Nieland delineates, this collection of nontheatrical films fulfilled a number of tasks for the School: documenting its experimental, multimedia pedagogy, which dealt extensively with colour and new materials; training students in the use of the colour filmstocks and cinematic techniques; and last but not least, outwardly promoting the School's activities — hinging in part on the allure of colour film — to raise funds from corporate sponsors and philanthropic sources such as Rockefeller Foundation. Across this work, Moholy-Nagy was invested in the functional aspects of colour and design, yet he took these up at the School as part of a broader, vanguard vision of an arts and humanities pedagogy that sought to inculcate new forms of democratic and creative subjectivities for the new post-war world.

[9] See Faber Birren, *Functional Color* (New York: The Crimson Press, 1937).

In wider terms, the struggle at the centre of functional colour — between attempts to control colour and its own autonomous resistance to regulation — has historically spanned colour theory. It reaches back, for instance, to Newton and Goethe's dispute about colour's nature: can it be rationally studied and controlled as an optical aspect of light, or is it best understood as a complex and sprawling physiological phenomena? Focusing on mid-century colour, we can ascribe to the latter — colour's autonomy — the many examples of psychedelic colours analysed by Bregt Lameris in 'Hallucinating Colours: Psychedelic Film, Technology, Aesthetics and Affect'. With particular emphasis on Roger Corman's *The Trip* (1967), Lameris discusses the variety of attempts to liberate colour and celebrate its subversive and countercultural power during the psychedelic, LSD heyday of the 1960s.

Perhaps it should be no surprise that in the decade in which colour became the cinematic norm on global screens, the wild countercultural experimentation around colour expanded what normative colour might look like and how it might function and be received. Even as the vibrant hues found at the close of the mid-century marked a new watershed in colour practice, it is true also that they returned to one of the founding associations of colour, that of the Greek *pharmakon*, the pharmacy where both colours and drugs were synthesized.[10] Even as industrially-produced colour was naturalized at mid-century, it bore within it the illusory and autonomous powers that have always defined our mediated access to it. Thus, even 'natural' colours and dyes in cinema have always been in a sense culturally conditioned, artificial, synthetic, in other words an apparatus.

[10] See Jacques Derrida, 'Plato's Pharmacy', in *Disseminations* (London: Athlone Press, 1981), pp. 61–172.

The History of a Broken Blue *Fusuma*: Colour in Suzuki Seijun's Nikkatsu Films

William Carroll, University of Chicago

Abstract

This article traces the historical development of aesthetic practices of colour in the generic and industrial context of Nikkatsu Action Cinema of postwar Japan, and how they influenced the idiosyncratic style of Suzuki Seijun. Nikkatsu Action's needs as a genre devoted to a youthful and energetic subject matter shaped its colour design, and its filmmakers developed a bright, vibrant colour aesthetic by drawing on neon lighting and coloured light filters. It was within this context that Suzuki's colour style took shape. His earliest experiments take the Nikkatsu colour idiom and bend its diegetic pretexts to motivate sudden colour transformations. In his later Nikkatsu films, Suzuki elaborates on these experiments by transforming them into a critical component of his formal strategies. In *Gate of Flesh* (*Nikutai no mon*, 1964), he gives each of the four main female characters a colour-coded costume, and in each woman's internal monologue her dress colour becomes the colour of the entire background, suffusing the image with her subjectivity. Suzuki uses sudden colour transformations to punctuate violent action in his later action films, which this article considers in a reading of *Tattooed Life* (*Irezumi ichidai*, 1965)'s climax. Suzuki's experimentation gradually refines his colour design to an abstraction that belies its origins in popular genre cinema.

Suzuki Seijun's colour design appears briefly in many historical and theoretical accounts of colour in cinema, such as Richard Misek's[1] and Edward Branigan's;[2] there is a vague sense that his colour design is unique and worthy of study that has not been adequately developed. David Desser considers Suzuki's late Nikkatsu films, particularly *Gate of Flesh* (*Nikutai no mon*, 1964), in the broad context of colour filmmaking in Japan in the 1950s and 1960s. While Desser's work contains useful information about the introduction of colour technology

[1] Richard Misek, *Chromatic Cinema: A History of Screen Color* (Malden, MA: Wiley-Blackwell, 2010), pp. 50, 100.
[2] Edward Branigan, *Tracking Color in Cinema and Art: Philosophy and Aesthetics* (New York: Routledge, 2017), p. 21.

into Japan around this time, his reference points speak to the limited number of films available when he wrote the essay in 1994: namely, the early colour films of Ozu and Kurosawa, and a handful of watershed films like *Carmen Comes Home* (*Karumen kokyō ni kaeru*, Kinoshita Keisuke, 1951) and *Gate of Hell* (*Jigokumon*, Kinugasa Teinosuke, 1953). Suzuki's immediate context of Nikkatsu's popular youth and action films of the 1950s and 1960s, which bears a more immediate relationship to his colour design, is not discussed.[3]

In an interlude on neon lighting in urban-set East Asian cinema, James Tweedie considers their role in Suzuki's colour:

> In films like *Tokyo Drifter* [*Tōkyō nagaremono*, 1966], the neon sign, cosmopolitan, uprooted, and floating above the banalities of the street, presents a vision of the city to come, a spectacular space where light is dedicated to the cause of commerce… Suzuki embraces this future and develops an aesthetic of ubiquitous and often uniform color, with images that look as though they were lit entirely by these same neon signs.[4]

Tweedie identifies several crucial elements of Suzuki's colour design at Nikkatsu: the prominence of neon lighting, their modern urban location, the tendency toward uniform colour compositions, and the connection between the three. Interestingly, however, several of these techniques are not particularly unique to Suzuki and were common in Nikkatsu's popular action films in colour at the time. In particular, the neon lighting montage sequence that Tweedie describes had been nearly ubiquitous in these films since Inoue Umetsugu's *The Winner* (*Shōri-sha*, 1957) and *The Stormy Man* (*Arashi o yobu otoko*, 1957), and remained so through the period of Suzuki's celebrated late Nikkatsu films.

Because Suzuki was famously fired in 1968 after multiple conflicts with the studio's management, he is frequently cast in a familiar role as an iconoclastic artist. However, when we look at the colour design of Suzuki's films in relation to those of broader Nikkatsu popular cinema from the same period, we can see Suzuki experimenting with a colour idiom that was common among Nikkatsu's popular action films. This is not to say that Suzuki's colour style is merely a product of the industrial context that he worked in; rather, he gradually refines an inherited colour idiom into *abstraction*, isolating colour from diegetic objects that possess it.

Suzuki's colour design was also frequently discussed by the critics who first championed him in Japan in the immediate wake of his firing. In 1969, Yamane Sadao wrote on the motif of red camellia flowers in *Youth of the Beast* (*Yajū no seishun*, 1963). The flowers function as a clue, identifying Detective Takeshita's

[3] David Desser, 'Gate of Flesh(-tones): Color in the Japanese Cinema', in *Cinematic Landscapes: Observations on the Visual Arts and Cinema of China and Japan*, ed. by Linda C. Erlich and Desser (Austin: University of Texas Press, 1994), pp. 299–317.

[4] James Tweedie, 'Interlude 3: Neon', in *Cinema at the City's Edge: Film and Urban Networks in East Asia*, ed. by Yomi Braester and Tweedie (Hong Kong: Hong Kong University Press, 2010), pp. 89–92 (p. 89).

widow as the mastermind behind her husband's murder by their presence at the crime scene and on a tree in her backyard. Suzuki singles them out in their first appearance: in the film's prologue, the crime scene of Detective Takeshita's murder, they are the only part of the image to possess colour. There is a narrative motivation behind this decision: singling out the flower makes it easier to track where these red flowers reappear across the film, but the effect of singling out red in a field of black and white is excessive in a way that cannot entirely be explained by its narrative function. Yamane takes this a step further in his analysis: he points out that in the film's title card, a single character (the 'no,' or 'of') at the center of the screen is in red while the rest of the title card is in black and white. He argues that collectively, the title and opening sequence single out not just *red flowers* but *redness* as a quality of its own, distinct from the object that possesses it.[5]

Yamane's observation can be seen as part of a broader meta-cinematic celebration of Suzuki's films by a burgeoning generation of cinephiles, particularly at the newly formed film journal *Shinema 69*. In the same journal issue, Hasumi Shigehiko celebrated the visual tension between apparent visual depth and flatness in Suzuki's work; Hasumi argued that this articulated the inherent tension in cinema between the inherent flatness of the projected image and the appearance of depth that it produced, a tendency that can be seen in the abstract fields of solid colour that appear at once flat and infinitely deep in films such as *Kanto Wanderer* (*Kantō mushuku*, 1963), *Gate of Flesh*, and *Tokyo Drifter*.[6] Years later, Hasumi would argue that Suzuki's use of seasonal imagery, commonly used by other Japanese filmmakers as a naturally motivated stylistic flourish, isolates the imagery as a stylistic flourish devoid of representation of what could realistically be called seasons.[7] What these accounts identify in Suzuki's style is a move toward abstraction: identifying stylistic flourishes, gradually removing their diegetic pretexts, and distilling them into discrete stylistic elements. These moments appear fleetingly within individual Suzuki films, but looking at his Nikkatsu filmography as a whole, a sustained pattern of distilling and interrogating individual stylistic elements emerges. Suzuki stands at the crossroads between what David Bordwell has called the 'cinema of flourishes' and 'parametric narration'.[8]

[5] Yamane Sadao, 'Shudatsu-sha-Suzuki Seijun: Tsubaki no hana wa naze akai no ka?', *Shinema 69*, 2 (1969), 64–73 (p. 69).
[6] Hasumi Shigehiko, 'Suzuki Seijun to sono chinmoku no naritachi', *Shinema 69*, 2 (1969), 49–57 (pp. 50–53).
[7] Hasumi, 'Suzuki Seijun, mata wa kisetsu no fuzai', *Yurīka*, 4 (1991), 38–57. Hasumi points to *Kanto Wanderer*'s finale, in which Suzuki uses seasonal imagery for winter, summer, and fall in different scenes over the course of a single evening.
[8] Bordwell defines a 'flourish' as a momentary stylistic device that stands out partly because of its uniqueness, whereas 'parametric narration' involves stylistic patterns across an entire film that function self-reflexively. Though there are clear stylistic patterns like this in Suzuki's work, they tend to function across films rather than within a single film. See: David Bordwell, 'A Cinema of

I argue that Suzuki's colour aesthetic has its roots in the colour idiom of Nikkatsu Action Cinema, but becomes distinct by a move toward *abstracting* colour. I do not use 'abstract' to mean necessarily non-narrative or anti-narrative; Suzuki's Nikkatsu Action films are all narrative films, and as with the flowers in *Youth of the Beast*, his colour design is frequently at least partly motivated by narrative concerns.[9] I use Paul Coates' definition of abstract: 'the complete separation of color and object'.[10] After experimenting with the possibilities offered by an inherited style in the early 1960s, Suzuki *abstracted* colour design from diegetic objects into a discrete element of film form.

The Nikkatsu Action Cinema Colour Idiom

Though there were practices of adding colour to black-and-white film in the post-production process in Japan in the silent era,[11] the Japanese film industry began its transition to colour in earnest in the 1950s. The colour processes used were largely determined by the studios: Shōchiku and Tōhō adopted Fujicolor, Tōei adopted Konishiroku's Sakuracolor process, while Daiei adopted Eastmancolor. There was widespread frustration in the industry with the colour palettes offered by Fujicolor and Sakuracolor: Fujicolor was inadequate for its reds, Sakuracolor for its yellows.[12] Eastmancolor offered a richer colour palette than either of these processes, and quickly became preferred; its one significant drawback was the tendency for colour values in prints to decay more rapidly,[13] but preservation was not a major concern for studios at the time. Nikkatsu released its first colour feature, *The Green Music Box* (*Midori haruka ni*, Inoue Umetsugu) in 1955, using Konicolor, a newer colour stock from Konishiroku.[14] Subsequently, Nikkatsu switched its colour process to Eastmancolor, and would take advantage of the latter's expanded colour palette for the films discussed here.[15]

Flourishes: Decorative Style in 1920s and 1930s Japanese Film', in *Reframing Japanese Cinema*, ed. by Desser and Arthur Noletti (Bloomington: Indiana University Press, 1992), pp. 327–45.

[9] Laura Lee has argued that Suzuki's use of still frames in *Satan's Town* (*Akuma no machi*, 1956) and *Carmen from Kawachi* (*Kawachi karumen*, 1966) originates in a desire to mediate a character's subjectivity through unconventional means, but that its resulting effect also interrogates the act of representation and cinema's boundaries with other art forms. Suzuki's use of the solid colour backgrounds arguably function in a similar way. See: Laura Lee, *Japanese Cinema Between Frames* (New York: Palgrave Macmillan, 2017), pp. 54–56, 70–72.

[10] Paul Coates, *Cinema and Colour: The Saturated Image* (London: BFI Palgrave, 2010), p. 30.

[11] See: Hiroshi Komatsu, 'From Natural Color to the Pure Motion Picture Drama', *Film History*, 7 (1995), 69–86.

[12] Okajima Hisashi, 'Color Film Restoration in Japan: Some Examples', trans. by Akiko Mizoguchi, *Journal of Film Preservation*, 66 (Oct. 2003), 32–36 (p. 33).

[13] For a technical and historical discussion of Eastmancolor, see: Heather Heckman, 'We've Got Bigger Problems: Preservation during Eastmancolor's Innovation and Early Diffusion', *The Moving Image*, 15.1 (Spring 2015), 44–61.

[14] Ivi, p. 35.

[15] Jasper Sharp, 'Japanese Widescreen Cinema: Commerce, Technology and Aesthetics'

What Watanabe Takenobu calls 'Nikkatsu Action Cinema' took shape in 1956, beginning with the films *Season of the Sun* (*Taiyō no kisetsu*, Furukawa Takumi) and *Crazed Fruit* (*Kurutta kajitsu*, Nakahira Kō), each starring Ishihara Yūjirō.[16] Ishihara's star, and that of Nikkatsu Action more generally, rose further the following year with the popularity of *I Am Waiting* (*Ore wa matteiru ze*, Kurahara Koreyoshi) and particularly *The Stormy Man*. Michael Raine has given a detailed account of how Nikkatsu promoted Ishihara's rise to stardom, emphasizing, among other things, the importance of the theme songs in Ishihara's films (particularly *The Stormy Man*), which were released by Ishihara as singles with a cross-promotion strategy.[17] This set underway a practice of multimedia stardom at Nikkatsu, and as a result of this practice, Nikkatsu Action films often feature musical performances in a nightclub stage space. The stage spaces of modern Ginza nightclubs would become foundational to other aspects of the genre's aesthetics, particularly as the studio adopted anamorphic framing (whose dimensions more closely mirrored stage spaces) and colour.[18]

In *The Winner* and *The Stormy Man*, Inoue took advantage of the films' exterior nighttime scenes in Tokyo's Ginza district and interior stage spaces in nightclubs as a pretext for intense colour design. Though the association between musical performance and colour would appear to replicate the prominence of colour design in Hollywood musicals, an important difference quickly emerges. Richard Misek makes a useful distinction between *surface color* (the colour of objects as they appear in white light) and *optical color* (colour created by lighting).[19] He argues that even within musicals, Hollywood films tended to use white light and to create their more elaborate colour schemes with *surface color*: the props, set designs, and costumes, as spelled out in the guidelines of Hollywood's Society of Motion Picture and Television Engineers (SMPTE).[20] At Nikkatsu, however, Inoue and other filmmakers quickly began using coloured light filters in stage spaces, street scenes in the Ginza district (motivated by off-screen neon lights), and even in interior spaces in the Ginza district (motivated by off-screen neon

(unpublished doctoral thesis, University of Sheffield, Department of English Literature, Language and Linguistics, 2013), pp. 213–18.

[16] Watanabe Takenobu, *Nikkatsu Akushon no karei na sekai* (Tokyo: Mirai-sha, 2004), p. 24. Mark Schilling has condensed much of the information contained in Watanabe's book in English, alongside new interviews and Schilling's own critical evaluations. See: Mark Schilling, *No Borders, No Limits: Nikkatsu Action Cinema* (Godalming: FAB Press, 2007).

[17] Michael Raine, 'Ishihara Yūjirō: Youth, Celebrity, and the Male Body in Late-1950s Japan', in *Word and Image in Japanese Cinema*, ed. by Dennis Washburn and Carole Cavanaugh (Cambridge: Cambridge University Press, 2010), pp. 202–25 (p. 214).

[18] Nikkatsu began incorporating colour and anamorphic lenses in the mid-1950s, and transitioned completely to anamorphic in June 1958. The colour transition was more irregular: after 1959, shooting in colour became more common but was not universal (Watanabe, *Nikkatsu Akushon*, pp. 24–25).

[19] Misek, p. 6.

[20] Ivi, p. 128.

lights coming in through windows).[21] Within a few years, Nikkatsu would begin increasingly shooting action films on location outside of Tokyo. In cases where the films were shot in other modern cities, filmmakers would simply use these cities' nightlife districts in a similar way to the Ginza in Tokyo-set films. Rural settings, like those used in Suzuki's *Blood-Red Water in the Channel* (*Kaikyō, chi ni somete*, 1961) and *The Man With a Shotgun* (*Shottogan no otoko*, 1961), offered filmmakers fewer pretexts for optical colour, and their colour design featured less formal play as a result.

The emphasis on optical colour had important implications for the colour design of Nikkatsu Action films. It gave sequences in nightlife districts a vibrant colour scheme, but one unlike those found in Hollywood musicals. Since colour-filtered light would function as the key light for an entire frame, the entire image would appear in subtle variations in hues of that colour. As a result, the colourful individual frames in Nikkatsu Action films tend to be either uniform in colour design, or to divide sections of the image into different colours using multiple coloured light sources (what Misek refers to as 'chromatic zoning').[22] It also allowed for more rapid transformations of the colour scheme of an individual shot without editing. In *The Stormy Man*, for example, Inoue uses multiple coloured light filters cycling over Ishihara during his performance so that he and his surroundings quickly change colours. Filmmakers also frequently use these rapid colour transformations to introduce kinetic energy, enhanced by the vibrancy of the colours, into scenes like Ishihara's drum solo. Many scenes incorporated coloured lights coming in through windows and alternating or cycling through different colours. A particularly baroque example can be found in *The Volcano's Wind* (*Umi o wataru hatoba no kaze*, Yamazaki Tokujirō, 1960), where Shishido Jō attempts to break into a safe in a nightclub at night, pink and green lights alternate shine into the room as the scene's key light, so that the sequence's light scheme in its entirety constantly shifts between pink, black, and green.

In the mid-to-late 1960s, there was a broad decline in theatrical attendance across Japan and new competition from Tōei Studio's *ninkyō* ('chivalry') films, both of which hurt Nikkatsu's box office receipts.[23] That, along with Suzuki's declining stock at the studio, meant that the number of colour films declined toward the end of his tenure at Nikkatsu: between *Fighting Delinquents* (*Kutabare gurentai*, 1960) and *Our Blood Will Not Forgive* (*Oretachi no chi ga yurusanai*, 1964), fourteen of Suzuki's fifteen films were in colour; between *Story of a Prostitute* (*Shunpuden*, 1965) and *Branded to Kill* (*Koroshi no rakuin*, 1967), only two of his seven films were in colour. Suzuki had little control over whether

[21] Daisuke Miyao has discussed the practice of using isolated spots of light against mostly dark, shadowy compositions in what he calls 'street films' (urban films set mostly at night of the 1920s and 1930s); Nikkatsu Action films arguably update the aesthetic for colour by adding colour filters to the light sources. See: Daisuke Miyao, *The Aesthetics of Shadow: Lighting and Japanese Cinema* (Durham: Duke University Press, 2013), pp. 235–336.
[22] Ivi, p. 143.
[23] Watanabe, *Nikkatsu Akushon*, pp. 24–25.

his films would be in colour, and the studio's decision-making process regarding colour could be nebulous and change very suddenly. His assistant director Sone Chūsei writes that Suzuki had believed, along with most of the film's cast and crew, that *Carmen from Kawachi* would be filmed in colour, only to learn that the film would be in black and white when the studio issued black-and-white film stock;[24] Suzuki recounts a similar occurrence with *Fighting Elegy* (*Kenka ereji*, 1966).[25]

Suzuki's Earliest Colour Experiments, 1960–1962

When Suzuki directed *Fighting Delinquents* in colour at the end of 1960, the Nikkatsu Action colour idiom had been firmly established. Suzuki's earliest colour films adopt aspects of this colour idiom: performance spaces as a pretext for coloured light filters, exterior scenes in nightlife districts with neon lights and key lights from coloured light filters implied to be from neon light sources, and the use of coloured light filters to facilitate rapid and shocking shifts in an overall colour scheme. However, even in *Fighting Delinquents*, Suzuki begins to experiment with this idiom in unconventional ways, and to push the ostensible diegetic pretexts of his coloured light cues well past plausibility. Suzuki films a conversation scene in a nightclub during a performance, and directly shows the coloured light filters it uses. After showing the transition between red and blue light filters, Suzuki cuts to a two-shot of a man and woman bathed in a blue light. The colour is uniform across the frame, but it shifts multiple times over the course of the scene: from blue to green, from green to yellow, from yellow to white light, and, finally, to a garish red (fig. 1). Though Suzuki takes the trouble to show the cycling light filter before the conversation, the uniform lighting across the frame, particularly as part of the nightclub that is not close to the stage, seems implausible. Even though the colour shifts are motivated by the cycling of a light filter, they are timed to turning points in the conversation: the blue-to-green shift takes place at the moment when the man tells the woman that her long-ago-abandoned son has reappeared, and the colour shift underscores the change in her facial reaction when she hears the news. Though the technique has both a diegetic pretext and a dramatic function in the scene, it is so overtly manipulative and unrealistic that it turns into a self-reflexive joke about the use of colour and light shifts within Nikkatsu Action Cinema.

Suzuki would continue to use similar lighting cycles to create major compositional colour shifts over his next several films: in *Tokyo Knights* (*Tōkyō naito*, 1961), in a car scene with a rear-projected background of a Ginza street, using the familiar process of passing lights across the car windows in combination

[24] Sone Chūsei, *Sone Chūsei jiden: Hito wa nanomi no tsumi no fukasa yo* (Tokyo: Bunya-sha, 2014), p. 105.
[25] Interview with Suzuki Seijun, *Tokyo Drifter* DVD (New York: Criterion Collection, 2011).

Fig. 1: *Fighting Delinquents* (*Kutabare gurentai*, Suzuki Seijun, 1960)

with rear projection to suggest movement, he cycles through a series of colour filters so that the villain is bathed sequentially in orange, green, yellow, pink, and blue light. In a performance sequence in *Reckless Boss* (*Muteppō daisho*, 1961), Suzuki uses spatially discontinuous editing to show three performers suddenly shift to different parts of a nightclub so that they appear suddenly under purple, red, and yellow lights. In *The Wind-of-Youth Group Crosses the Mountain Pass* (*Tōge o wataru wakai kaze*, 1961), Wada Kōji fights with another man at a festival, and the other man throws three different coloured juices at him in succession. As each juice splashes across Wada's face, the lighting shifts: red light for the red juice, yellow light for the yellow juice, and green light for the green juice. Though Suzuki maintains a diegetic pretext within each of these sequences, the pretexts seem to become flimsier with each successive film.

These colour cycles in Suzuki's earliest colour films contain the seeds of what will become Suzuki's personalized colour style in his later films at Nikkatsu. First, the uniformity imposed by the coloured light filters would persist even as Suzuki incorporated surface colour in his colour design: rather than intricate colour patterns, Suzuki's colour design at Nikkatsu favored vibrant solid colours in lighting, costume design, and set design. Second, the sudden colour shifts would become important for his later action films, in which he often punctuates violent action either by similar sudden shifts in colour through lighting, or blocking and staging. Third, Suzuki is typically less interested in an individual colour *per se* than he is with colour vibrancy and with the visceral shock created by sudden colour shifts. In his later Nikkatsu films, the significance of colours will likewise not be found in the 'meanings' of individual colours, but rather in the ways that they repeat across a film as a motif, or shift suddenly in a scene.

Forging a Style, 1963–1966

Perhaps Suzuki's most famous use of colour is in *Gate of Flesh*. In a technique that grows directly out of Suzuki's colour cycles in his earliest colour films, Suzuki deploys a schematic colour design of solid colours, assigning one to each of the

Fig. 2: *Gate of Flesh* (*Nikutai no mon*, Suzuki Seijun, 1964)

four central women in the film who work at a cooperative brothel. The bright, solid colours of the women's outfits stand out against their drab surroundings in the bombed-out slums of Tokyo in the immediate postwar, and they also distinguish the four central women from the other sex workers in the film, who wear dresses in a neutral main colour with patterns or prints on them. By using a consistent colour for each of the individual women throughout the film, Suzuki creates a colour association with individual characters that he can draw on to provide subjective access to the characters at specific moments.[26] As each of the four women delivers an internal monologue in succession, the colour of her dress extends to the background set colouration (fig. 2). Though Suzuki develops this technique with surface colour in addition to optical colour, the emphasis on colour uniformity in the costume designs, and particularly in the frames overwhelmed by a uniform solid colour, derives from the effect of the coloured light filters seen in his earlier films. Using surface colour and post-production colour additions, Suzuki modulates the amount of colour at different moments in the film. The series of internal monologues is the most extreme example, but at other moments, such as when the three other women are torturing Maya, a gauzy green haze infuses the screen and surrounds her.

The internal monologues in *Gate of Flesh* point to another tendency in Suzuki's late Nikkatsu films, beginning with *Kanto Wanderer*: his tendency to use negative

[26] Desser reads the colours symbolically based on a misunderstanding of an interview in which Suzuki reads several symbolic interpretations of the film's colours by critics, though Suzuki has subsequently said that he only supplied these readings to mock them, and that his only intention was to pick colours that stood out from the background and were consistent across the film. Desser acknowledges that Suzuki's supplied readings do not map meaningfully onto the characters, but he supplies alternative symbolic readings ('red = leadership') that seem arbitrary at best. See: Desser, p. 315; 'Interview with Suzuki Seijun', *Eiga Hyōron*, January 1960, p. 20; 'From the Ruins: Making *Gate of Flesh*', *Gate of Flesh* DVD (New York: Criterion Collection, 2005).

space backgrounds with abstract colour design. In the climax, the protagonist Katsuta slices a man, sending him through a *fusuma* in the background. The set collapses around the man, revealing a solid red colour. Shot perspectivally, the red in the background appears to have no beginning or end, and becomes simply an abstract field of colour. In subsequent films, Suzuki would continue to use these abstract colour backgrounds, particularly in action sequences. In some cases, the colour of the background shifts to punctuate action, as in a scene in *Tokyo Drifter* where the background shifts from red to white as Tetsu shoots a gun out of an enemy's hand.

These abstract colour fields are a perfect example of the phenomenon that Hasumi had described when he discussed the play between flatness and depth in Suzuki's films. The perspectival framing gives the impression that the red wall is not a wall but a vacant mass of red that expands outward indefinitely: it relies on perspectival framing and sets that are built, lit, and filmed to prevent a clear distinction between ground, wall, and ceiling. These bear a relationship to a common production technique in cinema to leave large empty spaces, usually to be filled in during post-production. These date back to the tendency in early cinema to leave a large, black field of empty space to be filled in by another superimposed shot later, and have a legacy through the use of chroma key effects.[27] However, Suzuki frequently leaves these spaces empty in post-production, filled only by bright colours that occasionally transform in response to actions that take place in front of them. In subsequent films, Suzuki continues to use these primary-coloured negative spaces in a variety of ways: marking out subjective spaces for characters to deliver internal monologues (*Gate of Flesh*), as backgrounds that shift colour, seemingly responding to the diegesis rather than being part of it (*Tokyo Drifter* and other action films), or exploiting the negative space for its ambiguity (*The Fang in the Hole*, *Ana no kiba*, 1979).

These fields in a solid colour derive in part from the way that the emphasis on optical colour within Nikkatsu Action Cinema produces uniform colouration over an image. There is, however, another influence that becomes significant for Suzuki in this period that we should consider in looking at this new colouration scheme. *Kanto Wanderer* and *Tattooed Life* (*Irezumi ichidai*, 1965) are both examples of Nikkatsu's attempts to compete with Tōei's *ninkyō* films.[28] *Ninkyō* films foregrounded both the conflict between *giri* ('loyalty' to the clan) and *ninjō* ('human sympathy'), as well as the conflicts between these values and the social transformations in the early modern era.[29] Instead of the modern urban

[27] Trond Lundemo, 'The Colors of Haptic Space: Black, Blue, and White in Moving Images', in *Color: The Film Reader*, ed. by Angela Dalle Vacche and Brian Price (New York: Routledge, 2006), pp. 88–101.

[28] Suzuki's *The Flowers and the Angry Waves* (*Hana to dōto*, 1964) is also a *ninkyō* film. Some Nikkatsu films also adapted *ninkyō* themes to the modern, urban settings of other Nikkatsu Action films, including *Our Blood Will Not Forgive* and *Tokyo Drifter*.

[29] Watanabe Takenobu, 'Ninkyō eiga sōmokuroku: 1961–1969', in *Ninkyō eiga no sekai*, ed. by Kusumoto Kenkichi (Tokyo: Arechi, 1969), pp. 212–35.

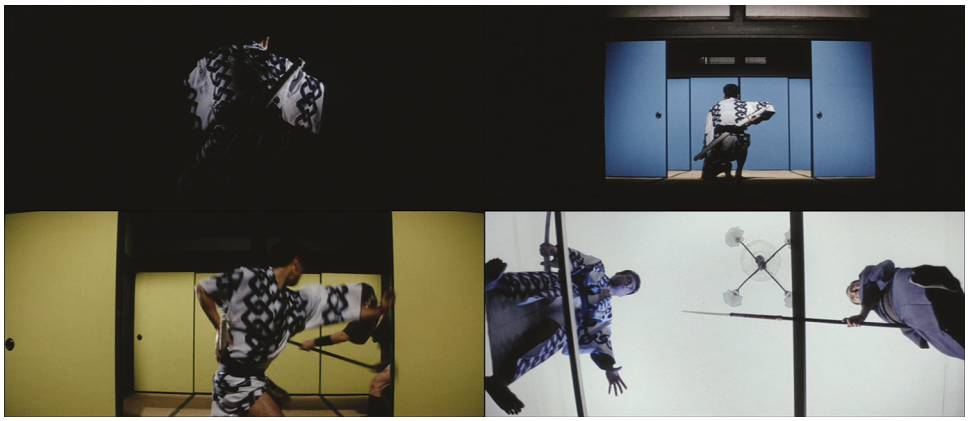

Fig. 3: *Tattooed Life* (*Irezumi ichidai*, Suzuki Seijun, 1965)

nightclubs that characterized Nikkatsu Action films, a more prominent setting for *ninkyō* films was the upstairs *bakuchiyado* (a secret gambling den). These incorporated Japanese architecture into their staging: *shōji* and *fusuma*[30] could be broken down in combat, or simply opened, to create a sudden, dramatic change in the composition.[31]

Suzuki adopts this strategy in later action films, but he incorporates colour transformations into these spatial transformations. In the climax of *Tattooed Life*, the protagonist Tetsutarō moves laterally across a thinly lit trajectory in the foreground towards his enemy's house, and his movement is followed by tracking shots until he reaches the entrance. Tetsutarō then moves from a flat, virtually monochromatic image into depth and into colour. This incorporates the colour shifts into the action: aggressive movements forward into depth reveal new colours as he opens doors and reveals new coloured doors behind him, and aggressive movements outward towards Tetsutarō reveal new colours as they break down doors. Since *fusuma* are traditionally the colour of the paper from which they are made,[32] the blue and yellow colors are abstracted from the surfaces that they appear on; rather than blue and yellow *fusuma*, they are blue and yellow *on fusuma*. It culminates in a showdown with his opponent against a white ceiling (fig. 3). The sequence begins in a flat, nearly monochrome image of Tetsutarō and his black-and-white *kimono* against an all-black background.

[30] *Shōji* and *fusuma* are both rectangular screens and function as both doors and walls; however, *shōji* are translucent while *fusuma* are opaque.
[31] As Noël Burch observes, this use of Japanese architecture in fight choreography has been common since at least the *chanbara* ('swordfighting') films of the 1920s set in the premodern era; *ninkyō* films simply draw on this practice in their early modern setting. See: Noël Burch, *To the Distant Observer* (Berkeley: University of California Press, 1979), p. 118.
[32] Some *fusuma* may be decorated by paintings, and there is also a tradition of *kinbusama* ('golden' *fusuma*), but the solid, bright colours seen here would be unusual even in these cases.

Opening the *fusuma* suddenly introduces both depth and colour into the image, and the colours shift as he progresses. After he and his assailants successfully break down all of the *fusuma* in combat, the sequence culminates in another nearly monochrome image of Tetsutarō facing off against his opponent, and the extreme low-angle through the apparent floor of the house throws the sense of perspectival space into confusion. There is a clear formal progression into and out of depth that Suzuki complements with sudden colour transformations as new spaces are revealed. To the sudden shifts in dominant colour that we saw in his earlier lighting cycles, or even the series of internal monologues in *Gate of Flesh*, Suzuki now adds not just a shift between colours, but a shift *into* and *out of* colour. In the more famous climactic shootout of *Tokyo Drifter*, Suzuki uses a similar progression of nearly monochrome to wild colour shifts to nearly monochrome again, though he uses lighting shifts rather than the play with blocking and depth that we see in the climax of *Tattooed Life*.

Conclusion

The personal colour aesthetic that Suzuki refined during his career at Nikkatsu grows out of a broader colour idiom that was commonly used by his contemporaries at the studio; it could even be seen as a distillation of these tendencies. The prominence of optical colour in the form of stage lights or neon light that were common across Nikkatsu Action films allowed Suzuki to isolate colour itself from the objects in front of the camera, and to shift the colour schemes of images very suddenly. Even as Suzuki makes films with settings far from the glamorous nightclubs of the Ginza district in Japan's high-growth period like the early modern era or the decimated slums of Tokyo in the immediate postwar, he builds on an approach to colour design that was shaped by these early experiments, and develops new ways to isolate solid colours in his compositions and to shift those colours unexpectedly. His approach abstracts colour in the sense that Coates uses the term, causing it to function as an autonomous stylistic flourish that could suffuse the screen with a character's subjectivity, underscore violent actions, or perform other functions while forgoing a diegetic pretext. In spite of these self-reflexive colour techniques, Suzuki's films are resolutely located in popular genre cinema. Through colour, he was able to prevail over the limitations of his industrial context and to abstract individual colours as elements of film form that could be isolated and transformed independently of any diegetic objects that might be said to possess them.

From the Margins to the Mainstream? The Eastmancolor Revolution and Challenging the Realist Canon in British Cinema

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Abstract

This article focuses on Eastmancolor's introduction in the British film industry from 1954 to the complete adoption of colour by the end of the 1960s. We discuss how aesthetic experiments with colour offer a compelling parallel history to debates concerning British film genres, films and filmmakers. This approach allows us to see British film history through a different lens, to move beyond the constraints of the monochromatic realist canon and explore familiar and unfamiliar films in the 'fresh light' of colour. We select key film genres including the adoption of colour within the social realist film, considering whether black-and-white conventions were disrupted by the addition of colour. The section on Hammer horror films demonstrates how colour popularised a largely dormant British genre, while our consideration of the popular *Carry On…* comedies looks at colour's centrality to a new narrative approach for that series. Finally, we consider the historical biopic, focusing on *Isadora* (Karel Reisz, 1969) in relation to how colour defined thematic and narrative concerns with psychology, temporality and symbolism. We conclude that these years of experimentation constitute an essential transition period in which filmmakers were engaged in a complex negotiation with intermedial chromatic trends.

Introduction

Our research project, 'The Eastmancolor Revolution and British Cinema, 1955–85', reveals how a colour-centric approach to British cinema challenges existing understandings of what constitutes the 'canon' of films that have received the greatest critical attention as markers of cultural value.[1] Discussions of international or American film canon formation highlight the critical selection of artistically or culturally renowned works which tends to be perpetuated by

[1] The project is funded by the Arts and Humanities Research Council (AHRC) grant no. AH/N009444/1.

academics, the film industry, and through popular discourse.[2] In relation to British cinema, critics have historically privileged black-and-white documentary social realism as a marker of quality and importance, often signalling such realist films as the 'correct path for British cinema'.[3] Focusing on the mid-century period from the initial adoption of Eastman Colour in 1954 until the full adoption of colour at the end of the 1960s, we discuss how aesthetic experiments with colour can offer a compelling parallel history to debates around British film genres, films and filmmakers. This approach allows us to see British film history through a different lens, to move beyond the constraints of the monochromatic realist canon and explore familiar and unfamiliar films in the 'fresh light' of colour.[4]

The academic study of colour film has increased in recent years, with the bulk of that work focusing on the pre-sound era or the Technicolor monopoly within the film industry.[5] That scholarship has its own canonical traits, with fantasy, musical, animation, and historical films dominant in the US Technicolor feature canon while British Technicolor films such as *A Matter of Life and Death* (Michael Powell and Emeric Pressburger, 1946) and *Jassy* (Bernard Knowles, 1947) offer a different approach based on techniques developed by the British school of Technicolor.[6] Our project moves beyond that time scale and focus, using the British experience of the 35mm Eastman Colour film stock as the key event to consider how colour reshaped this national industry.[7] British 'Eastman Colour' is clearly not a discrete element than can be easily lifted out for study, as it represents a national usage embedded within broader Eastmancolor adoption in the US and elsewhere. American colour films represent the bulk of films released at British cinemas in this period, and remained popular with audiences. Additionally, Eastman Colour was regularly paired with widescreen processes such as CinemaScope, VistaVision, and Panavision, or other processes such as

[2] Janet Staiger, 'The Politics of Film Canons', *Cinema Journal*, 24.3 (1985), 4–23 (p. 8); Jonathan Rosenbaum, *Essential Cinema: On the Necessity of Film Canons* (Baltimore and London: The John Hopkins University Press, 2004); Christopher Long, 'Revising the Film Canon', *New Review of Film and Television Studies*, 4.1 (2006), 17–35.

[3] Charles Barr, 'Introduction: Amnesia and Schizophrenia', in *All Our Yesterdays: 90 Years of British Cinema*, ed. by Barr (London: BFI, 1986), pp. 1–29 (pp. 13–14). For more on the documentary realist tradition, see: John Ellis, 'Art Culture and Quality — Terms for a Cinema in the Forties and the Seventies', *Screen*, 19.3 (1978), 9–50; Andrew Higson, '"Britain's Outstanding Contribution to the Film": The Documentary-Realist Tradition', in *All Our Yesterdays*, pp. 72–97; Julian Petley, 'The Lost Continent', in *All Our Yesterdays*, pp. 98–119.

[4] Barr, p. 14.

[5] James Layton and David Pierce, *The Dawn of Technicolor, 1915–1935* (Rochester, NY: George Eastman House, 2015); Joshua Yumibe, *Moving Color: Early Film, Mass Culture, Modernism* (New Brunswick, NJ: Rutgers University Press, 2012).

[6] Sarah Street, *Colour Films in Britain: The Negotiation of Innovation, 1900–55* (Hampshire: Palgrave Macmillan, 2012).

[7] The spelling 'Eastman Colour' is used throughout this article since it was the most common usage in British industry publications and documents. For more on Eastmancolor's introduction see Heather Heckman, 'We've Got Bigger Problems: Preservation during Eastmancolor's Innovation and Early Diffusion', *The Moving Image*, 15.1 (2015), 44–61.

stereoscopic 3-D or Dynamation. For this article, we necessarily bracket the British use of Eastman Colour in order to consider its specific impact on the realist canon within Britain. In the broader project, the complex interaction of Eastman Colour with other colour processes, technologies, and the influences of Hollywood and other national cinemas, is given due prominence.

What we offer here are four case studies that foreground the use of colour within British film genres, each of which reveals a different perspective on how colour was deployed within the British film industry. Given its primacy within critical debates, the article first considers the adoption of colour within the social realist film, and whether the genre was disrupted by the addition of colour to its prevalent black-and-white aesthetic. The section on Hammer horror films reveals how colour was used to popularise a largely dormant British genre, while our consideration of the perennially popular *Carry On…* comedy series looks at how colour was central to the development of a new narrative approach for that series. Building on those sections, we look to the historical biopic, where a key film and director from the late 1960s allows us to consider how colour was being used to define thematic and narrative concerns with psychology, temporality and symbolism.

Colour in Social Realism

As already discussed, the strong association of social realism with black-and-white cinematography is well-established, almost clichéd, particularly in the established canon of 'New Wave' British films.[8] Geoff Brown notes black and white as 'the perfect colour scheme for gloomy skies, smokestacks and poetic melancholy'.[9] This viewpoint made filmmakers cautious when attempting to depict 'the real' in Eastman Colour. Art director Carmen Dillon and cinematographer Chris Challis, for example, created a muted palette for the sets of *Miracle in Soho* (Julian Amyes, 1957) in spite of the film's vibrant, cosmopolitan locale.

Yet colour presented opportunities for innovation within realism, and our project has brought to light films that contributed towards the mainstream shift to colour. Social trends influenced this development with colour increasingly vibrant in advertising, fashion and interior décor. British marketing specialist Eric P. Danger emphasized connections between colour and affluence, youth and modernity.[10] While the classic 'New Wave' films featured these themes the persistence of a black-and-white realist aesthetic meant that the cycle was unable

[8] The cycle from *Look Back in Anger* (Tony Richardson, 1958) to *Billy Liar* (John Schlesinger, 1963).
[9] Geoff Brown, 'Paradise Found and Lost: The Course of British Realism', in *The British Cinema Book*, ed. by Robert Murphy (London: BFI, 3rd edition, 2009), pp. 28–38 (p. 29).
[10] Eric P. Danger, *Using Colour to Sell* (London: Gower Press, 1968).

to fully exploit this key observation. Filmmakers who did use colour to both reflect and critique the times produced work that pushed aesthetic and generic boundaries. One such director was Clive Donner who worked for the J. Walter Thompson advertising agency and made commercials for television. *Some People* (1962), his first feature film, was noted for its vitality and fresh approach to realism by critic V. F. Perkins. Donner turned to Eastman Colour 'for the entertainment value, but also because to me the convention that reality is better in black and white is just a convention, and there's no reason why we shouldn't adopt another one'.[11] *Some People* was filmed in Bristol, a city that was not an industrial heartland, and focused on youth problems in housing estates. Donner used colour as a means of connecting characters to their local environment, their clothes and identities, with a satirical opening montage showing a neon sign flashing 'Bristol' followed by bright hoardings advertising food, jewels, motorbikes, hire purchase schemes and consumer products. This visual assault is full of colour interest, announcing the film's general tone of openness to stylistic experimentation, wit and energy. The world of advertising and hire purchase is very much part of the characters' lives in a city experiencing economic transition. In this way, *Some People* is alive to colour's potential for contemporary realist drama. Although *Some People* was well-reviewed and did well at the box-office, it eluded the critical radar, largely because it differed from the classic 'New Wave' cycle. Yet in retrospect it began an important trend in experimenting with colour for social observation.

Clive Donner went on to make other distinctive colour films, most notably *Nothing but the Best* (1963). This is a biting satire on social class, featuring Jimmy (Alan Bates), an opportunist who uses charm, guile and violence to repress his working-class background and rise to the top. Donner used colour to chart Jimmy's social climb and to demark the film's three segments, beginning with brash, primary colours and progressing to 'a sort of muddy, porridgy middle period, and coming out into rather muted elegant neo-regency tones'.[12] He and cinematographer Nicolas Roeg also incorporated experimental techniques such as changing colour negative into positive in the opening titles 'to show the whole hypocritical nature of society in which we live today: don't take anything at face value, have a look behind it, see what it is'.[13]

Colour provided opportunities for expressivity in other lesser-known realist films. It added dramatic value to *Sapphire* (Basil Dearden, 1959) and *Flame in the Streets* (Roy Ward Baker, 1961), films that focused on racial issues. In their linkage of vivid colours with sexuality and racial identity, these films exposed the ideological assumptions upon which such judgements are made. They also reveal a complex relationship with colour during a period in which it stood for experimentation, novelty and exoticism while at the same time artificiality, danger

[11] V. F. Perkins, 'Clive Donner and *Some People*', *Movie 3* (October 1962), 22–25 (p. 23).
[12] 'Interview with Clive Donner', *ISIS*, 5 September 1964, pp. 15–16.
[13] Ibid.

and otherness. *The Family Way* (John and Roy Boulting, 1966) shows a young couple's aspirations for a 'Moonlight Special' honeymoon abroad, as advertised by vivid drawings of blue seas and skies, golden beaches and palm trees. But this turns out to be a swindle when the travel agent makes off with everyone's money; what at first looks exciting is the opposite. But the same film also uses colour evocatively to convey the past in a non-realist mode. A character recalls a romantic memory, but this is not seen through a flashback. Instead, as she speaks the background becomes infused with a blue/violet chromatic effect. In this way colour opened-up realist conventions to impressionistic effects and a greater variety of visual tropes to provoke audiences into re-evaluating information and cultural values.

Directors such as Ken Loach who were at first reluctant to use colour subsequently exploited its multivalent properties. The chromatic sensibility of *Poor Cow* (1967) contributed greatly to its verisimilitude, communicating a sensuous experience of the look and feel of the mid-1960s. The shock of seeing vivid colour in a realist drama is announced in the first scene of a woman giving birth. Colour then documents domestic interiors, urban development and also satirizes the advertising world. In this way, although the association between realism and black and white has persisted, films that were the exception to this rule in the mid-century period played a key role in challenging canonical histories of British cinema.[14]

Hammer and Beyond

Hammer Film Productions dominate discussions of post-war British horror cinema, starting with the first British horror film shot in colour, *The Curse of Frankenstein* (Terence Fisher, 1957). Hammer's status in the early 1960s was principally due to the lavish chromatic spectacle of period fantasy found in its films, something that set the company apart from other British horror productions of the period, which were largely associated with contemporary settings and a black-and-white aesthetic. The commercial failure of Hammer's own black-and-white contemporary horrors was linked by one critic to the studio's colour period fantasies since they were 'unencumbered… [by] suggestions of realism carried by modern locations'.[15] Yet the success of the period horror films was challenged by a social and industrial shift towards a more 'realistic' use of colour within film as a result of a wider 'technological and aesthetic shift within cinema'.[16]

By the mid-1960s, the association between fantasy, horror and colour was

[14] Street, 'The Colour of Social Realism', *Journal of British Cinema and Television*, 15.4 (2018), 469–90.
[15] David Robinson, quoted in Peter Hutchings, *Hammer and Beyond: The British Horror Film* (Manchester: Manchester University Press, 1996), p. 65.
[16] Hutchings, p. 132.

beginning to unravel, with the notion of colour adding realism having 'important implications for the horror genre'.[17] The success of the Amicus film *Dr Terror's House of Horrors* (Freddie Francis, 1965) led to 'a cluster of films which seek, presumably in the commercial interests of product differentiation, to relocate horror in a recognisable present-day world while at the same time appealing to the already established market for that period horror'.[18] Other contemporary-set colour films attempted to blur the lines of demarcation by introducing elements of period fantasy into modern settings. This approach made the transition less conspicuous and played a key role in shaping the look of British horror in the following decade. Such films as *It!* (Herbert J. Leder, 1967), for example, combined the storyline of a supernatural Golem brought back to life by Arthur Pimm (Roddy McDowall) with psychological themes in the form of Pimm's relationship with his deceased mother, an echo of *Psycho* (Alfred Hitchcock, 1960).

These transitional films also echo Hammer's earlier colour films in their approach to chromatic design. In the early stages of Eastman Colour's adoption, the Society of Motion Picture Television Engineers (SMPTE) recommended Technicolor's approach to film colour.[19] Possibly as a result of that advice, the horror colour aesthetic developed at Hammer by director Terence Fisher, cinematographer Jack Asher, art designers Edward Marshall and Bernard Robinson, and costume designers Molly Arbuthnot and Rosemary Burrows for *Curse of Frankenstein* and *Dracula* (Fisher, 1958), has strong parallels with Technicolor's methods, notably the use of colour to underscore narrative events.[20] Beyond Hammer, that chromatic legacy is felt in a number of late-1960s horror films, including *The Deadly Bees* (Francis, 1966), *The Psychopath* (Francis, 1966), *Twisted Nerve* (Roy Boulting, 1968), *Curse of the Crimson Altar* (Vernon Sewell, 1968) and *Corruption* (Robert Hartford-Davis, 1968), in which the use of colour combines those earlier associations with fantasy and the verisimilitude of contemporary settings and themes. The ethereal green lighting that dominates scenes of ritual sacrifice in *Curse of the Crimson Altar*, for example, resembles Hammer's deployment of colour to designate the supernatural or otherworldly through the appearance of the eponymous antagonist in *The Mummy* (Fisher, 1959) and during sequences featuring the life-elixir in *The Man Who Could Cheat Death* (Fisher, 1959). The blood-red interiors of the homes of Mrs Von Sturm (Margaret Johnston) in *The Psychopath* and Mr Manfred (Frank Finlay) in *The Deadly Bees* infer the ever-present threat of bloody violence found in *Dracula* and *Dracula: Prince of Darkness* (Fisher, 1966). Equally, the association of yellow

[17] Ibid.
[18] Ivi, p. 130.
[19] Scott Higgins, *Harnessing the Technicolor Rainbow: Color Design in the 1930s* (Austin: University of Texas Press, 2007), p. 47.
[20] Natalie Kalmus, 'Color Consciousness', *Journal of the Society of Motion Picture Engineers*, 25.1 (August 1935), 139–147 (p. 140). Technicolor's Natalie Kalmus ascribed a role to colour similar to the musical score, editing and set design for their contribution to the film's narrative.

tones with a deceptive character such as Sir John Rowan (Peter Cushing), who murders a young prostitute in *Corruption*, draws parallels with the chromatic costume and lighting designs that represent the dual personalities of Carla / The Gorgon (Barbara Shelley) in *The Gorgon* (Fisher, 1964).

However, the echoes of earlier period horror colour design in these transitional horror films led to a familiar negative critical response, fueled by critics struggling to balance the prevailing association of colour horror as an escapist fantasy with the newer films' use of colour to portray a more brutal contemporary realism. This was most directly addressed in Penelope Mortimer's review of *Corruption* in *The Observer*, which also criticised the British Board of Film Censors (BBFC) for allowing this 'pernicious and repellent rubbish to appear on the screen'. Mortimer's review warns audiences, 'In case anyone should think that this is just a good old horror picture […] Here are no evil fangs, stakes driven through the heart, gaping midnight graves, horrible transformations. The thing actually purports to be realistic.'[21] As the evidence of the films reveals, and as Mortimer's review underlines, overlooking these transitional films ignores a key moment within the British horror genre in which the association of colour / fantasy and black and white / realism was being shattered.

Carry On… in Colour

Unlike the ebb and flow in popularity of horror, comedy has long been 'the most popular genre in British cinema […] drawing mass audiences when other genres fail'.[22] Despite that popularity and dominance, there is no strong association between comedy films and colour in British cinema. To consider how colour remains an underexplored aesthetic aspect of film comedy, this section looks at the British film industry's most successful comedy franchise, the *Carry On* series of thirty films released between 1958 and 1978. Contemporaneous with the Hammer horror films, both series shared a desire to keep 'production costs to levels which were sustainable in British markets alone'.[23] The budget for the *Carry On* series was low even in comparison with other comedies of the time: the first film *Carry On Sergeant* (Gerald Thomas, 1958) 'cost around £73,000 to make, at a time when an average Rank comedy was estimated to cost £125,000'.[24] The different *Carry On* art directors 'were obliged to keep costs down by […] recycling and cheap location matching' including the reuse of standing sets such as a Western town in *Carry on Cowboy* and those built for Twentieth Century Fox's *Cleopatra* (Joseph L. Mankiewicz, 1963) for *Carry on Cleo* (Thomas,

[21] Penelope Mortimer, 'Uplifting Blossoms', *The Observer*, 24 November 1968, p. 23.
[22] Laraine Porter and I. Q. Hunter, 'British Comedy Cinema: Sex, Class and Very Naughty Boys', in *British Comedy Cinema*, ed. by Hunter and Porter (Abingdon: Routledge, 2012), pp. 1–17 (p. 1).
[23] Laurie Ede, *British Film Design: A History* (London: IB Tauris, 2010), p. 74.
[24] Ivi, p. 75.

1964).[25] Although budgetary in nature, such restrictions on set and costume reuse may have actually increased the colour palette available for the films.

Discussions of this series have identified a narrative shift that happens across the 1960s, from institution-set films such as *Sergeant* and *Carry on Constable* (Thomas, 1960) through parodies of British and Hollywood genre films that start with *Carry on Jack* (Thomas, 1964) and run through *Spying* (Thomas, 1964), *Cleo*, *Cowboy*, *Screaming* (Thomas, 1966), *Don't Lose Your Head* (Thomas, 1966), *Follow That Camel* (Thomas, 1966) and *Carry On Up the Khyber* (Thomas, 1968), before the series reintroduced an institutional comedy focus with *Carry On Doctor* (Thomas, 1968).[26] What is not traditionally acknowledged in that production trajectory is the crucial role that Eastman Colour played in the development of the genre parody. The *Carry On* films are rarely celebrated for their cinematography, but the work of Alan Hume on *Cleo, Cowboy,* and *Screaming* is critical in creating the right tone, combining a naturalistic approach with examples of more experimental lighting techniques. *Screaming* uses specific lighting effects to parody (and echo) Hammer's horror films, with a particular colour scheme being used in different rooms: red for the mad scientist's laboratory, purple in the living room, and yellow in the basement where Orlando (Kenneth Williams) and Valeria (Fenella Fielding) Watt create shop mannequins out of female victims. Even away from such an obvious genre connection, Hume's lighting casts an illicit rendezvous in *Don't Lose Your Head* in purple and yellow shades, while green hues suggest a supernatural element to an otherwise comical crystal ball sequence in *Follow That Camel*.

Colour in set designs and costume also enhances the parodies by including contemporary sight gags such as the green-and-gold signage for Marcus et Spencius in *Cleo*, which mimics a similar 'colour scheme as the high street store Marks and Spencer'.[27] The series makes striking use of red and blue in uniforms for *Cleo* (Roman legion)*, Don't Lose Your Head* (French soldiers) and *Up the Khyber* (British troops), allowing the films to both ridicule authority figures and make broad claims to issues of historical accuracy and generic identity. More obvious slapstick gags use colour to set up narrative events, such as in *Cleo* where Caesar's (Kenneth Williams) robes are pelted with red tomatoes, well before the later (largely bloodless) stabbing. Colour in costume is more predictably used to highlight the female body, creating iconic and canonical spectacle: Fenella Fielding's tight-fitting red dress in *Screaming*, Amanda Barrie's skimpy costume in *Cleo*, and Angela Douglas's silver outfit for her song-and-dance in *Cowboy*.

[25] Ivi, p. 78.
[26] James Chapman, 'A Short History of the *Carry On* Films', in *British Comedy Cinema*, pp. 100–115; Sally Hibbin and Nina Hibbin, *What A Carry On: The Official Story of the Carry On Film Series* (London: Hamlyn, 1988), p. 88.
[27] Nicholas J. Cull, '"Infamy! Infamy! They've All Got It in for Me!" *Carry on Cleo* and the British Camp Comedies of Ancient Rome', in *Imperial Projections: Ancient Rome in Modern Popular Culture*, ed. by Sandra R. Joshel, Margaret Malamud and Donald T. McGuire, Jr. (London: John Hopkins University Press, 2005), pp. 162–190 (p. 174).

Throughout the 1960s, the series' increasing interest in half- or wholly-naked women would ultimately lessen the impact of colourful female costumes, but it underlines how important (and often overlooked) colour was to these parodic franchise entries.

Historical Film and the Colour Bio-pic

Both Hammer's period horror films, and the *Carry On…* series' historical parodies, draw from a rich tradition of British costume and historical drama, even though both franchises are generally less concerned with historical accuracy. From the mid-1930s three-strip Technicolor provided an aesthetic feature for historical films which emphasised period spectacle and perpetuated ongoing debates concerning realism and authenticity.[28] This is particularly applicable for the biopic, a sub-genre of the historical film which often engenders accusations of inaccuracy, fraudulence and misrepresentation. The full conversion to colour offered by the new Eastman Colour film stock saw a slow uptake for the biopic when compared to other examples of historical films. In the period 1954 to 1960 only two British colour feature film releases appeared to channel the biopic format: *Beau Brummell* (Curtis Bernhardt, 1954) and *John Wesley* (Norman Walker, 1954). This began to change during the 1960s with *Lawrence of Arabia* (David Lean, 1962), a film that heralded technical advances in colour cinematography and postclassical developments in the genre by adopting a more complex, psychological approach towards the biographical narrative.[29]

Isadora (Karel Reisz, 1969) continued this trend in its exploration of the life of the American dancer, Isadora Duncan (in an acclaimed performance by British actress Vanessa Redgrave). Reisz was better known for his contribution to the critically acclaimed black-and-white social realist films, particularly *Saturday Night and Sunday Morning* (1960), but his debut colour feature has been hailed as a 'marvellously appropriate subject for the 60s'.[30] The film employs a similar temporal framework to *Lawrence of Arabia,* beginning towards the end of Isadora's life, and recreates her experiences as dreamlike encounters fueled with passion and tragedy. *Isadora* adheres to the conventional female biopic tropes of 'suffering, victimisation and failure', played out in the tension between her professional achievements and the demands of 'home, marriage and motherhood'.[31] However, the film explores Isadora's complex persona by adopting a psychologically-centred narrative which is fragmented and

[28] Claire Monk and Amy Sargeant, 'Introduction: the Past in British Cinema', in *British Historical Cinema*, ed. by Monk and Sargeant (London: Routledge, 2002), pp. 1–14 (p. 2).
[29] Dennis Bingham, *Whose Lives are They Anyway? The Biopic as Contemporary Film Genre* (USA: Rutgers University Press, 2010), pp. 72–99.
[30] Robert Murphy, *Sixties British Cinema* (London: BFI, 1992), p. 271.
[31] Bingham, pp. 10 and 213.

impressionistic. This approach is underscored by considered colour choices in the film's creative design.

Film and stage designer Jocelyn Herbert was employed to create the look of *Isadora*, and her personal archive reveals some of the colour challenges production personnel faced due to the non-linear structure. These were related to physical changes in Isadora's (and Redgrave's) appearance and in crafting aesthetic contrasts between different time periods. In her sketchbook, Herbert considers: 'going on the assumption that the past and present are going to be different — how and to what degree?'[32] She debates whether Isadora's past should be filmed in black and white or colour to evoke a time that was more 'vivid and alive' and to recreate the 'garish and fun' sentiment of the 1920s.[33] Black-and-white cinematography which had previously 'reinforced dominant generic codes of realism' is assessed here in a very different context: as a signifier for the past and reconstructed memory.[34] The finished film follows Herbert's latter idea by employing vivid colour for most of the flashbacks, accentuating the subject's life story and reinforcing colour as spectacle.

It begins with twelve-year old Isadora in her parents' bedroom, the muted browns and flickering candle light creating a silent film effect that emphasises this is a different era. The action then shifts in time as she recites her memoirs whilst staying on the French Riviera in 1927. As Isadora's stage routines become more flamboyant and outrageous, her costume changes from predominantly white, promoting classical ideals, to fiery reds and oranges. Herbert's set designs, inspired by her work at the Royal Court, include sparse studio interiors decorated with minimalist furnishings, providing a theatrical ambience that reflects Isadora's artistic ambition. The apartment she shares with her first love, the English theatre designer Gordon Craig (James Fox), resembles a stage set: an expansive space in which to experiment with colour and light. The warm orange glow of these early sequences reflects Herbert's suggestion that Isadora's past should be presented as more 'vivid'. Later scenes shift from the romantic and opulent French château where Isadora sets up a dance school for girls, through to the grey, sombre tones of Soviet Russia, punctuated by brazen displays of red costume, flags and regalia (defiant until the end, Isadora also wears a scarlet red scarf at the moment of her untimely death).

Isadora presents an evocative biographical film where colour performs a significant symbolic role in depicting the subject's psychological journey. This is in contrast to earlier black-and-white biopics such as Ken Russell's *Isadora Duncan: The Biggest Dancer in the World* (BBC, 22 September 1966), with Reisz's film version offering a stronger visual resonance through its chosen colour palette. As with the horror films discussed above, colour increased the creative

[32] *Isadora* Folder (d.1967-1968), Jocelyn Herbert Collection, National Theatre Archives [accessed 23 May 2017].
[33] Ibid.
[34] Street, *Colour Films in Britain*, p. 132.

opportunities for filmmakers working in this genre, fueled by the broader move towards more psychologically-driven narratives. The input of practitioners such as Herbert helped shape the visual direction of mid-century British historical biopics, a direction that continued after the complete conversion to colour by the end of the 1960s.

Conclusion

Between the years 1954 and 1969, as Eastman Colour entered its period of mainstream adoption, it is clear that the British film industry was coming to terms with the new aesthetic possibilities of colour. As the case studies demonstrate, a focus on Eastman Colour in British cinema has begun to reveal how colour helped redefine the look of key British genres. While this period remains critically known for the monochrome and 'realist' films of the British New Wave, the new perspectives developed in our project contribute to scholarship aiming to challenge and expand that narrow historical view.[35]

The case studies reveal how this British period of colour transition and experimentation can be linked to shifting cultural connotations of realism, character psychology, parody, and social commentary. The British industry was also reliant on colour for more prosaic reasons: most films from America and other countries were in colour from the early 1960s, and the rise of British-American film and television coproduction through the 1960s (in part due to London's 'Swinging Sixties' pop culture reputation) meant Britain needed to convert to colour to keep in step with international colour trends. Other media were also converting to colour, with advertising, publishing, fashion and television offering alternative chromatic opportunities. Such intermedial influences (and challenges) meant Eastman Colour became mainstream in British film production around the same time as colour supplements appeared in newspapers, and as colour broadcasting appeared in Britain. BBC2 began broadcasting in colour from 1967, BBC1 in November 1969, and the regional commercial channels between 1969 and 1970. These initial mid-century years of experimentation, then, can be seen as an essential transition period for the British film industry but also one in which it was engaged in a complex negotiation with intermedial chromatic trends.

Beyond this period, colour remains a complex and shifting topic in terms of aesthetics, industry attitudes, and the realist canon. Hammer and the *Carry On...* series continued into the 1970s, with period horrors like *Lust for a Vampire*

[35] See, for example, Pam Cook, *Fashioning the Nation: Costume and Identity in British Cinema* (London: BFI, 1996); Sue Harper, *Women in British Cinema: Mad, Bad and Dangerous to Know* (London: Continuum, 2000); *British Horror Cinema*, ed. by Julian Petley and Steve Chibnall (London: Routledge, 2001); Chibnall and Brian McFarlane, *The British 'B' Film* (London: BFI, 2009); *British Comedy Cinema*; *Ealing Revisited*, ed. by Mark Duguid, Lee Freeman, Keith M. Johnston, and Melanie Williams (London: BFI Palgrave, 2012).

(Jimmy Sangster, 1971) or genre parodies such as *Carry on Henry* (Thomas, 1971) attempting to recapture the elusive commercial success of the 1960s. Contemporary psychological horrors offered a more pared-down realism in films such as *Fragment of Fear* (Richard C. Sarafian, 1970) or *The Shout* (Jerry Skolimowski, 1978), while the Hammer-inspired colour tradition was continued by low budget horrors such as *Frightmare* (Pete Walker, 1974) and *Virgin Witch* (Ray Austin, 1972). The historical biopic, meanwhile, became a key site of chromatic experimentation in the films of Ken Russell, most notably in *The Music Lovers* (1970) and *Valentino* (1977). The acceptance of colour in social realism across the 1970s may lack some of the commercial critique found in earlier films, but realist directors such as Mike Leigh and Ken Loach continued to use colour effectively as they moved between television and film projects such as *Bleak Moments* (Leigh, 1971) and *Family Life* (Loach, 1971). While those realist traditions continue to echo through debates about a British film canon, the parallel history that our project is uncovering demonstrates how colour may be key to revealing a 'richer and more diverse British cinema'.[36]

[36] Barr, p. 14.

The Colour Revolution: Disney, DuPont and Faber Birren

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> Meanings, like colors, express neither truth nor value if they are separated from the various modes in which they are 'given' or taken away. These modes are connected to forms, to techniques, to the manual history of production. In practice, colours subsist in a relationship of simple correspondence or cause, connecting how they are seen with how they are produced.
>
> (Manlio Brusatin, *A History of Colours*)

Abstract

This paper explores the professional cross-connections between the Walt Disney studios, who pioneered the early adoption of Technicolor IV, DuPont, whose chemical research provided the colour pigments and Pyralin cels used in Disney's films, and Faber Birren, one of the most influential corporate American consultants in colour design and marketing. It considers several aspects of colour that have not previously been considered in colour or animation studies: first, the material history of cellulose nitrate and acetate and its structural and aesthetic relationship to colour and transparency in animation; second, the role that colour paints and pigments developed by the DuPont company played as part of its targeting of Hollywood as a strategic new market, and third, the ways in which colour production was aesthetically informed by colour consultants like Birren across multiple realms, from cinema to interior design and architecture. By considering how colour production and design was situated within larger corporate strategies at DuPont in which colour was key to its industrial and consumer markets, I hope to enrich our understanding of the role that Disney, DuPont and Faber Birren played in the colour revolution of the mid-twentieth century.

Colour cinematography and the Ink and Paint department were key attractions in Disney films, while also playing a spectacular narrative role in features like *Snow White and the Seven Dwarves* (Dave Hand, 1937) and *The Reluctant Dragon* (Alfred Werker, 1941). Celebrating its new colour range in Technicolor, Disney's promotional rhetoric emphasized its material colour production as expensive,

exotic and luxurious.[1] In a 1930s Disney press release, colour's aesthetic quality was emphasized: 'In seeking perfection in colour reproduction Disney technicians have […] developed paints which in beauty and reliability excel all watercolours of the past',[2] and celebrated onscreen in *The Reluctant Dragon*'s 'Rainbow Room', in a montage sequence devoted to the Disney Ink and Paint department's transformation of prodiegetic pigments and paints into the final colour image. From its first Silly Symphony in colour, *Flowers and Trees* (Burt Gillett, 1932), colour was a value that marked Disney's product as qualitatively different from earlier two-strip subtractive color processes in animation like Technicolor III, Multicolor or Harriscolor, or the later Cinecolor.[3] With an exclusive contract for Technicolor IV between 1932–34, Disney produced cartoons with a new colour palette that no other cartoon studio could match.[4] With complementary (red and green) and triadic colour schemes (red, blue and yellow) in narratives where toys, candy and Christmas were frequent devices for expressive display in its Silly Symphony series, like *The Night Before Christmas* (Wilfred Jackson, 1933) or *The Cookie Carnival* (Ben Sharpsteen, 1935), Disney also offered a more nuanced pastel palette in the feature film *Snow White*, with light browns, blues and greens.[5] In its animated stories, the studio imagined colour's material production process as magical, even transgressive, with off-screen gender and labor practices sometimes shaping on-screen representational practices.[6] For example, in *Snow White*, the Wicked Queen uses coloured liquids to transform her beautiful surface into an ugly hag, musing to herself: 'Now… a formula to transform my beauty into ugliness, change my queenly raiment to a

[1] For more information on Disney's Ink and Paint Department's use of colour paints and pigments, see Kirsten Moana Thompson, '"Quick—Like a Bunny!". The Ink and Paint Machine, Female Labour and Color Production', *Animation Studies*, 9 (February 2014), <https://journal.animationstudies.org/kirsten-thompson-quick-like-a-bunny/> [accessed 6 February 2019].

[2] 'Premium' (Walt Disney Studios Press Release, [n.d]). Walt Disney Clippings, 1938–1946, Publicity Ephemera, UCLA Performing Arts Collection.

[3] James Layton and David Pierce, *The Dawn of Technicolor, 1915–1935* (Rochester, NY: George Eastman House, 2015), pp. 268–77.

[4] Ted Eshbaugh made an important early Technicolor IV test cartoon, *Wizard of Oz* (1932–33), that was never theatrically released. John McElwee, 'A Cartoon Pioneer We've Forgotten', 21 October 2014, Greenbriar Picture Shows, <http://greenbriarpictureshows.blogspot.com/2014/10/a-cartoon-master-weve-forgotten.html> [accessed 6 February 2019].

[5] A British writer described it this way: 'The new Technicolour [sic] gives clear full yellow, pale blue that is clean. Light browns as well as dark browns; rich ivy green besides emerald and olive. The lightest of colours are possible, shell pinks, the strange greens of layers of water, lily white.' Robert Herring, 'The Cartoon Color-Film', *Close Up*, 10, March 1933, p. 86.

[6] See Thompson, 'Colorful Material Histories: the Disney Paint Formulae, the Paint Laboratory and the Ink and Paint Department', *Animation Practice, Process and Production,* 4.1 (2014), 45–66. For an expanded discussion of the gendered labor practices of colour production as transgressive femininity, see Thompson, '"Quick—Like a Bunny!"'. Like *Snow White*, contemporary artist Sarah Maple's photographic installation *Snow White the Scientist* (2011) underscores the transgressive connection between femininity and colour production as part of her *Princess Series*, which reimagines Disney heroines in modern workplaces, <https://www.sarahmaple.com/paintings-2/#/new-gallery-4> [accessed 6 February 2019].

peddler's cloak. Mummy dust to make me old; to shroud my clothes, the black of night; to age my voice, an old hag's cackle; to whiten my hair, a scream of fright; a blast of wind to fan my hate; a thunderbolt to mix it well; now begin thy magic spell.' The Wicked Queen's spell showcases colour's materiality as transformative agent, while it also alerts us to the connection between cosmetic surface and normative ideas of femininity and beauty. As she bathes a red apple in a poisonous cauldron of sickly green colour, advising us: 'Look on the skin! The symbol of what lies within!', her transformation has also exposed the Queen's literal and metaphorical ugliness. This diabolical corruption by means of colour links the scene to a long philosophical tradition (*disegno vs colore*) in which colour was considered to be a lapse from normative classicism and in which form and line were privileged over hue. In a parallel laboratory scene in *The Worm Turns* (Ben Sharpsteen, 1937), Mickey Mouse, wearing bright red gloves and a white lab coat, is working late at night on a secret formula called the Courage Builder ('The Weak Made Strong'). In striking staging with dramatic shadows and meticulous attention to shadow and light, Mickey is surrounded by flasks, beakers and test tubes in highly saturated hues of reds, greens, blues and purples. In pursuit of his magic formula, Mickey pours coloured liquids from beaker to test tube, each time producing bubbling, sputtering and sparking puffs of colour (with automobile sound effects) as the experiment progresses. While colour is certainly verisimilitudinous, marking Disney's distinctive attention to the lighting and materiality of liquids and glass, what is ultimately staged is the spectacular relay of transforming colours, the sensual seduction of Technicolor candy ready for us to visually consume. Here the supernatural storyline is a narrative pretext to foreground colour *as colour*, as transparent as the laboratory glassware. From the scintillating gems in the Seven Dwarves' diamond mine to the Wicked Queen's poisonous-red apple in its bubbling cauldron, colour was in constant transformational movement, from liquid to gas to solid: it was *animated.*

In pioneering the early adoption of Technicolor IV in the film industry, well before most major studios took up the new colour process, the Disney studio played a vital role in the colour revolution,[7] as a key site for the increasing dissemination of colour in many aspects of popular culture and everyday life.[8] In a similar fashion, the DuPont Corporation also played a critical role through its research and manufacture of synthetic dyes, pigments, plastics and paints for industrial and consumer use, that in turn helped reshape business and retail in the late nineteenth and early twentieth century. Beginning in the early 1920s, and as part of its strategic targeting of Hollywood as an important market, DuPont

[7] Regina Lee Blaszczyk, *The Color Revolution* (Cambridge, MA: MIT Press, 2012).

[8] Of the extensive body of literature on Disney, key texts on colour include Richard Neupert, 'Painting a Plausible World: Disney's Color Prototypes', in *Disney Discourse: Producing the Magic Kingdom*, ed. by Eric L. Smoodin (New York: Routledge, 1994), pp. 106–17; 'A Studio Built of Bricks: Disney and Technicolor', *Film Reader*, 6 (April 1985), 33–40; J. P. Telotte, *The Mouse Machine: Disney and Technology* (Urbana: University of Illinois, 2008), and Esther Leslie, *Hollywood Flatlands: Animation, Critical Theory and the Avant-Garde* (London: Verso, 2002).

provided two key materials to Disney as the studio produced its cel animation and later expanded into colour in 1932: first, the transparent nitrate (and later acetate and plastic) cels under the name of Pyralin, and second, Monastral pigments used by Disney to manufacture its in-house paint for the final artwork produced on these cels. Led by colour consultants like Howard Ketcham and Faber Birren, whose philosophical and psychological understandings of colour informed the range and palette of its product line, as well as its marketing to consumers, business and government, DuPont in turn helped transform twentieth century colour, from interior design to textiles, lighting and architecture. As two leading corporations in American manufacturing and entertainment, DuPont and Disney offer a useful case study for understanding the complex intersections of material history and aesthetic design that shaped visual culture in the colour revolution.

As with live action cinema, the role of colour in cel animation is a complicated one. The luminosity, hue and saturation of animated colours on screen was shaped by the use of specific prodiegetic materials, from the types of nitrate or acetate cels used as inked and painted surfaces for the artwork, to the pencils, pastels, chalks, watercolour or oil paints. The lighting conditions employed to photograph the cels and the type of platen glass under which they were photographed, all affected the clarity, value and saturation of the artwork's colours, as did the cinematographic processes in which these cels were then photographed and printed, from Cinecolor to Technicolor IV. The conditions under which the films were projected, from ambient illumination to the light bulbs, lens and focus of the projector, also affected the sharpness and brilliance of the colours exhibited, as Disney was all too aware.[9] Finally, the specific properties of the production materials manufactured by DuPont also enabled or restricted the colour range of Disney's prodiegetic artwork.

DuPont and Disney's Material Relationships

Founded on the gunpowder mills established on the Brandywine River by E. I. du Pont de Nemours in Wilmington, Delaware in 1802, the DuPont corporation would become a huge conglomerate by the twentieth century, developing or buying the patents for Nylon, Kevlar, Teflon, Lycra and hundreds of other chemicals, and establishing major industrial and consumer lines in explosives, insecticides and fungicides, rubber chemicals, dyestuffs, paints and pigments.[10] Many DuPont products stemmed from similar roots, beginning with a twentieth

[9] For Disney's efforts to educate projectionists, see Paul Cramer, 'Cooperative Job Ahead', *Projection*, 10 (1938), 22–26.

[10] E. I. Du Pont de Nemours & Company, *DuPont: The Autobiography of An American Enterprise: The Story of E. I. Du Pont de Nemours & Company* (New York: Scribner/Simon and Schuster, 1952) and Alfred Du Pont Chandler and Stephen Salisbury, *Pierre S. Du Pont and the Making of the Modern Corporation* (New York: Harper, 1971).

Fig. 1: *Better Living Through Chemistry* (Hagley Library, 1946 Pamphlet)

century expansion shaped by the huge range of products derived from one key raw material, cellulose, or the fibre from the cell walls of plants. Different treatment methods of cellulose with nitric (and later, acetic) acid led to a huge range of diverse products, encapsulated by its slogan 'Better Things for Better Living… Through Chemistry', including DuPont cellophane, celluloid film, Duco (an enamel that coated colours to cars), Rayon and Pyralin (fig. 1).

In 1915 DuPont acquired the Arlington company, a manufacturer of tortoise shell combs who had created a synthetic plastic called Pyralin in 1883. With the acquisition of the Viscoloid Co. in 1925, together these would form the core of DuPont's Plastics division (founded in 1936), which specialized in manufacturing a wide variety of consumer goods, from women's hairbrushes to war munitions and cellophane.[11] Around 1911, as an effect of the popularity of bobbed hair,

[11] Viscoloid Co. 1926–1928. Trade Catalogues, Box 4 and Public Affairs Department Records, 1915–1981, Hagley Library.

the combmaking industry faced declining sales, and with the First World War faced additional shortages in raw materials. In 1912, DuPont's monopoly on the explosives industry ended with an antitrust decision that forced the company to diversify, and, for all these reasons, DuPont started to expand its products to new markets and users, particularly the film industry.[12]

DuPont Pyralin

Like both Kodak and Technicolor, DuPont's research laboratory was key to the company's growth,[13] and with selective poaching of British chemists from its competitors, DuPont began manufacturing positive film, as well as panchromatic and orthochromatic negative film in 1925. DuPont base film stock was developed from nitrocellulose, but its gelatin film emulsion was created from animal products like ossein (the collagen produced from cattle and buffalo bones), splits (the inside layer of cattle skin), calfskin and porkskin. In other words, the materiality of DuPont cinematic products had a direct, indeed structural relationship to the plant and animal worlds through their simulation or literal incorporation of plant or animal products into their material bases, but also in their use as aesthetic surface for the representation of flora and fauna in films like *Fantasia* (Wilfred Jackson, 1940), *Dumbo* (Ben Sharpsteen, 1941) and *Bambi* (Dave Hand, 1942). DuPont's transparent Pyralin or Pyroxylin plastic film (without the gelatin emulsion) was marketed in 1920 as the 'material of a thousand uses',[14] and was a new synthetic plastic which could mimic dozens of natural products from ivory to tortoiseshell and leather, a distinctive feature of what Jeffrey Miekle calls 'celluloid's powers of mimicry'.[15] Pyralin was manufactured in tubes, rods or sheets and could be bonded to metal, wood, plastic and glass. Providing insulation against heat, cold and sound, it had a high structural strength. Pyralin and the later acetate plastic or 'Plastacele' were non-flammable and were widely used in consumer devices from fountain pens to toothbrushes, combs, piano keys, poker chips, eyeglasses and toiletry products. In its transparent form, it was used in lantern slides, automobile safety glass and lampshades, while the company also boasted that 'Pyralin is available [...] — in hundreds of colour effects and colour combinations — Ivories, Jades, Shells, Pearls, Mahoganies — all are truly duplicated in Pyralin'.[16] In the form of

[12] Luci Marzola, '"Better Pictures Through Chemistry": DuPont and the Fight for the Hollywood Film Stock Market', *Velvet Light Trap,* 76 (Fall 2015), 3–18 (p. 7).
[13] Marzola, pp. 8 and 10.
[14] *DuPont Advertisements* (Wilmington, DE: Du Pont de Nemours, 1920), p. 6, 'Collection of Nine Folders Illustrating the Advertisements of Pyralin', Hagley Library.
[15] Cited in Nicole Shukin, *Animal Capital: Rendering Life in Biopolitical Times* (Minneapolis: University of Minnesota Press, 2009), p. 108.
[16] 'What Next Will Be Made of Pyraline?' Pamphlet (Arlington, NJ: DuPont Nemours, c.1920), Pyralin Dept, Trade Literature, 1926–1928, Hagley Library.

thin sheets called cels, Pyralin was lightweight and abrasion resistant, offering a temporary surface on which artwork could be painted and then photographed frame by frame, to create the illusion of movement in animation. Colourlessness and transparency were essential properties ensuring maximal legibility of the vibrancy of the colours painted on the palimpsest of cels and background paintings, while the additional benefits of flexibility and durability afforded by plasticizers ensured that the cels could withstand the manipulations of inkers, painters and camera operators.[17]

Not only was Hollywood a market for DuPont products like Pyralin, but it was also a means by which DuPont promoted the value of its products to other potential customers. In February 1923, 'Pyralin's Unique Use in the Movies' appeared in *The DuPont Magazine* featuring Bud Fisher's popular animated characters Mutt and Jeff from DuPont's client, the Raoul Barré studio, along with illustrations provided by *Scientific American* editor and author of the *Cinema Handbook* A. C. Lescaboura.[18] Although Disney is not mentioned at this early stage, Laugh-o-Gram bankruptcy records show that at least as early as 30 November 1923 DuPont was already a supplier, with Disney invoiced for an unpaid bill for 200 20" x 50" sheets of Pyralin.[19] By December 1934 in *The DuPont Magazine*, Hazel Sewell, head of Disney's Ink and Paint department, appeared in a photo promoting a Pyralin cel of Mickey Mouse, and in the very next issue in February 1935, in 'Behind the Scenes with Mickey Mouse', DuPont used Disney's popular new character to advertise Pyralin's suitability for animation. By 6 September 1938 in another trade magazine, DuPont advertised Pyralin through its use on the recently released feature *Snow White,* with the company also offering customer service teams to 'cooperate with you in determining how Pyralin may be used practically and usefully applied in solving problems pertaining to your business'.[20] Meanwhile, correspondence in the 1930s between Disney and DuPont show the studio's increasing production demands of *Snow White*, with DuPont accommodating them by decreasing the size and width of the Pyralin plastic cels to 10″ x 12″ x 1/16″ at Disney's request.[21]

[17] Because of these plasticizers, the surface of the artwork eventually became an unstable chemical compound subject to cracking, chipping and degassing. Kristen McCormick and Michael R. Schilling, 'Animation Cels: Preserving a Portion of Cinematic History', *Conservation of Plastics* (Spring 2014), 1–7.

[18] 'Pyralin's Unique Use in the Movies', *The DuPont Magazine*, 17.2, February 1923, p. 5.

[19] Michael Barrier, *The Animated Man: A Life of Walt Disney* (Los Angeles: University of California Press, 2007), p. 335n; Timothy Susanin, *Walt Before Mickey: Disney's Early Years, 1919–1928* (Jackson: University of Mississippi, 2011), p. 242n. Animator Rudy Ising confirmed DuPont decreased cels to 1/16″.

[20] Photo in *The DuPont Magazine*, 28.12, December 1934, p. 10; R. T. Ellis, 'Behind the Scenes with Mickey Mouse', *The DuPont Magazine*, 29.1–2, February 1935, p. 5; Advertisement for *Snow White*, 6 September 1938, courtesy Russell Merritt, 2015.

[21] 'Animation's Volatile Relationship With Plastic', 1 June 2015, <https://d23.com/getty-animation-research-library/> [accessed 6 February 2019].

DuPont Colour

DuPont also promoted its other nitrocellulose products to the film industry, from nitrate and replacement safety film to explosives for clearing land for movie production, and even lacquer paint for set design and movie props.[22] In 'Lacquer's Screen Career', DuPont's trade literature suggested that its colour paint on the sets of Cecil B. DeMille's 1934 production *Cleopatra* signified quality and luxury, and by extension, that DuPont colour was part of the glamour of Cleopatra's court *and* of Hollywood.[23] Even though *Cleopatra* was shot in black and white, the high sheen of DuPont's expensive colour paint offered high production values, and as its advertising suggested, transformed cheap props and sets into expensive objects. DuPont even developed a tool to ensure this glossiness and measure the reflection of light in its paints, lacquers and varnishes with the Pfund Glossimeter. Additionally, *The DuPont Magazine* noted that, even though the lacquer was not visible as colour *on film*, it nonetheless helped promote a psychological effect of 'realness' in the actors: 'Realistic backgrounds and "props" assist the players to throw themselves into their roles, to get the feel of their parts. The rich trappings, glittering colours and highlighted accoutrements of the Romans all served to intensify the mood of pageantry in pictures like *Cleopatra*.'[24] In this respect, DuPont trade ads repeatedly emphasized Pyralin and Duco paints' quality to justify their expensive pricetag: 'best — because they have no settling in the can, the pigment being permanently suspended in the solution', said one 1920s ad for Pyralin Enamels.[25]

Supervising colour design of a number of DuPont divisions, including Duco paint from 1927 to 1935, was DuPont's 'colour engineer' Howard Ketcham, before he became a freelance colour consultant to Pan Am, General Electric and other corporations. Ketcham standardized and simplified DuPont's automotive Duco colour line, radically reducing it from 11,500 down to 290 colours, adopting Munsell's colour system of hue, chroma and value and reinforcing DuPont's promotion of colour with quality. Between 1935 and 1940, Ketcham consulted with DuPont to design coloured plastic Pyralin for bathroom products like mirrors, combs and makeup containers. In 'Rare Colors Revived', *DuPont Magazine* explicitly linked Ketcham's designs with craft traditions of luxury and quality in English and American marble glass, observing that 'Regency period "Pyralin" faithfully simulates in color and tone value this early American glass, a triumph for Howard Ketcham and

[22] 'How Mighty is Dynamite?', *The DuPont Magazine*, 28.11, November 1934, pp. 1 and 16.
[23] Laing, 'Lacquer's Screen Career', *The DuPont Magazine*, 29.1–2, February 1935, pp. 8–9 and 24; D.V. Gregory and A.V. Wetlaufer, 'How Glossy is Glossy?', *The DuPont Magazine,* 24.4, April 1930, p. 18.
[24] Laing, pp. 9 and 24.
[25] 'DuPont Pyralin Enamels: Best for Non Breakables', *DuPont Advertisements,* Group A, papers 4 & 5, Hagley Library.

the craftsmen of the DuPont Viscoloid Co. Inc. for they have reproduced in boudoir accessories the most prized colors'.[26]

Ketcham's colour design across the DuPont product line was in keeping with the corporation's transmedial promotion of its plastics, pigments and textiles as quality and luxury goods. Pyralin's toughness and durability, as well as the brilliancy of DuPont Duco enamel paint made it particularly suitable for quick-drying automotive paint finishes, but also as lamination on superior toys for children. In an advertisement for Pyralin enamel toys in 1920, DuPont acknowledged that 'they cost more than any enamels made — but they deliver more in quality and covering, most per dollar of cost'.[27] Similarly, rubber toys of Disney characters like Pluto, Ferdinand the Bull and the Three Little Pigs, made by Seiberling Latex Co. of Akron, OH, also used DuPont chemicals and laminated colours and were featured in trade literature, demonstrating the embedded material continuum between on- and offscreen Disney characters and the DuPont corporation.[28]

DuPont and Disney's material relationship extended from plastics into black-and-white and colour pigments. Disney established an Ink and Paint department in its very first studio in Kingswell in 1923, led by supervisor Hazel Sewell. A problem encountered by all animation studios was that off the shelf Grumbacher paints failed to adhere to the slippery surface of the DuPont nitrate cels, and eventually specialized manufacturers like the Catalina Color Co. (later Cartoon Colour Co.) would emerge to supply the animation industry with speciality paints that would adhere to these surfaces. However, unlike Warner Bros. and MGM, the Disney studio shifted to manufacturing its own paint as it was cheaper to buy the pigments from suppliers like DuPont and produce in bulk on the studio lot.

Made by the women of the Ink and Paint department with the assistance of a specialized laboratory, paint was manufactured following colour formula index cards, together with their specific 'letdowns', or lighter or darker tints which compensated for the multiple cel layers that made up the composite artwork of cel animation. Comparisons between the paint product codes on Disney's colour formula cards and *DuPont's Standard Pigment Colours* (Wilmington, DE: Du Pont Nemours, 1941), reveal these pigment preferences. Having acquired the Krebs Company in 1929 which specialized in lithopone and titanium dioxide, DuPont specialized in the bulk of Disney's most vibrant colours.[29] The brilliancy of DuPont pigments included chrome yellows, chrome greens, iron blues,

[26] 'Rare Colors Revived', *The DuPont Magazine,* 29.10, October 1935, p. 20.
[27] *DuPont Advertisements* (Wilmington, DE: DuPont Nemours, 1920), Hagley Library.
[28] 'Toyland Telegraph' Advertisement for Seiberling Latex Co., *The DuPont Magazine*, 31.11, November 1937, p. 1; *The DuPont Magazine*, 33.1–2, February 1939, p. 15; *The DuPont Magazine*, 33.12, Holiday issue, 1939, p. 12.
[29] The formula cards also indicate other suppliers, including Hoover, especially for browns and blacks; SCM (for yellows, and cadmium reds); Harcros/Pfizer (for the oxide reds, yellows and greens) and Mobay (formerly Harmon) and Imperial/Harshaw for certain reds (MV6606 or Red 88; MX686 or Red 83).

organic lakes and toners, particularly Pthalocyanine blue (BT-297 D) or Platinum Violet (BP-273-D) or Monastral blue, which were used for rich detailing like the Queen's and Snow White's purple and blue costumes in *Snow White*.[30] By 1953 DuPont also offered new pastel hues derived from titanium dioxide, such as blue-green, copper, pink and rose that cut across product lines, from automobiles to telephone handsets, printing inks, floor coverings and textile fibres.[31]

Disney's initial colour formula recipes were based on the Munsell colour system. After the shift in 1939 to the new Burbank studio, the Color Paint Lab, headed by Mary Weiser and Production Process Laboratory headed by Emilio Bianchi, were established. Disney employee Herman Schultheis described the colour production process in this way:

> The paints are mixed in the paint lab at the studio from formulas by trained chemists. Pigments (animal, vegetable and mineral) are ground and mixed. Several hundred hues with 7 values each (from dark to light) are kept here. Inharmonious colours are avoided and pastel shades are used mostly. Color schemes have to be changed when character moves from sun into shadow, etc.[32]

Disney's opaque paint had a much higher quotient of gum arabic, in comparison to Warner Bros.' unstable casein-based paint. Its textural thickness made the paint adhere to the cel and gave it a jewel-like quality because the pigments would sink to the bottom adhering to the cel, with the paint above it, so the colour was against the cel, enhancing its intensity.[33] As my previous research has shown, the colour formulas confirm that there was a qualitative difference in Disney paint: its colours were more brilliant because of its vibrant DuPont pigments, while its technical application was easier because of its greater viscosity and elasticity.[34] Not only did DuPont supply key materials that helped create Disney characters both on- and offscreen, and also use the animation industry to cross promote its own product lines, it also influenced Disney colour aesthetics through its own colour consultant. Thus far, we have seen that Disney's use of DuPont Pyralin, pigments and paints demonstrated the studio's insistence on quality and vibrancy in its prodiegetic materials, enriching the artwork photographed by its Technicolor cameras that would in turn position

[30] Colour Laboratory and Ink and Paint Department Historical Material. Personal Collection, Lew Stude and interviews 1 May 2014, transcript, pp. 1–30, and 1–3 August 2015, transcript, pp. 1–72, Burbank, CA.
[31] Emily Heine, 'Color Sells Itself', *The DuPont Magazine*, 51.2, April–May 1957, pp. 2–5.
[32] John Canemaker, *The Last Notebook: Herman Schultheis and the Secrets of Walt Disney's Movie Magic* (Los Angeles: Walt Disney Family Foundation Press, 2014). All paint consists of three major ingredients: the pigment (or hue), the vehicle or base in which the pigment is suspended (oil or water), and the binder, which can offer gloss, elasticity or strength. In addition there are often softeners for pliability and humectants to attenuate drying.
[33] Stephen Worth interviews 30 April 2014, transcript, pp. 1–37, and 13 August 2015, transcript, pp. 1–28 and correspondence, Pacoima, CA.
[34] Thompson, 'Colourful Material Histories', p. 55.

Disney as an innovative technological leader in the use of colour in Hollywood and animated film markets. Manufacturing its paints in bulk from DuPont pigments not only saved Disney money, but also afforded it creative control to broaden and nuance its rich colour palette for its feature films, while also using colour as an important brand signifier of aesthetic value and spectacle. Similarly, DuPont's targeting of the Hollywood film industry was an important part of the company's broader diversification of its products, from celluloid to lacquer paint, in which DuPont marketed its goods as indices of aesthetic luxury and value, while also using the glamour of its association with stars like Mickey Mouse to cross promote itself to other business. For both Disney and DuPont, colour played a central role in their promotional strategies to differentiate themselves in the marketplace. DuPont was a leading producer of the synthetic raw materials for the consumer goods and services that would feed the colour revolution, from interior design to architecture, textiles and printing, while Disney's early adoption of synthetic colour marked them out as an innovative producer of the entertainment industry in colour. Each company would come to use the services of a leading colour engineer, designer and philosopher in that colour revolution named Faber Birren (1900–1988).

Faber Birren and Colour at Work

As part of Walt Disney Studio's newly established internal training program, in which notable scholars, artists and teachers offered lectures for its animation workers, leading colour consultant Faber Birren delivered ten talks at the studio over two weeks in early 1939, which discussed 'the history, science, psychology and modern applications of colour'.[35] The author of forty books and 254 articles on colour, Birren founded American Color Trends, a notable pioneer in industrial colour design that consulted for factories, hospitals, schools and companies, including DuPont, Monsanto, Allied Chemical and General Electric. To enhance productivity and safety in factories, Birren developed a colour coded system (orange for alerts, green for safety equipment, yellow for hazards, blue for caution, and so on) and also produced similar colour protocols for the US Navy, Army and Coastguard. His pioneering work understood that functionalist colour design minimised eye fatigue, maximised visibility and directed visual attention, producing an unconscious form of automatic response in the worker: 'the trick is to establish a seeing condition that automatically, in and of itself, makes the task easier'.[36] Birren also specialized in the psychological effects of colour design, advising how changing hues could help advertising and businesses

[35] Birren, 'Color Preferences', 20 April 1939, Disney Development Program, 7 pages, in Don Hahn and Tracy Miller-Zarnecke, *Before Ever After: The Lost Lectures of Walt Disney's Animation Studio* (Los Angeles: Disney Editions, 2016), pp. 286–293 (p. 286).
[36] Birren, 'Color in the Plant', *The DuPont Magazine*, 39.4, 1945, pp. 10–16.

through guest talks, trade literature and journalism.[37] Citing Matthew Luckiesh, an expert on the relationship of colour and light, Birren noted that colour design must account for the reflection of light: 'As Dr Luckiesh, a noted authority in the lighting field phrases it: "High visibility, ease of seeing and good seeing conditions are overwhelmingly the result of good brightness engineering".'[38] Designing a 'Color Conditioning' program for DuPont that examined the psychological effects of colour in industrial and consumer spaces like factories and offices,[39] Birren made specific recommendations for changes in hue, in order to enhance consumer appetite and increase spending; in his words, 'color has become a valuable *worker* on the plant pay roll [sic]' [emphasis added].[40] He even suggested pigment shades like a purple colour for a fertilizer spreader to look 'appropriately springlike in a home garden setting'[41] (fig. 2).

Once a student at the Art Institute of Chicago, Birren's colour preferences were strongly influenced by the theories of Ewald Hering and Wilhelm Ostwald, and his consulting for both Disney and DuPont emphasized the ways in which colour perception played an active role in colour preferences that was rooted in our own physiology.[42] Like Howard Ketcham, Birren is an important figure who links the corporate world of industrial and consumer mass production to art, through his close focus on psychology and cultural and historical understandings of colour aesthetics. Birren's lecture 'Color Preferences' delivered on 20 April 1939 at Disney drew from his recently published *Monument to Color* (1938) and was supplemented by demonstrations to the Disney artists of 'paints, lights, and other materials, making his teachings visible, memorable, and most importantly, true to color'.[43] Birren's colour theories built from his training in art history, discussing, for example, how the chiaroscuro work of da Vinci or Rembrandt revealed their intuitive understanding of hue, light and shadow. From these artistic practices, Birren developed his own theories of colour harmonies that were built around tints, tones and shades. Influenced by Hering's triangular chart of colour, which placed hue on one angle, white on the second and black on the third, as well as theories by Ostwald, who distinguished between colour as light and colour as surface pigment, Birren developed a colour chart that mapped these principles in a triangle made up of seven forms (hue, white, black, tint, shade, tone, gray), for his ultimate goal was the systematization of colour harmonies that could be deployed in mass culture: 'Good color in industry, in products and commodities of everyday consumption, is high art. It is art spread

[37] Birren, 'Color and You', *The DuPont Magazine*, 42.3, March 1948, pp. 16–17.
[38] Matthew Luckiesh, *Light and Colour in Advertising and Merchandising* (New York: D. Van Nostrand, 1923), cited in Birren, 'Color in the Plant', p. 11.
[39] Birren, 'Color and You', p. 17.
[40] Birren, 'Color in the Plant', p. 16.
[41] Heine, 'Color Sells Itself', p. 4.
[42] *The Enjoyment and Use of Color* (New York: Scribner, 1924); Birren, *Monument to Color* (New York: McFarland, 1938), pp. 34–35.
[43] Hahn and Miller-Zarnecke, p. 286.

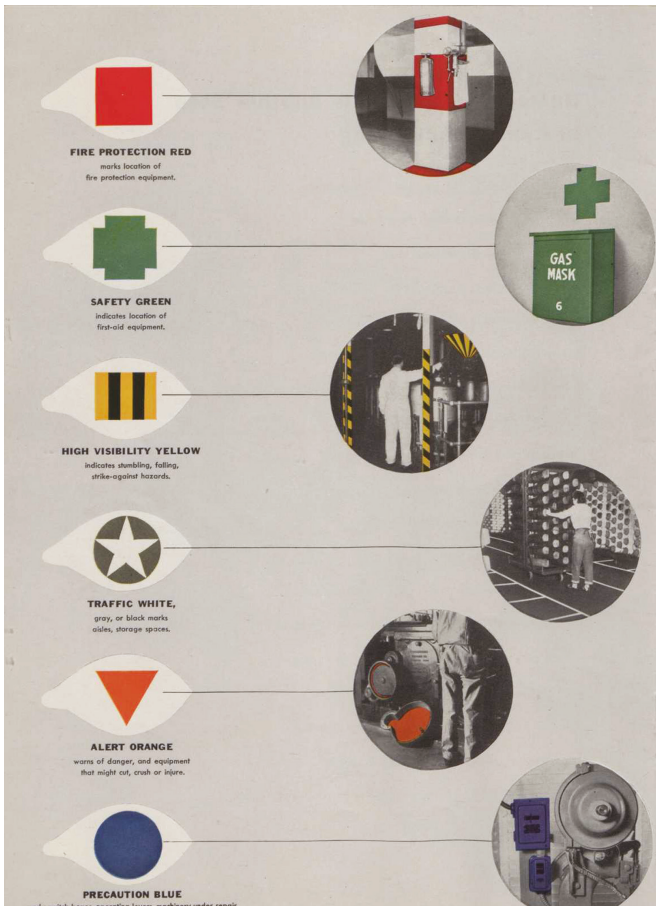

Fig. 2: *Functional Color Design for Safety and Productivity* (Hagley Library, 1946 Pamphlet)

everywhere among people and applied to the things they need and the things that answer their human wants. It is vital art which people eagerly accept and which is mighty good for them and for society.'[44]

In his lecture to the Disney artists, Birren pointed out the role of colour preferences in consumer attention and retail, describing research by 'a manufacturer of toilet articles', that 'found that people like red and blue; next is purple, then green, with orange and yellow last'.[45] Birren's observations around colour preferences drew upon certain chromophobic and gendered cultural assumptions, asserting that 'The negro ranks red and blue highest', along with

[44] Birren, *Monument*, p. 50.
[45] Hahn and Miller-Zarnecke, pp. 289–90. Although Birren doesn't state who the manufacturer is, I believe it's likely to be DuPont, given his prior relationship with the company. As the manufacturer's research revealed that '75% of all toilet articles were given away as presents', Birren stressed that colour design of these products must account for this fact.

'children, Indians and primitive peoples', and 'Even in insane asylums the greatest response will be to red and blue — they are the two big thrills'.[46] Yet irregardless of what people claimed ('what people say they like isn't always the thing they will respond to'), Birren argued that, 'In most everything we studied so far there is a consistent reminder that it is the simple things that people respond to — red, blue and green'.[47] Birren's approach to colour understood it as sensation, but one that could be scientifically studied: in *Monument to Color*, he said, 'Argue all you want that color is emotional and therefore beyond rule and law — the fact remains that even emotion can be sensibly analysed.'[48] Concluding his address to the Disney animators, Birren emphasized that the important thing was to think in terms of the mass: 'you're not concerned with "functional" colour schemes', but with 'the mass of people with the absolute type of color preferences' and elsewhere noted that 'it is always the mass reaction that counts'.[49] After a lengthy discussion of the history of colour symbolism, he emphasized 'really, when it comes to color preferences your guess is as good as mine. I have tried to play with color freely [...] hoping that out of this will grow an attitude on your part that will make you think of all people, of audiences rather than individuals'.[50] Insisting that as artists they were critical shapers of colour preferences, 'I think it is your problem not to ask people what they like, but to *know* what they like'.[51]

Birren's philosophies of colour shaped the industrial palette through his functional colour design for DuPont finishes, textiles, paints and plastics divisions while his focus on blue, red, and green and contrasting colour schemes in his lectures for the Disney company emphasized mass appeal in colour preferences. Like his work in industrial colour design as the *automatization* of the attention and energy of the worker by minimizing eyestrain and directing visual attention, Birren's approach to the cultural aesthetics of colour return repeatedly to a focus on mass preferences, whereby the artist's role should be to mediate these mass preferences. In this focus on the mass, the colour consultants, or colour 'engineers' as they were called, exemplify the mid-century design principles of the corporations for whom they worked, in which colour could be scientifically measured, understood and reverse engineered.

Animated colour was a material product of corporate modernity. From the industrial research of corporate laboratories that produced new synthetic pigments and plastics, to the new aesthetic philosophies of colour consultants, the professional ties between Disney and DuPont reveal a colour revolution that was manufactured, designed and consumed to order: in the words of Faber Birren, 'Color is a modern art, built upon modern progress.'[52]

[46] Ivi, p. 289.
[47] Ivi, p 291–92.
[48] Birren, *Monument*, pp. 11, 27.
[49] Hahn and Miller-Zarnecke, pp. 289, 291.
[50] Ivi, p. 293.
[51] Ibid.
[52] Birren, *Monument*, p. 27.

Biopolitics of Colour in Mid-Century Italian Visual Culture: *Red Desert* and the 'New Techniques of Life'

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Abstract

Since the early twentieth century, colour has been used for the purposes of improving health, well-being and safety, optimising productivity, reducing accidents, and minimising fatigue and stress. In the context of these interests, it became highly important to systematically study the reactions that colour could have on a standard subject, in order to manage and regulate the space and time of the experience, from work to leisure, education to treatment. These chromo-technics of regulation can now be studied based on one of the possible meanings of the concept of 'biopolitics' as proposed by Michel Foucault. The essay focuses on Italy and particularly the period between 1957 and 1964, when several initiatives dedicated to colour were implemented. These were years of strong national economic growth and increased life expectancy, giving rise to a growing wave of 'chromophilia'. I aim to highlight several points of convergence between the dissemination of chromo-technics and *Red Desert* (*Il deserto rosso*, Michelangelo Antononi, 1964) in order to demonstrate how the film develops a subtle consideration of colour biopolitics at the centre of contemporary visual culture.

Colour as a Biopolitical Medium

During what Regina Blaszczyk described as the colour revolution,[1] colour gained increasing attention for its practical applications in the modernist project of turning art into life, aesthetics into expertise. Utilising colour and its psychological impact, it became possible to consider and plan new shared spaces and new forms of collective life. Since the early twentieth century, new standards, operations and procedures were developed on an experimental, empirical or statistical basis to organise and rationalise individuals' perceptions through a functional use of colour. These techniques of regulation can now be studied based on one of the possible meanings of the concept of 'biopolitics' as

[1] Regina Lee Blaszczyk, *The Color Revolution* (Cambridge, MA: MIT Press, 2012).

proposed by Michel Foucault. As illustrated by the French philosopher, in mass society, governmentality sciences increasingly transcend the political sphere and move into the realm of biopolitics, dealing with issues relating to the regulation of the subjects' lives and bodies.[2] The premise of biopolitical governmentality is not necessarily linked to a state mechanism, rather it is apparent 'at every level of the social body and utilized by very diverse institutions', with the specific aim of 'the investment of the body, its valorization, and the distributive management of its forces'.[3]

In this regard, colour can be regarded as a medium of biopolitical intervention since, thanks to its psychophysiological powers, it has been able to contribute in various forms to the rationalisation plans carried out by capitalist societies during the twentieth century. On multiple occasions, colour has been used for biopolitical goals, with the aim of improving health, well-being and safety, optimising productivity, reducing accidents, and minimising fatigue and stress. The biopolitics of colour have operated on different — yet interlinked — levels, with the aim of defining standards and applying specific operations and procedures. Setting standards to be used by professionals is one of the objectives of scientific colorimetry, which takes on the task of codifying, based on fixed rules, a potentially unstable and elusive experience such as that of colour. Retracing the subjective dimension of colour back to psychological and statistical regularities became one of the great epistemological questions on the subject of colour during the twentieth century. In this regard, the introduction of the concept of the 'standard observer' by the International Commission on Illumination, within the visible colour classification system known as the chromaticity diagram (1931), appears rather symptomatic. As emphasised by Thomas Lemke, establishing a standard subject is a fundamental premise in a specifically biopolitical perspective:

> The objects of biopolitics are not singular human beings but their biological features measured and aggregated on the level of populations. This procedure makes it possible to define norms, establish standards, and determine average values. As a result, 'life' has become an independent, objective, and measurable factor, as well as a collective reality that can be epistemologically and practically separated from concrete living beings and the singularity of individual experience.[4]

By studying these regularities, colour began to be used increasingly as a tool

[2] Michel Foucault, *Security, Territory, Population: Lectures at the Collège de France, 1977–78*, ed. by Michel Senellart, general editors François Ewald and Alessandro Fontana (New York: Palgrave Macmillan, 2007); Michel Foucault, *The Birth of Biopolitics: Lectures at the Collège de France, 1978–79*, ed. by Michel Senellart, general editors François Ewald and Alessandro Fontana (New York: Palgrave Macmillan, 2008).
[3] Michel Foucault, *The History of Sexuality: An Introduction* (New York: Pantheon Books, 1978), p. 141.
[4] Thomas Lemke, *Biopolitics: An Advanced Introduction* (New York: New York University Press, 2010), p. 5.

for designing public and private spaces based on pre-determined psychological and bodily reactions. As previously set out by Goethe in his *Theory of Colors*, this potential of colour took on a more evident role in the 1910s and 1920s, in what Anson Rabinbach called 'the era of psychotechnics'.[5] Standing behind a functionalist and productivist ideal, a series of techniques to manage and regulate body energy attempted to rationalise the body's activities 'by reducing each task to a series of abstract and mathematically precise movements'.[6] In the context of these interests, it became very important to study systematically the reactions that colour could have on a standard subject, in order to manage and regulate the space and time of the experience, from work to leisure time, education to treatment. This biopolitical interest tied in with an area of research where various forms of technical and scientific discourse were integrated into various areas of expertise, such as the organization of work, advertising, architecture and interior design.[7]

During the post-World War II era, the same premise was the focus of a new wave of interest embodied in studies such as those conducted by Faber Birren in the United States and Maurice Déribéré in France.[8] It was during this period — which Eric Hobsbawm described as the golden age of capitalism — that colour increasingly became the focus of numerous projects, techniques and methods aiming to rationalise and conceptualise individuals and their experiences.[9] Colour is placed at the centre of a constellation of experiences which, in turn, is part of a technological and cultural context undergoing massive change, where it is necessary to consider the mutual correlation of three phenomena that took shape between the 1950s and the 1960s: a) the transition from black and white to colour in the mainstream media, facilitated by the introduction of new, faster and cheaper technologies in film, photography, television and print; b) the growing interest for colour in the field of industrial design, giving rise to the production of an increasingly large number of consumer objects available in a variety of colours; and c) the design of spaces devoted to work and leisure based on functionalist aesthetic criteria, aimed at minimising physical and mental effort and maximising comfort and consumption. In the post-war era, colour became a key subject not only for major filmmakers, photographers and visual artists, but

[5] Anson Rabinbach, *The Human Motor: Energy, Fatigue, and the Origins of Modernity* (New York: Basic Books, 1990), pp. 278–80.
[6] Rabinbach, *The Eclipse of the Utopias of Labor* (New York: Fordham University Press, 2018), p. 166.
[7] On the subject of science of work in relation to the topic of governmentality, see also Jacques Donzelot, 'Pleasure in Work', in *The Foucault Effect: Studies in Governmentality*, ed. by Graham Burchell, Colin Gordon, and Peter Miller (Chicago: University of Chicago Press, 1991), pp. 251–80.
[8] See, amongst others, Faber Birren, *Functional Color* (New York: The Crimson Press, 1937), and Maurice Déribéré, *La Couleur dans les activités humaines* (Paris: Dunod, 1955).
[9] Eric J. Hobsbawm, *The Age of Extremes: A History of the World, 1914–1991* (New York: Pantheon Books, 1994), pp. 257–86.

also for specialists from industry, commerce, advertising, design and many other areas.

This premise encompasses several countries in the West, creating a transnational network of techniques, practices and discourses that are still largely worthy of study. For the specific purposes of this essay, I will focus on Italy and particularly the period between 1957 and 1964, when several initiatives dedicated to colour were implemented. These were years of strong national economic growth and increased life expectancy, giving rise to a growing wave of 'chromophilia'. Lastly, I will concentrate on an analysis of *Red Desert* (*Il deserto rosso*, Michelangelo Antonioni, 1964) to demonstrate how the film develops a subtle consideration of colour biopolitics at the centre of contemporary visual culture. The phenomenon under examination is all the more interesting where it coincides with the years of expanding consumerism and modernization in Italy (the so-called Italian economic miracle), and with the years that define the shift from black and white to colour in the leading Western film industries.[10] With this approach, I aim to offer a new perception of the transition to colour in film as part of a broader renovation that permeates the visual and material culture of the 1950s and 1960s. A culture made up of a complex set of media, technology, forms of knowledge, discourse and modes of social organisation.

Chromo-Technics in Post-war Italian Visual Culture

'Colour [...] is not only an aesthetic element to be used indiscriminately, but is primarily an energy that affects a large part of our physical and mental well-being, with implications on social issues, productivity and safety.'[11] These words, appearing in 1959 in the second issue of the specialized periodical *Colore: Estetica e logica*, paved the way for a biopolitical project which was to be carried out by the upcoming Centro Italiano di Studi per l'applicazione del colore (Italian Centre for the Study of the Application of Colour). Inspired by the Centre d'information de la Couleur founded in 1951 in Paris by Maurice Déribéré and the physiologist Yves le Grand, the equivalent Italian centre, directed by the artist Mario Ballocco, aimed to gather documentation on international experiences to promote its own experimental studies and research, to serve as a networking and dissemination body, and lastly to offer advice to public and private bodies. Its objectives were ambitious, although its actual impact would be rather limited. The establishment of this centre — the history of which is yet to be reconstructed — is symptomatic of an interest in colour which manifests itself through a coordinated series of activities during those years.

[10] Richard Misek, *Chromatic Cinema: A History of Screen Color* (Malden, MA: Wiley-Blackwell, 2010), pp. 41–64.
[11] 'Il Centro Italiano di Studi per l'applicazione del colore', *Colore: Estetica e logica*, 2.2 (1959), 10 (my translation).

Between 1957 and 1960, the four editions of Italy's national colour convention were held in Padua, where scientists, engineers, architects, planners, designers and specialists from various fields came together to discuss the features and uses of colour in the spaces and practices of social life. Leading to a series of publications, the issues addressed included colour in the human environment, colour and safety, colour in schools and, lastly, colour in advertising, printing, packaging and commercial settings.[12] This was not the only important initiative dedicated to colour; in 1958, the Museo Nazionale della Scienza e della Tecnica in Milan hosted a Colour Exhibition, held by Mario Ballocco in collaboration with designers Enzo Mari and Bruno Munari.[13] The exhibition featured sections devoted to physical optics, physiology, psychology, chemistry and technology. The exhibition was held in a large L-shaped room with fifty stands, the first of which illustrated the physical, perceptive and chemical aspects of colour, while the following ones were dedicated to examples and applications in practical settings (homes, workplaces, hospitals and healthcare institutions, schools, industries). Other stands also exhibited samples of the colouring materials produced by the participating companies, including the two main national producers of paints and varnishes, Colorificio Italiano Max Meyer and Duco-Montecatini.

In line with what was happening in the United States and France during these years, new magazines were appearing, devoted to the study of colour, while already existing magazines addressed a growing interest in issues relating to psychology and the functionality of colour. Particular attention should be paid to the above-mentioned magazine *Colore: Estetica e logica*, published between 1957 and 1964, which took a multidisciplinary approach to address a wide range of issues relating to the theory, physiology, psychology and psychotechnics of colour. The work incorporated most of the studies and research being conducted in Italy and abroad at the time. In addition to the interventions by the editor Mario Ballocco, the magazine included translations of texts by Faber Birren and other foreign scholars, as well as articles devoted to colour in interior design, furnishings, architecture, schools, places of work, shops, in the street, in fashion and all spheres of public and private life.

Since it is not possible to go back over all of the reflections and experiments mentioned in the context of these initiatives and publishing projects, I will limit myself to examples that demonstrate Italy's desire to experiment with the theories and techniques coming from abroad. I will focus particularly on the areas of medical, educational and industrial applications of colour. With regard to the former, some Italian architects — working closely with doctors — began to set

[12] *Atti ufficiali del 1° e 2° Congresso nazionale del colore: il colore nell'ambiente umano; colore e sicurezza* (Padua: Il messaggero di S. Antonio, 1959); *Atti del 3° Congresso nazionale del colore: il colore nella scuola* (Padua: Il messaggero di S. Antonio, 1960); *Atti del 4° Congresso nazionale del colore: il colore nella pubblicità, il colore nella stampa, il colore nella confezione, il colore nell'ambiente di vendita* (Padua: Il messaggero di S. Antonio, 1961).

[13] 'La prima Mostra del colore al Museo della scienza e della tecnica', *Colore: Estetica e logica*, 2.2 (1959), 10, 39.

up care centres using chromo-technical principles. The architect Daniele Calabi, speaking at the first national congress of colour, recalled that when designing the psychiatric clinic in Padua, two special rooms were set up for children affected by tetanus. The rooms were north-facing, with small windows and screens to ensure constant darkness; the walls, ceiling, doors and beds had been painted deep blue and violet. The designer reported how the doctors discovered that convulsing children calmed down when moved into these rooms.[14]

In the domain of education, this period saw the spread of a series of toys and tools used for sensorial education. Several Italian schools began to use the rods created by Belgian mathematician Georges Cuisenaire, which involved teaching mathematics with ten lengths of rulers, each in a different colour, corresponding to the numbers one to ten. In some technical institutes, games were introduced that utilised colour's ability to facilitate the learning of basic concepts. One example is the 'chemistry game', where colour was used to distinguish the various chemical compounds that can be obtained. The use of such tools was undoubtedly facilitated by the growing dissemination of coloured papers and boards, plastic blackboards, toys, musical instruments and similar objects sold for educational purposes.[15]

However, it was the industrial sector that was most influenced by international research on colour conditioning in terms of health and safety as well as occupational fatigue and workers' productivity.[16] After the national establishment of a new public safety law (DPR 547/1955), a special commission set up by the National Agency for the Prevention of Injuries collaborated between 1955 and 1956 with major Italian industries (such as Fiat, Montecatini, Edison, Sip, Finmeccanica and Pirelli) to establish a standard for security signage. The chosen colours were yellow-orange for danger, red for prohibitions and obligations, and green for other indications.[17] In the same years, many Italian industries (Pirelli, Snam, Marelli, Olivetti) started researching and experimenting on the functional use of colour in workshops, which were supposed to have 'a favourable influence on the workers' physical and mental factors and, in turn, considerable economic advantages'.[18]

In this area of industrial activity, a leading role was played by the Italian company Colorificio Italiano Max Meyer, which took part — to a greater or lesser extent — in almost all of the initiatives mentioned above. The same company also provided the paints used to decorate the rooms and scenes for the

[14] Daniele Calabi, 'Lo studio del colore negli edifici per l'assistenza', in *Atti ufficiali del 1° e 2° Congresso nazionale del colore*, pp. 167–79.
[15] Pia Albertazzi Bossi, 'Il colore nei sussidi didattici', in *Atti del 3° Congresso nazionale del colore*, pp. 127–35, 283–85.
[16] On the concept of 'color conditioning' and its applications in the United States, see Blaszczyk, pp. 215–40.
[17] Cesare Commini, 'Il colore per le segnalazioni di sicurezza', in *Atti ufficiali del 1° e 2° Congresso nazionale del colore*, pp. 369–82.
[18] 'La psicologia del colore nell'industria', *Colore: Estetica e logica*, 3.3 (1960), 40 (my translation).

production of the film *Red Desert*, as noted in the film credits. For several years, the paint factory opened a programme called 'Colour and Function'. This was directed by Andrea Cecchetti, who had the opportunity to explore topics relating to functional colours in the United States. In an article published in 1961 in a specialized magazine, he wrote: 'to avoid the distractions of unnecessary colour contrasts, the pipes are camouflaged in the same colour as the background surface on which they are applied or projected, using colour to identify the critical points with rings (entry and exit from the room, valves, shutters, diversions, etc.)'. [19] In the same article, Cecchetti specified that:

> All products to be used for functional colours [...] should be brushed and not shiny, to avoid any unnecessary visual strain. There are many clear examples from American literature in this regard, but in Italy too there were significant improvements in productivity and accident prevention, with the introduction of functional colours at the workplace.[20]

As part of the programme, the 'Energicolor' (fig. 1) method had just been launched, with a six-colour system to be used for pipes (blue, red, green, yellow, violet, brown) and the respective materials put into them (air, steam, water, gas, acids and gases, oils and various liquids), so that the workers could quickly recognise the function of each conduit without straining their eyes.

The role of companies producing dyes, paints and colourants should not be underestimated in these processes. In this same period, an increasing availability of colour in mass culture also relates to the material culture, thanks to the spread of new raw materials. In the wake of the American trend of do-it-yourself, also in Italy the sale of easy-to-use paint that could be applied by just about anyone was the basis of advertising campaigns encouraging consumers to repaint their homes, using psycho-technical principles in line with new and updated criteria of taste. An interesting example is Ducotone, a new paint produced by Montecatini, which was the subject of a press, cinema and television advertising campaign, highlighting both the hygienic qualities of the material (bacteria and mould resistant) as well as its ability to reinvent the perception of the domestic space. In colour shorts produced by Ferry Mayer, intended for cinema (*La primavera in casa*, *Invito al Ducotone*, Amleto Fattori, 1960), the speaker praises the psychological qualities of a spontaneously coloured space, stating that 'Ducotone colours relax, rejoice, comfort and rejuvenate', while the images at the same time show a series of domestic interiors with walls painted in different variants. The brand shows viewers a range of 32 different colours, accompanied by a table of colour arrangements to guide the consumer in choosing the most effective colour, to strike a balance between functionality and aesthetics.

[19] Andrea Cecchetti, 'Il colore nell'industria. La colorazione funzionale nell'industria', *Homo faber*, 11.104–5 (1960), 6779–80 (p. 6780, my translation).
[20] Ibid.

Fig. 1: Colorificio Italiano Max Meyer's Energicolor System. Advertisement from *Colore: Estetica e logica*, 2.2 (1959).

Whilst colour was used to support functionality based on efficiency, well-being and consumer culture, cinema also had to realign itself within this same project, exploring the functional and subjective capacity of colour, while at the same time, marking out its boundaries, contradictions and aporias. In this regard, colour films gave rise to new opportunity for reflection on the various ways of inhabiting a world that was changing its visible skin as colour took on new meanings and functions.

A Biopolitical Film: Red Desert

A film where the biopolitical dimension of colour is explicitly addressed is *Red Desert*. The film approaches colour as an aesthetic, anthropological and social problem, prompting the viewer to reflect on the ways in which it was reshaping the spheres of experience. Within this visual and material culture, *Red Desert*

sheds light on several aspects of mid-century colour, which have thus far not been sufficiently considered in the many analyses of the film.[21] Several writings, interviews and other evidence show that Antonioni was deeply interested in the considerations and studies on the psychology of colour and psychotechnics. These promoted what the director called the 'new techniques of life'[22] in an interview with Jean-Luc Godard published on *Cahiers du cinéma* (November 1964). *Red Desert* is full of clues which — in an almost surreptitious and hidden way — hint at a series of changes to how colour was being used and thought about in Western society.

Antonioni never chooses the path of direct reflection, but rather seems interested in understanding — through sometimes almost imperceptible allusions — the way colour was redesigning the spaces of public and private life, as well as the behaviours and psycho-physiological states of the people living in those spaces. These considerations are developed in the film through its emphasis on the psychological impact of colour and its functionality within the industrialised and consumer society. Through the pathological state of its protagonist Giuliana, the film reveals the complexity of the integration between these two levels. The film thrives on a constant tension between the way colours appear to have been designed in the diegetic world (often in accordance with the principles developed in the field of psychotechnics) and the reactions they provoke in Giuliana (and, less frequently, in other characters, such as her son Valerio and the engineer Corrado).

The film shows the viewer a milieu which appears to be designed to organise the sensory elements, while at the same time it highlights the aporias and contradictions that make this same milieu traumatic for the characters who inhabit it. Studies on the impact of colour cut across contemporary practices and media and also make it necessary to reconsider the aesthetic boundaries and potential of colour. Various moments in *Red Desert* feature spaces and environments where colours appear to be designed and distributed with a functional approach. The interiors of the factory are central to one of the opening scenes with Ugo, Corrado and Giuliana. The pipes and machinery reveal the presence of one of the canonical examples of the application of functional colour (fig. 2), as shown by Max Mayer's Energicolour programme and the other examples mentioned

[21] See, amongst others, Angela Dalle Vacche, *Cinema and Painting: How Art Is Used in Film* (London: Athlone, 1996), pp. 43–80; Peter Brunette, *The Films of Michelangelo Antonioni* (Cambridge: Cambridge University Press, 1998), pp. 90–108; Céline Scemama, *Antonioni. Le Désert figuré* (Paris: l'Harmattan, 1998); Sandro Bernardi, *Il paesaggio nel cinema italiano* (Venezia: Marsilio, 2002), pp. 180–88; Murray Pomerance, *Michelangelo Red Antonioni Blue: Eight Reflections on Cinema* (Berkeley: University of California Press, 2011), pp. 70–110; Luca Venzi, 'Colore', in *Lessico del cinema italiano. Forme di rappresentazione e forme di vita*, ed. by Roberto De Gaetano (Milan: Mimesis, 2014), pp. 199–202.

[22] Michelangelo Antonioni, 'The Night, the Eclipse, the Dawn', in *The Architecture of Vision: Writings and Interviews on Cinema*, ed. by Marga Cottino-Jones (New York: Marsilio Publishers, 1996), pp. 287–97 (p. 290).

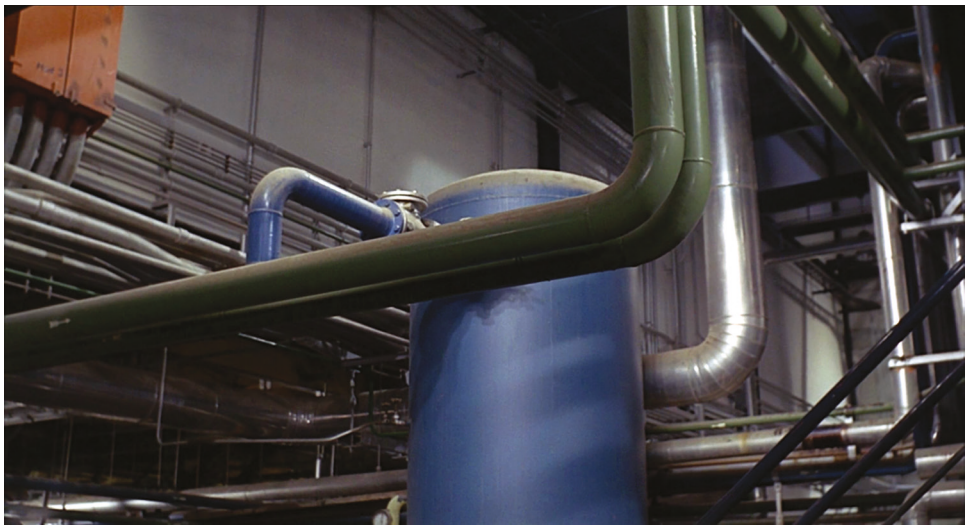

Fig. 2: *Red Desert* (*Il deserto rosso*, Michelangelo Antonioni, 1964).

above. Antonioni himself was interested in these subjects, of which he shows a clear awareness on several occasions:

> When, around the turn of the century, the world began to industrialize, factories were painted neutral colours — black or grey. Today, however, most of them are brightly painted. Even our water pipes, electricity cables, and heating systems are coloured. Behind this invasion of colour lie technical causes, but also psychological ones. The walls of the factories are coloured not red, but light green or pale blue — the so-called 'cool' colours, for workers to rest their eyes.[23]

From the beginning, the deep conflict between these functional colours and Giuliana's character becomes apparent. In the first sequence of the film, we see her wandering first with her son Valerio, then alone, and then with Ugo and Corrado, in and outside the factory grounds. All of the spaces she passes, from the bleak and grey industrial setting to the brightly coloured area with the machinery and pipes, are experienced as an assault on her body and senses. This creates a rift between the functional space and her experiential environment. Giuliana is quite clearly a pathological subject, a clinical case, who always over-, or under-reacts to her surrounding stimuli.[24] Particularly noteworthy in this regard is a statement by Antonioni's assistant

[23] Michelangelo Antonioni, 'Red Desert', in *The Architecture of Vision*, pp. 283–86 (p. 284).
[24] On this point, see Ruggero Eugeni, 'La modernità a disagio. Michelangelo Antonioni e la cultura psichiatrica italiana tra gli anni Cinquanta e gli anni Sessanta del Novecento', in *Michelangelo Antonioni. Prospettive, culture, politiche, spazi*, ed. by Alberto Boschi and Francesco Di Chiara (Milan: Il Castoro, 2015), pp. 49–68.

Carlo Di Carlo (included in the script published in 1964), which suggests that 'when establishing the protagonist's character, Antonioni acted as if she were constantly facing a colour test [...]; a method which facilitated the investigation into her personality using the most advanced techniques in psychological and psychiatric practices'.[25] For several decades, the literature on psychology and colour therapy drew attention to the particular reaction to colour of neurotic and psychotic patients: attention problems, impaired sensation, changes in body temperature, fatigue, hallucinations.[26] As stated in an article of the time, 'the influence of colour […] is much more pronounced in neurasthenic and psychopathic individuals'.[27] Giuliana — and, at times, Valerio and Corrado — show heightened reactions which seem to be evoked by colour or other sensations of vision, hearing, touch and taste.

The violence of the sensations experienced in the factory, in the sequence mentioned above, continues to influence the following scene in which Giuliana wakes up with a start in the middle of the night and looks for a thermometer to take her temperature. She then moves to her son's bedroom (where a mechanical robot, left turned on, keeps moving back and forth), before finally flopping over a chair on the landing. The three rooms the woman enters are designed according to the principle of taste distinctions (suggested by the elegant set and furnishings) converging with the principle of psychotechnical rationality (such as the wall leading to the bedroom, painted blue, a colour associated with rest). In this space, designed for comfort and well-being, Giuliana shows a similar physical discomfort to that shown in the unfamiliar factory environment. As noted by the director himself, there is a clear gap between her and her husband Ugo: 'Giuliana cannot adapt to the new "way" of life and goes through a crisis, while her husband is content with his lot in life.'[28] Whilst, in the previous sequence, the factory is experienced by Ugo as a very familiar space, almost an extension of his domestic environment, likewise, Giuliana sees her house as an extension of the factory, one of aggression on the senses, fatigue and confusion.

In terms of the sets and costumes, this first sequence in the apartment plays with a chromatic harmony created by a series of soft, relaxing colours: white, off-white, beige and browns, as well as the blue wall. The interplay of perspectives, camera movements and editing creates constant conflicts of lines, volumes and colours, deconstructing every idea of harmony and destroying the unity of the domestic sphere. In the frame where Giuliana comes out of her room, the blue railing is filmed as if it were a factory pipe, while the repetitive motion of the robot hints at the incessant machinery work of the technological world. In the other

[25] Carlo Di Carlo, 'Il colore dei sentimenti', *Il deserto rosso di Michelangelo Antonioni*, ed. by Carlo Di Carlo (Bologna: Cappelli, 1964), pp. 27–35 (p. 33, my translation).
[26] Faber Birren, *Color Psychology and Color Therapy: A Factual Study of the Influence of Color on Human Life* (New York: McGraw-Hill, 1950).
[27] 'Il colore è necessario al malato e al medico', *Colore: Estetica e logica*, 3.5 (1960), 41 (my translation).
[28] 'Red Desert', p. 284.

sequences set inside the home, protection and intimacy are constantly under threat from enormous passing vessels which can be seen from the long horizontal windows: what already seems like a home-factory also becomes somewhat of a home-port.

In this hybrid home environment, the child, Valerio, also suffers from a pathology that proves to be of a psychosomatic nature, when he seems not to be able to walk: a reaction due to an accumulation of stress caused by the overstimulation of the surrounding environment. His bedroom, it is worth remembering, is full of the sensory education tools mentioned in the pedagogical literature recalled above. To distract the child, and to dispel the fear gripping her, Giuliana — as can be read in the published script — 'takes a piece of chalk at random like a robot, and draws a circular purple shape, seemingly meaningless, vaguely resembling a spiral',[29] then traces a vertical sign with the yellow chalk. Whilst the complementary combination of purple and yellow seems to express the woman's unconscious need for unity and harmony, the shapes she draws reveal a state of anxiety, fear and vertigo. Having moved away from the blackboard, she approaches Valerio and gently caresses him; she begins to tell him the story of the girl on the island, encouraging him (and herself) to imagine a world where colours and sound seem to belong to an earlier stage of human evolution.

The pathologies uniting the mother and son (who are — not incidentally — the two characters with which the film opens and closes) appear to be due to an adaptive difficulty in an evolutionary process brought about by the accelerated pace of industrial society and its new biopolitical way of organising sensory elements. Giuliana and Valerio are like the birds mentioned by Giuliana at the end of the film, as she explains to her son that they have learned to avoid going through the yellow, poisonous smoke to preserve their existence. Similarly, the two characters must acknowledge a new way of approaching and organising colour within consumer and mass society where — unlike the imaginary world of the island — the artificial and the natural can no longer be truly distinguished from one another. It is this adaptive and evolutionary path that Giuliana strives towards throughout the film in an attempt to engage, as explained by her husband to Corrado using his familiar mechanical lexicon ('and the gears still don't quite mesh' ['e ancora non riesce a ingranare']). Yet, it is an exhausting journey: in the famous sequence with the barrow containing fruit painted grey, Giuliana says that she is 'always tired', before correcting herself, '... no ... not always ... sometimes', as if she herself somehow wanted to conceal her psychological and physical fatigue.

Whilst the diegetic environments are built according to the subjects who inhabit and interact with them in order to minimise fatigue and maximise comfort and productivity, Giuliana proves unable to have standard reactions within these environments. In this regard, the scene of the little red room inside

[29] Michelangelo Antonioni, Tonino Guerra, 'La sceneggiatura', in *Il deserto rosso di Michelangelo Antonioni*, pp. 85–145 (p. 134, my translation).

the shack is an extreme case. Red, stressed by psychology for its ability both to attract attention and arouse the senses, becomes the subject of one of the film's longest sequences. Antonioni himself stated that he would have never filmed the episode in a black-and-white film:

> For example, in the scene in the hut where they are talking about drugs and stimulants, I couldn't not use red. In black and white it would never have worked. The red puts the viewer into a state of mind that allows him to accept such dialogues. It's the right colour for the characters — who, in turn are justified by the colour — and also for the viewer.[30]

Whilst red serves as an element of intensification and excitation, as shown by the words and gestures of the characters; on the other hand, its prolonged presence overturns its function, transforming it into an element of fatigue. Between the first and second part of the long episode, an ellipsis suggests that all of the characters (except Giuliana and Corrado) fall asleep, having come down from the initial phase of excitement (suggestive games and erotic conversations).

In the sequence where Corrado outlines his plan to set up a business in Patagonia, at one point his attention begins to drift towards a few scratches on the wall of the shed, the green hills of the carboys, and the blue frame painted on the white wall. A series of camera movements — similar to the POV shots — demonstrate the power of colour to create a state of perceptual suspension, where attention is diverted away from a psycho-technical task (listening and responding to the workers' questions), losing itself in shapes and colours. The sequence takes on a strong reflective value, to the extent that the relationship between colour and attention was one of the key themes of psychotechnics, in line with the considerations made by physiology and psychology since the nineteenth century. In mass society, establishing a discipline on attention had become a key issue. The modern subject has been increasingly defined based on the ability to pay attention, that is to say, the ability to isolate a limited number of stimuli within a broader field of perception.[31] In the context of mobile and distracted perception, psychotechnical studies had often assessed the role of colour as a key factor of engaging attention. The relationship between colour and attention was now considered central to various fields, such as advertising, sales and safety in the workplace.

Another sequence that calls into question the psychotechnical research on colour of the time is the one set in the future shop (a very particular shop with no storefront, on an almost deserted street). As soon as she comes through the door, heading towards the opposite wall, Giuliana expresses to Corrado that she is undecided about which colours to choose to paint the interior walls: 'maybe

[30] 'The Night, the Eclipse, the Dawn', p. 295.
[31] On the subject of attention, see Jonathan Crary, *Suspensions of Perception: Attention, Spectacle, and Modern Culture* (Cambridge, MA: MIT Press, 1999).

light blue is better' ['forse è meglio celesti'] for the walls, 'and green for the ceiling' ['e il soffitto verde'], because 'they're cool colours that mustn't clash' ['sono colori freddi che non dovrebbero disturbare'], only to reveal she had not yet decided which products to sell. In the interview with Godard mentioned above, Antonioni remarks on the sequence:

> We had to choose between warm and cool tones. For her shop, Giuliana needs cool colours because they show off better the things she has to sell. Against a wall painted bright orange, the things would be drowned out, while against a pale blue or green the objects would stand out without being overwhelmed. I was interested in the contrast between cool and warm colours; there was orange, yellow, a brown ceiling — and Giuliana realizes that for her it is no good.[32]

Although this is a short passage in the film which does not appear to be of great importance, it is revealing. Indeed, Giuliana highlights her full awareness of living in a world that is increasingly organised around the principles of functional colour. The subject of colour in the retail environment was one of the most debated topics in the texts and events referred to above.[33] The female character is encouraged here to step into the shoes of an interior designer, to organise and design a way of regulating the sensorial experience of the future shop's potential customers.

In summary, through the pathological conditions of Giuliana, Valerio and Corrado respectively, the film reveals the conflict between a biopolitical concept of the subject, according to which the human being is regarded as the recipient of a series of 'techniques of life' and the concept that they themselves seek to embody, based on the singularity and irreducibility of the experience. Essentially, each of the three characters proves unable to carry out the psychotechnical tasks they are required to perform: choosing suitable colours for the sales area (Giuliana); learning through sensory education tools (Valerio); finding labour for his business project (Corrado). For them, what is at stake in achieving these tasks is a biopolitical action of treatment, rehabilitation and integration within society.

In this study on colour in mid-century Italian visual culture, I set out to highlight several points of convergence between the dissemination of chromo-technics and *Red Desert*, on the assumption that colour can be regarded as a biopolitical tool. At the end of this process, in which I have attempted to develop some interpretative and analytical hypotheses, two further clarifications are necessary. Firstly, although Italian chromo-technics regarded the whole of society as its field of intervention, its impact ultimately proved rather limited in time. Their greatest success sprang from the growing circulation of new materials, coloured objects and colour images and served to regulate their social

[32] 'The Night, the Eclipse, the Dawn', pp. 294–95.
[33] See Giorgio Paini, Andrea Cecchetti, 'Il colore nei punti di vendita', in *Atti del 3° Congresso nazionale del colore*, pp. 273–78; 'Il colore elemento di vendita', *Colore: Estetica e logica*, 3.3 (1960), 34–35.

dissemination during the period of the economic miracle and cinema's shift from black and white to colour. Already in the mid-1960s, the interest in colour could be seen in increasingly specialized areas, thereby losing the generalist dimension typical of the 'chromophilia' phase mentioned in this essay. The group of activities discussed here — primarily in the period between 1957 and 1964 — either disappeared or broke off into a large number of separate initiatives.

Secondly, it should be noted that my proposed method of analysis of a single film deserves to be tested on a larger body. However, by selecting a single case, I have highlighted the particular and paradigmatic nature of *Red Desert* as a biopolitical film. The choice of this film has allowed me to demonstrate its strong link to the visual and material culture of the time, beyond its artistic-cultural context. As such, I offer an alternative vision of the film by showing how it can be viewed from a bottom-up perspective, so to speak. Whilst the pictorial and artistic dimension is undoubtedly significant, it remains in itself insufficient to tease out the full richness of the film.

Colour Communications: László Moholy-Nagy, Walter Paepcke, and the Humanities Program of *Design Workshops*

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Abstract

This essay discusses the production, funding, and circulation of *Design Workshops* (1940–44), a group of 16mm Kodachrome films produced at László Moholy-Nagy's Chicago-based School of Design (formerly the New Bauhaus), to explore the role of colour theory and practice in the communicative agendas of Moholy and his corporate sponsor Walter Paepcke, chairman of the Container Corporation of America. As a symptomatic foray into the mid-century category of 'communication', the films collected as *Design Workshops* — at once documents of pedagogical theory and quasi-corporate promotional messages — involved moving images both in zones of pedagogical experimentation and in the more instrumental domains of public relations, packaging and brand management. In the case of Moholy-Nagy's School of Design, colour experimentation and creative making in the synthetic materials of the post-war — Saran or plywood — were wedded to the inculcation of forms of democratic subjectivity (perceptual skills, epistemologies, creative capacities) that the artist saw as essential to post-war citizenship at mid-century. The essay demonstrates Moholy-Nagy and Paepcke's overlapping investments in colour's functional, communicative dimensions at the School, and argues that colour film production in *Design Workshops* fuelled a vanguard humanities vision at mid-century. The essay reads *Design Workshops* as an allegory of that vision and its limits, performing the work and pedagogical theory of the School for potential donors and funding agencies like the Rockefeller Foundation.

In his mid-century treatise *Vision in Motion*, Bauhaus master, multimedia artist, and theorist of colour and light László Moholy-Nagy set forth a sweeping argument for what he called 'the new education', demanding interdisciplinary sensory training. Written largely in 1944 and published in 1947, the year following his early death from leukaemia, the treatise revised and expanded his previous works of media theory — chiefly *Painting, Photography, Film* (1925, revised in 1927) and *The New Vision: From Material to Architecture* (1932) — while framing them within an account of his research 'laboratory for a new education', the School of Design in Chicago. Founded as the New Bauhaus in

1937, the School sought to wed the practical needs of business and industry to the vanguard pedagogical ideals of the Bauhaus, which Moholy updated in *Vision in Motion* with an anxious eye to the post-war world.[1] 'The biological evolutionary progress of man', Moholy argued there, 'was possible only through the development and constructive use of all his senses, hands, and brain, through his creative ability and intuition to master his surroundings; through his perceptive power, conceptual thought, and articulated emotional life'.[2] Because Moholy understood humanity's inherent multisensory facility with media as the motor of its evolutionary progress, the new education would minister to primary human needs for media literacy, and intervene through 'the development of man's capacities', especially his 'ability to express himself in different media'.[3]

Vision in Motion's high-minded humanities ambitions at mid-century clarify the philosophical stakes of one contemporaneous product of Moholy's media pedagogy at the School: the group of 16mm Kodachrome films known today as *Design Workshops* (1942–44), which documented the School's far-flung activities during the war. The *Design Workshops* mark the realization, as well as stakes, of Moholy's longstanding desire for colour film production at the School and document a range of students' experimental work across media: from textiles, drawing, painting, and furniture design, to photography, photograms, camouflage, kinetic assemblages, and light modulators. Moholy shot and edited the films and travelled with them as he promoted the School across the US, from the corporate boardroom to the artist's branch of Chicago's local CIO union. 'Since we can't afford to advertise', he told his wife Sibyl, 'I have to be the advertisement'.[4] At an institution like the School of Design, then, colour film was a utopian medium, a way of training students for Chicago's flourishing non-theatrical film industry, and a pragmatic, rhetorically sophisticated PR tool.

Just as Moholy took advantage of the convenience and portability of Kodachrome slides for his lectures, so too the *Design Workshops* films function as a kind of mobile exhibition of the diverse products of the students' training at the School in media as well as various materials, from plywood chairs, to wooden springs, plastic jewellery, and novel synthetic materials of the post-war period. One of these — Saran — is introduced at the end of a series of shots of brightly-hued textiles from the weaving workshop. In this sequence, the textiles' haptic quality merges with their visual appeal, perhaps a gesture to a Bauhaus synesthetic ideal, and one impossible to communicate as fully without the rich chromatic saturation of Kodachrome. These entwined senses are addressed by the blocking of students like Juliet Kepes, daughter of School instructor György Kepes, shown handling variously coloured samples, turning them towards the

[1] László Moholy-Nagy, *Vision in Motion* (Chicago: Paul Theobald & Co., 1947), p. 63.
[2] Ivi, p. 20.
[3] Ivi, pp. 14, 20.
[4] Sibyl Moholy-Nagy, *Moholy-Nagy: Experiment in Totality* (Cambridge, MA: MIT Press, 1969), p. 213.

camera as an exhibitionary device; and we see a hand caress another bright red textile mounted for display on the wall. We then cut to a close-up of yet another student-made textile — this one a dense weave of purples, blues, yellows, and reds — superimposed with a title that reads: 'Plastic materials such as Saran from the Dow Chemical Company are tested either alone or in combination with other materials.' Display of student craftsmanship in weaving merges seamlessly with product placement, a deft bit of packaging not only for Dow's plastic, but also for a School keen to promote a humanities vision that insisted on the usefulness — for industry — of the students' capacities in various media with their integrated 'senses, hands, and brain'.

In sequences like this, where Kodachrome abets the synergistic cross-promotion of corporate sponsor and educational institution alike, Moholy's chromatic functionalism seems to have learned a lesson from the School's most reliable champion and benefactor, Walter Paepcke, the visionary chief executive of the Container Corporate of America (CCA), a Chicago-based paperboard firm. Like his corporate patron Paepcke, Moholy increasingly understood colour as having what I'll call a functional, *communicative* value within a larger administrative art of packaging that was practiced in a highly competitive media environment, which demanded all the chromatic resources of good design.[5] In this essay, I turn to the production, funding, and circulation of *Design Workshops* to explore more carefully the role of colour theory and practice in the intersecting communicative agendas of Moholy and Paepcke at the School of Design, which became the Institute of Design in 1944 amidst a significant curricular and administrative restructuring, with Paepcke as the chairman of its Board of Directors.[6] As a symptomatic foray into the expansive mid-century category of 'communication', the films collected as *Design Workshops* involved moving images both in zones of pedagogical experimentation and in the more instrumental domains of publicity, packaging, and brand management. In the case of Moholy-Nagy's School of Design, colour experimentation and creative making in the synthetic materials of the post-war — Saran and plywood — was wedded to the inculcation of forms of democratic subjectivity (perceptual skills, epistemologies, creative capacities) that the artist saw as essential to post-war citizenship at mid-century.

The opening of *Design Workshops* announces this emphatically, as we fade from the title 'Design Workshops', stencilled on a sheet of glossy plywood, to a bright-orange piece of paper, aflame, bearing a quotation from Moholy himself: 'The Bauhaus education is a new and powerful correlation of all creative processes.' This bold colour scheme (white typography on orange) shifts, in a cut

[5] As Neil Harris has demonstrated, packaging emerges as a 'whole culture' in the US in the 1920s and 1930s, an interdisciplinary juncture in a new professional culture of consumption. Neil Harris, *Art, Design, and the Modern Corporation* (New York: Smithsonian Institution, 1984), p. 17.

[6] Alain Findeli, 'Design Education and Industry: The Laborious Beginnings of the Institute of Design in Chicago in 1944', *Journal of Design History*, 4.2 (1991), 971–1113.

to a closer framing on the same sentence, to light blue on black, before a pulsing bar of orange light emerges to focus our attention by spotlighting the phrase 'creative processes'. These eye-catching shifts in colour are echoed as we cut to a shot of a Chicago city street at night, where a superimposed stoplight changes from red, to orange, to green, followed by a close-up of a green light reading 'GO'. Having quickly summarized his pedagogical philosophy, immersed us in a dynamic urban scene, and summoned a range of materials and media (plywood, typography, paper, coloured light, celluloid) essential to the School's ethos, Moholy cuts to an exhibition where the students' work at the School will now double the film's own chromatic exhibitionary labours. Colour, these films will show us, was an essential element of an ambitious program of post-war *Bildung* predicated equally on the design of forms and the design of subjects.

In doing so, Moholy joined bleeding-edge colour theory at the School of Design to the instrumental communicative paradigms around colour proper to the spheres of advertising, public relations, wartime mobilization, and post-war planning. As we'll see, this chromatic domain of what began to be called 'functional colour' in the 1930s was also essential to Walter Paepcke's contemporaneous managerial efforts to remake the corporate identity of the CCA as a modern packaging firm, one that marshalled the talents of a host of modern designers in Moholy's ambit. Without collapsing important philosophical differences between Moholy, the visionary Bauhaus master, and Paepcke, the canny paperboard executive, this essay demonstrates their overlapping investments in colour's functional, communicative dimensions at the School of Design, and argues that colour film production in *Design Workshops* fuelled a vanguard humanities vision at mid-century that depended on the humane art of packaging. *Design Workshops* functioned as a kind of allegory of that vision and its limits, performing the work of the School — its pedagogical philosophy and its very utility as an educational institution — for potential donors and funding agencies.

Tracking the circulation of *Design Workshops*, the essay builds upon recent scholarship on the role of filmmaking at both the Bauhaus and its American incarnation at the School of Design, which intersected with the broader terrain of Chicago's booming non-theatrical film industry.[7] By bringing Paepcke and Moholy together through their shared attention to colour's functional,

[7] See Findeli's overview of the vast literature on the New Bauhaus. On the relationship between the New Bauhaus and Paepcke's CCA, see James Sloan Allen, *The Romance of Commerce and Culture: Capitalism, Modernism, and the Chicago-Aspen Crusade for Cultural Reform* (Chicago: University of Chicago Press, 1983); and Lara N. Allison, *Perception and Pedagogy: Design, Advertising, and Education in Chicago, c. 1935–55* (PhD dissertation: Columbia University, 2009). On film and moving-image media at the New Bauhaus, see Elizabeth Siegel, 'Vision in Motion: Film and Photography at the Institute of Design', in *Taken by Design: Photographs from the Institute of Design, 1937–1971*, ed. by David Travis and Siegel (Chicago: Art Institute of Chicago in association with the University of Chicago Press, 2002), pp. 214–23; and Amy Beste, *"All Roads Lead to Chicago": Encyclopedia Britannica Films, the Institute of Design, and Nontheatrical Film* (PhD Dissertation: Northwestern University, 2012).

communicative value, I extend the work of recent film historians who have turned to industrial and so-called 'useful' cinema to trouble easy distinctions between avant-garde aesthetics and the domain of advertising.[8] In Moholy's case, colour filmmaking and colour practices at the School allowed him to continue in the US a range of aesthetic experiments in new colour technologies and processes begun in the course of his earlier work as an artist and commercial designer in Europe. Even as his theoretical writing on colour circa 1937 sought to divorce colour from its 'naturalistic-illusionist meaning', colour of a decidedly functional variety became part of what Elizabeth Siegel has dubbed the 'new tools of the modern artist' used during Moholy's Chicago period, skills that 'came to encompass all the components of administration'.[9] Just as Moholy's expanded administrative media practice now included course catalogues and syllabi, so too did it depend upon the communicative value of 16mm Kodachrome as a promotional device, fundraising strategy, and a craft-based articulation of a vanguard humanities agenda.[10]

As a work of PR, deftly packaging the School's animating interdisciplinary and intermedial ethos, Moholy's *Design Workshops* echoed Paepcke's own commitment to colour as a tool of corporate communication — a way of branding an organization's public identity through 'institutional advertising' in a competitive media environment.[11] This functional value of colour design applied equally to the organizational forms of corporations and of schools, as was also the case with the original Bauhaus. The School's persistent financial troubles and political pressures yielded an urgency about communicating the School's message to the world, and the use of bold colour in the new typography — what Moholy described 'communication in its most intense form' — played a key role in the range of marketing materials developed for 'the construction of the Bauhaus brand'.[12] As colour communications, *Design Workshops* were also caught up in broader arguments at mid-century about the very nature of the humanities and

[8] *Useful Cinema*, ed. by Charles R. Acland and Haidee Wasson (Durham: Duke University Press, 2011); Michael Cowan, 'Absolute Advertising: Walter Ruttmann and the Weimar Advertising Film', *Cinema Journal*, 52.4 (Summer 2013), 49–73.

[9] See Moholy-Nagy, 'Paths to the Unleashed Color Camera' (1937), reprinted in *Lázsló Moholy-Nagy: Color in Transparency: Photography Experiments in Color*, ed. by Jeannine Fiedler and Hattula Moholy-Nagy (Steidel: Bauhaus-Archiv, 2009), p. 38; Siegel, 'The Modern Artist's New Tools', in *Moholy-Nagy: Future Present*, ed. by Matthew S. Witkovsky and others (New Haven and London: Yale University Press, 2017), p. 232.

[10] On Kodachrome's (and before it, Kodacolor's) connections with moving image 'craft' practices and energetic amateur practices, see Kaveh Askari, '16mm Colour by a Career Amateur', *Film History*, 21.2 (2009), 150–63.

[11] Rather than directly selling a product or service, 'institutional advertising' seeks to imbue a product with a more intangible aura or a corporate personality. On the CCA's institutional advertising, see Allison.

[12] Catherine Ince, 'Spread the Word: Bauhaus Instruments of Communication', in *Bauhaus: Art as Life* (London: Koenig Books, in association with Barbican Art Gallery, 2012), p. 112. Ince includes Moholy's quotation from his essay 'The New Typography', reproduced in *Moholy-Nagy: An Anthology*, ed. by Richard Kostelanetz (New York: Da Capo, 1970), p. 75.

their role in so-called General Education initiatives, and the films circulated in a media environment in which the arts and humanities, to survive, were forced to justify themselves to private philanthropies, which meant competing for the attention of audiences and donors alike. In this sense, *Design Workshops* offer an important episode in what Mark Garrett Cooper and John Marx have recently analysed as the work of schools as 'media institutions' — the ways educational institutions have historically deployed media to address audiences and argue for their usefulness in a competitive marketplace that, in the early and mid-twentieth-century, co-evolved with the new managerial arts of 'packaging'.[13] As the intersecting labours of Paepcke and Moholy at the School of Design make clear, 'packaging' meant more than the point-of-sale design of any given commodity's container; it encompassed the new profession of public relations, practices of propaganda, and the broader conceptual matrix of 'communication' through which these arts were understood.

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Moholy's most sustained analysis of that matrix was *Vision in Motion*, but his earlier works of interwar media theory devoted considerable attention to the psychophysical aspects of colour, and thus informed the artist's desire to wed colour values and various forms of colour composition across media to his broader utopian agenda of sensory training and uplift. In this way, the multimedia theory and practice of colour at the Institute of Design, as promoted in *Vision in Motion* and enacted in *Design Workshops*, extended aspects of the chromatic commitments of the pedagogical program of the German Bauhaus. There, various theories of colour — ranging from the spiritual or Theosophical to the scientific and technical — were taught, as students conducted synaesthetic experiments in colour music, studied the theories of colour harmony of Wilhelm Ostwald, and were tasked with a range of colour exercises as tools of introspection.[14] At the core of this curriculum, was a turn to a 'nondiscursive, nonconceptual' form of knowing, a kinaesthetic epistemology that assumed, in the way of psychophysics, 'a relationship of correspondence between physical stimulus and psychological sensation'.[15] 'Forms and colors', Walter Gropius stated in 1923, 'gain their meaning in the world only through the relationship with our inner being'.[16] Similarly, Moholy's pedagogical aim to start with elementary forms and colours, and find their precise sensorial equivalents, underscored the foundationalism and elementarism at the heart of the Bauhaus's approach to colour. Elementary

[13] Mark Garrett Cooper and John Marx, *Media U: How the Need to Win Audiences Has Shaped Higher Education* (New York: Columbia University Press, 2018), p. 5.
[14] Sarah Street and Joshua Yumibe, *Chromatic Modernity: Color, Cinema, and Media in the 1920s* (New York: Columbia University Press, 2019), pp. 151–69.
[15] Zeynep Çelik Alexander, *Kinaesthetic Knowing: Aesthetics, Epistemology, Modern Design* (Chicago: University of Chicago Press, 2017), p. 174.
[16] Gropius, quoted in *Kinaesthetic Knowing*, p. 181.

forms and colours, as a means of returning students to 'ground experiences', were framed as a challenge to modernity's regime of specialization, and an essential part of a holistic education ministering to the 'whole man'.[17]

Similarly, colour experimentation and colour theory played an essential role in Moholy's pedagogical practice at the School of Design. While colour film production didn't begin in earnest at the School until 1942, theories of colour and practices of its technical manipulation — what Moholy called the 'high craft' of colour processes — were incorporated into various aspects of the curriculum from the start, and followed from Moholy's experiences with colour photography through his work as a commercial designer in Berlin in the late 1920s.[18] Moholy later took courses in new colour processes (including Kodachrome, Agfa, Dufay, and Finlay) in London in the 1930s, and he worked with them as Art Director for the Pallas design studio in Amsterdam, whose commercial printing arm included a range of colour experts. In 1937, the year of the New Bauhaus's founding, Moholy published 'Paths to the Unleashed Color Camera', a short essay evaluating contemporary colour technologies and practices through their capacity for non-naturalism, the sign of liberated chromatic creativity. In that same year, his colour photograph 'The Tinsel and the Glamour' appeared in *Fortune* magazine at the conclusion of an article titled 'Fifteen Paper Companies', the second of three profiling 'the lively paper industry' in the US (fig. 1).[19] Moholy's decidedly objective, functional photo, featuring an array of brightly hued paper products — confetti, tinsel, masks, table coverings, wrapping paper — works to illustrate paper's sheer communicative ability 'to mean a thousand things' today.[20] The artist, described as 'the Director of the New Bauhaus set up by the Chicago Associate of Arts and Industries in a mansion donated by Marshall Fields', is credited with 'looking at things as dispassionately as an astronomer looks at a universe'.[21] But the photograph has also subtly embedded a corporate advertisement — for Chicago-based United Airlines — into its festive scene in a way that acknowledges the new synergies between art and industry in the production of colour communications. And while Paepcke's CCA escapes mention in this article, one of the firm's own early exercises in corporate branding — French poster artist A. M. Cassandre's striking advertisement of the CCA's corporate 'integration' — appears following the conclusion of the paper article.

Paepcke's own tastes and significant financial investments in modern design mark a commitment to the role of colour within a broader strategy of corporate communications in the CCA's corporate identity program. Beginning in the

[17] *Kinaesthetic Knowing*, p. 183.
[18] Moholy's 1933 letter to Sibylle Pietzsch, quoted in Fiedler, 'Moholy-Nagy's Color Camera Works: A Pioneer of Color Photography', in *Color in Transparency*, p. 20.
[19] 'Fifteen Paper Companies', *Fortune*, November 1937, p. 132.
[20] Ivi, p. 138.
[21] Ibid.

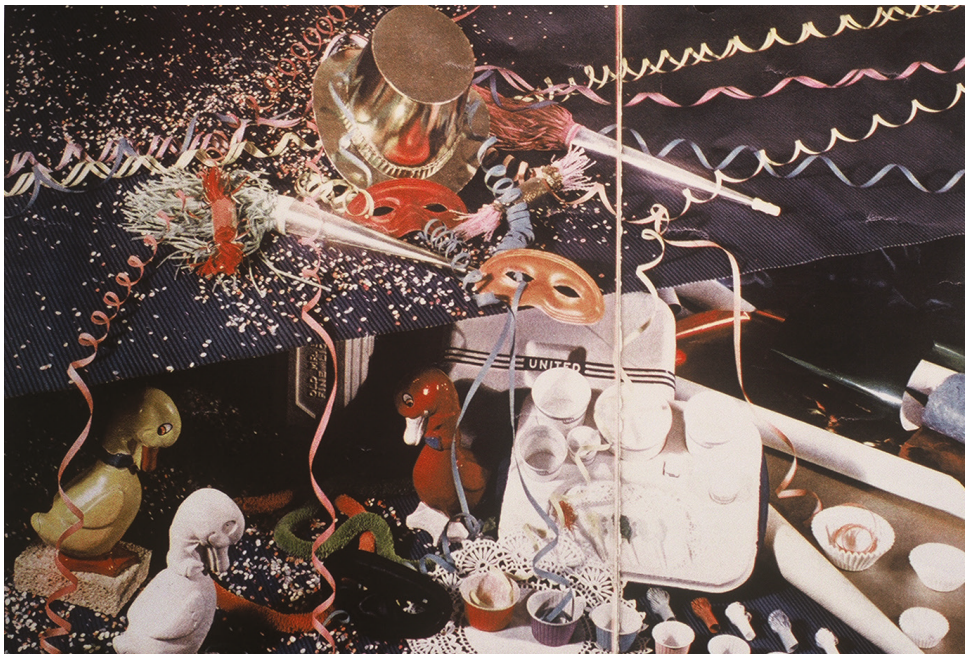

Fig 1. Moholy Nagy, *The Tinsel and the Glamour*, in 'Five Paper Companies', *Fortune*, © 1937 Estate of László Moholy-Nagy / Artists Rights Society (ARS), New York.

mid-1930s, Paepcke's CCA championed modern 'good design' as an important 'function of management', and a means of providing firms with a distinctive graphic identity. In 1936, Paepcke hired Egbert Jacobson, a leader in colour theory and typography, as Director of the Department of Design, where he oversaw a sweeping refashioning of the CCA's corporate image, from logos, invoices, and annual reports, to office interiors, factories, and trucks. 'The painting of work rooms', Jacobson explained in an overview of his work at the CCA, 'has brought the best experience of lighting engineers and colour consultants into the everyday life of workers', while reducing 'tension for executives' and adding to 'the efficiency of secretarial staffs'.[22] Essential to this public relations project was Jacobson's *Color Harmony Manual* (1942), based on the Ostwald system and published and sold by the CCA's Color Standards Department to 'assist in communication' between art directors, advertisers, managers, and designers by developing a standard descriptive language for colour.[23]

[22] Egbert Jacobson, 'Good Design: An Important Function of Management', *Graphis*, 6.30 (February 1950), 136–47, 199–204, 140, 201.
[23] For more on the CCA's horizontally model of integrated corporate knowledge production, see Allison; and Phillip B. Meggs, 'The Rise and Fall of Design at a Great Corporation', in *Graphic*

Spearheaded by Jacobson, Paepcke's design efforts at CCA were shaped by the rising prestige of so-called 'functional color' and the increasingly sophisticated theories of colour engineers and consultants to bring colour at mid-century into the soft behaviourist domains of scientific management and mood conditioning. Faber Birren, who coined the phrase 'functional color' in a book published in the same year as the New Bauhaus's founding, rose to prominence in Chicago in the mid-1930s through the colour program of a wholesale meat manufacturer.[24] For Birren, the term was meant to 'do some straight thinking' about an often unscientific and irrational topic by describing colour's pervasive utility: identifying and classifying objects (and hazards), increasing domestic efficiency, improving the safety of factories and plants, increasing legibility of communications, reducing eye-strain in the experience of architecture and home décor, protecting against heat, and cooperating 'with illumination to add efficiency to labor'.[25] And as Paepcke's CCA was increasingly aware, for 'the manufacturer of packaged goods' functional colour role in producing legibility and visibility in advertising 'builds up permanent identity for the thing he sells'.[26]

If Birren's work, according to fellow corporate colourist Egmont Arens, 'carried on where Ostwald stopped', a similar claim might be made of Moholy and Paepcke's Chicago-based Bauhaus reboot.[27] Like Birren and other functional colourists, Moholy and Paepcke understood colour theory and practice as a form of what their contemporaries dubbed 'Visual Public Relations', colour in the service of morale-building, mood-conditioning, and identity-building, from the colourization of factories or war plants to the boardroom and the classroom.[28] Colour's role in practices of holistic 'integration' was the hallmark of Moholy's design pedagogy at the School of Design. Moholy's reworking of Walter Gropius's famous bulls-eye diagram for the Bauhaus curriculum in Chicago, which rebooted its famous preliminary course (*Vorkurs*) as the transdisciplinary core required of all first-year students, located the study of the medium of film and photography in a 'Light Workshop', one of six specialized workshops to follow the propaedeutic *Vorkurs*.[29] Colour was placed in another specialized workshop, alongside 'painting' and 'decorating'. For the fall semester of 1938, Moholy had planned to appoint French painter Jean Hélion as head of the Color Workshop, and designer Herbert Bayer head of the Light Workshop, before the

Design History, ed. by Steven Heller and Georgette Ballance (New York: Allworth Press, 2001), pp. 283–92. With Paepcke's support, Jacobson also published a further elaboration of Wilhelm Ostwald, *Basic Color: An Interpretation of the Ostwald System* (Chicago: Paul Theobald, 1948), which was designed by two of Moholy's students at the ID, Morton and Millie Goldsholl.

[24] Birren's blue-green showroom walls and complementary lighting made the manufacturer's steaks look redder, and improved sales.

[25] Faber Birren, *Functional Color* (New York: The Crimson Press, 1937), pp. 11, 12.

[26] Ivi, p. 12.

[27] Regina Lee Blaszczyk, *The Color Revolution* (Cambridge, MA: MIT Press, 2012), p. 220.

[28] Ivi, pp. 232–37.

[29] 'School of Design catalogue, 1938–39', Box 3, Folder 54, Institute of Design Collection, University of Illinois at Chicago Library, Special Collections. Hereafter UICIDC.

New Bauhaus was abruptly closed when it lost the support of its sponsor, the Chicago Association of Arts and Industries.[30]

But this practice-based separation of colour (in painting, murals, or decorating) and light (in photography, film, or typography) was never hard and fast, given the Bauhäuslers attentiveness to the intertwined physical and physiological properties of each, and the School's pedagogical aim of synthesis and intellectual integration. A description of the various exercises from the Light Workshop of 1937 included a 'Color Filter Study' working with both 'ordinary "color-blind" emulsions' and 'with some of the colour-sensitive materials such as orthochromatic and panchromatic films'.[31] In the first-year curriculum, exercises in photography, the building of light modulators, and drawing and colour, exposed students to materials and their properties, while what the catalogue calls the 're-examination of color' would provide still further colour training. Here, students would isolate colour's physical and psychological properties, and learn its 'receding and advancing values'.[32] This early exposure to colour was cast as a 'reliable background' for the students' 'later specialized work in any type of visual expression: rendering and packaging, poster and advertising, mural and easel painting, wallpaper and decorating'.[33] When the New Bauhaus reopened as the School of Design in 1939, with Hungarian designer György Kepes appointed as the head of Light Workshop, colour and light would again be taught together, and across media practices. A course description of Kepes's Light Workshop begins by explaining the centrality of colour processes and technologies for all photography students: 'Just as traditional painting involved colour techniques from frescoes to oil, so the pioneers in photography are giving us the photogram, photomontage, the photomural, microscopic, macroscopic, high-speed and colour photography, and new motion picture techniques.'[34] Thus does 'the expert in photography becomes the expert in light and extends the scope of his talents to include stage, exposition, advertising, and other lighting problems'.[35] In *Design Workshops*, Kepes himself appears in the thick of one such problem. He's seen wrapping a fashion model in thin silver wire. Coloured gels bathe her in hues of blue and red, and thrown light gleams on the coiled wire as she stands in front of another of the School's vanguard models — a plywood chair. The chair's bright red, removable upholstery is another novel object, its textile woven, in part, of Saran (fig. 2). The curricular saturation of colour experimentation into the work of Kepes's Light Workshop was consistent with Bauhaus aesthetic principles, and Moholy's own philosophies. But it is also telling that, in Chicago, circa 1937, the Light Workshop also included the sphere of 'publicity', a use for

[30] 'Exhibition on the New Bauhaus, 1937–38', Box 3, Folder 56, UICIDC.
[31] Ivi.
[32] 'School of Design Catalogue, 1942', Box 3, Folder 63, UICIDC.
[33] Ivi.
[34] 'School of Design, Light Workshop, Photography, Day and Evening Classes', School of Design: Course and Program Descriptions, 1938–44, Box 3, Folder 64, UICIDC.
[35] Ivi.

Fig. 2. György Kepes wrapping a model in wire coil for the Light Workshop. © 1942-43 Estate of László Moholy-Nagy / Artists Rights Society (ARS), New York.

colour perhaps best exemplified by the *Design Workshops* films themselves as communications — that is, as publicly facing media extensions of the School's urgent humanities mission, now framed to meet the demands of a nation at war at a moment of communicative urgency. Travelling widely, the films represented the social utility of colour experimentation across media at the School; they expressed the creative activities, democratic capacities, and social orientation of certain kinds of 'useful' pedagogical subjects, as trained at the School in cutting-edge colour technologies during the war, and their very rhetorical success at securing funding for the School depended on the extent to which the films might be considered as an expression of a vision of the humanities themselves.

In other words, the films were designed to communicate not just to the School's potential corporate sponsors, showing the utility of new industrial products like Saran, but to officers at the Rockefeller Foundation, the private philanthropy that had supported their production in the first place, with a small grant ($7,500) for film production in 1942, and with the support of Paepcke.[36] Buoyed by these

[36] Walter P. Paepcke Papers, Box 61, Folder 1, Special Collections Research Center, University of Chicago Library. Hereafter WPP.

funds, Moholy announced the School's capacity 'to continue the avant-garde work which has been so essential in making the film a prominent part in the search for contemporary expression, the more so as commercial production is still governed by conceptions derived from the traditional pictorial art, and has not yet the control of its potentialities'.[37] The most essential public product of the grant was not the avant-garde Kodachrome work *Do Not Disturb* (1945), an abstract meditation on desire, jealousy, and betrayal, produced by Moholy and various ID students, but *Design Workshops*. In these films, 'contemporary expression' didn't mean abstract form, but rather a set of humane expressive capacities cultivated at the School across various media forms and processes, and cast in *Vision in Motion* as essential to democratic subjectivity. The colour films' communicative work becomes clear only within the interpretive horizon through which their content was understood — for RF officers — as a vanguard expression of the mid-century humanities, and a particularly 'functional' humanities at that.

Here, we should recall the central role of the Rockefeller Foundation in the emergence of the mid-century 'communications complex'.[38] In the prelude to the war, the Humanities Division of the foundation, led by its Assistant Director John Marshall, sponsored the so-called 'Communications Group'. An important collaboration among the academy, the state, and private foundations, the Communications Group explored the problems of 'mass influence', the dynamics of fascist propaganda, and the possibility of 'genuinely democratic propaganda'.[39] Intersecting with these efforts, beginning in 1935, the Humanities Division of the Foundation, along with its Foundation-funded General Education Board, devoted considerable funds to various initiatives that explored the possibilities of film and radio for general education initiatives.[40] The Foundation hoped that programs of quality 'visual education' would elevate the public taste and serve in the production of democratic subjects, consistent with the Foundation's liberalism.

Moholy's curricular aims for colour film production at the School thus became entwined with a broader interest in funding educational film as part of a humanities mission at a moment of intense interest in the power of film and other mass media to build morale, to propagandize, and to shape public opinion, a topic Moholy took up directly in the 'propaganda machine' section of *Vision in Motion*.[41] There, he indicted 'unofficial education' — advertising, the press, and radio — for fomenting an atmosphere of ideological mystification. For Moholy,

[37] 'School of Design, Light Workshop, Photography, Day and Evening Classes', School of Design: Course and Program Descriptions, 1938–44, Box 3, Folder 64, UICIDC.
[38] See Cooper and Marx, *Media U*.
[39] Brett Gary, *The Nervous Liberals: Propaganda Anxieties from World War I to the Cold War* (New York: Columbia University Press, 1999), pp. 85–130.
[40] William J. Buxton, 'Rockefeller Support for Projects on the Use of Motion Pictures for Educational and Public Purposes, 1935–1954', *Rockefeller Archive Center Research Report* (2001), 1–8.
[41] *Vision in Motion*, pp. 19–20.

unofficial education produces a media environment 'of a thousand details, but missing all fundamental relationships'. *Vision in Motion* sought to defend the role of the techno-savvy humanities themselves in redressing the ideological and biological impairments inflicted by corporate mass media and the seeming saturation of market values over democratic values. The Light Workshop that housed the film and media program at the Institute of Design was framed within this broader regime of sensory and medial therapy, providing students with the 'tools of integration'.

Democratic rehabilitation and integration were also an urgent response to the conditions of a nation at war, which demanded the same kind of flexible, interdisciplinary, and intermedial creative capacities the School had always taught, and total mobilization thus spawned a number of pragmatic design projects for students. As they navigated wartime metal shortages, students prototyped plywood springs; they designed parachute clothes and new kinds of barbed wire, and experimented with shock-proof helmets and portable runways for temporary airfields. During the war, the School's curriculum was also tweaked, and new courses were developed: an art-historical survey was reframed as 'The Social Usefulness of Art and its Relationship to a Nation of War'; and the School offered a 'Visual Propaganda in Wartime' course in collaboration with the Army, where graphic design abetted public education about air-raid procedures and wartime information campaigns like the CCA's *Paperboard Goes to War* endeavor.[42]

Much of this utilitarian, wartime work — including the plywood springs — is featured in *Design Workshops*. Especially notable is the film's interest in documenting the School's new 'Principles of Camouflage' courses, applying the School's formalist investments in the laws of vision and the manipulation of colour and light.[43] The courses were taught by Kepes under the auspices of the Office of Civilian Defense.[44] In his introductory lecture, Kepes described camouflage as an ideal site of interdisciplinary activity and collaboration, requiring 'the combined knowledge of people with a great variety of training — architects, engineers, painters, sculptors, graphic artists'.[45] As Robin Schuldenfrei has argued, camouflage entailed 'an almost seamless merging of important, originary Bauhaus ideals — the joining of the arts in work on a common goal'.[46] Like Moholy's media pedagogy more broadly, the camouflage courses were integrative

[42] Robin Schuldenfrei, 'Assimilating Unease: Moholy-Nagy and the Wartime/Post-war Bauhaus in Chicago', in *Atomic Dwelling: Anxiety, Domesticity, and Postwar Architecture*, ed. by Schuldenfrei (London: Routledge, 2012), pp. 87–126.
[43] Course catalogue, 'Principles of Camouflage Course', Box 3, Folder 76, UICIDC.
[44] John R. Blakinger, 'Camouflage 1942: Artists, Architects, and Designers at Ft. Belvoir, Virginia', in *Conflict, Identity, and Protest in American Art*, ed. by Miguel de Baca and Makeda Best (Newcastle upon Tyne: Cambridge Scholars Publishing, 2015), pp. 35–56.
[45] Kepes, quoted in Schuldenfrei, p.106.
[46] Schuldenfrei, p. 109.

in both method and aim — a performative poetics of the group that now includes *Design Workshops*.

In *Design Workshops*, the camouflage course sequence follows the display of a series of multi-coloured kinetic assemblages designed to produce mobile compositions of light, shadow, and colour, and *Papmac* (1943), one of Moholy's own kinetic Plexiglas paintings, which took advantage of a manufacturing defect in the bubbled material to fuse light and colour in a continuously changing composition. The editing demonstrates the compatibility between the School's aesthetic investigations into colour and light manipulation and the kind of functional illusion we see in our first glimpse of the camouflage courses, as a hand holding a red crayon traces a pattern in translucent paper above a reconnaissance photo to mask it from bombardment. Moholy's editing, which returns us to images of colour printmaking after observing the precise study of surface texture in the context of the wartime courses, insists that the camouflage skills and techniques featured in *Design Workshops* were part of a flexible colour practice and study at the School, and thus readily convertible to peacetime design applications in the domain of functional colour (whose experts, Blaszczyk reminds us, had often served as camoufleurs) and its purportedly scientific targeting of consumer tastes and moods.

As the urgency of war gave way to the anticipation of the post-war needs of consumers and industry, film production at the School didn't always square with the Foundation's evolving funding criteria for 'humanities' training. Writing to Paepcke in 1944, Stevens describes having 'put off' writing about Paepcke's request for a grant extension until having the chance to see Moholy's 'showing of his colour films here in New York City' (likely *Design Workshops* and *Do Not Disturb*).[47] While he compliments 'the intelligence of Moholy-Nagy's program as a means to general education', he explains that 'it is not easy from this material […] to get an idea of what Moholy-Nagy accomplished with those particular students'. With the colour films as evidence, Stevens 'does not now see cause to propose a larger or renewed grant' for developing film production at the School, even as Moholy was writing *Vision in Motion*, an elaborate justification of his humanities agenda and film's role producing a 'new kind of specialist' equipped with a socially integrated propensity for 'seeing, feeling and thinking in relationship and not as a series of isolated phenomena'.[48]

At the dawn of the post-war, Rockefeller bureaucrats monitored Moholy's School less in defence of a humanities mission oriented toward wartime 'communications', but rather with an eye towards funding links between art education and the needs of science, industry, and the post-war corporation. In denying Paepcke's request in May of 1945 for expanded photography operations following the war, Stevens framed it within 'a new field, for us, of art and

[47] 'School of Design, Institute of Design, 1939–1944', Box 61, Folder 1, WPP.
[48] *Vision in Motion*, pp. 21, 12.

industry'.[49] He noted that programs for teacher training, or occupational therapy courses in photography for vets, would not be funded 'under Humanities'. In doing so, he grouped these with other proposals submitted to the Foundation on 'varied forms of hand craft'.[50] And he hung the possibility of future funding on the conclusions of a report then being drafted by his colleague, Robert N. S. Whitelaw. The report, which aimed to evaluate present methods of teaching handicrafts in the US as well as the position of the craftsman vis-à-vis the post-war capitalist economy, offered a version of the humanities linked to a craft ethos that preserves skills 'that are economic factors or contributes to [national] growth', and dismisses as 'therapeutic' or 'sentimental' craft approaches (as in veteran rehabilitation) as ways of 'getting men out of step with our social structure'.[51] In this narrowly functional humanities vision, there is nothing of *Vision in Motion*'s insistence on a dynamic sense of history, or the capacity of a humane intermedial education to counter and critique a pervasive 'social ethics based on economic superiority rather than on the principles of justice'.[52]

Whitelaw's report acknowledged Moholy's desire to use the Institute as laboratory for the 'humanities to be handled in it in a new way, so the intellectual quality of one subject matter and can be felt and applied to another, and vice versa'.[53] But to Whitelaw's eyes, Moholy is 'too preoccupied with freedom of expression and release from convention', and the Institute's pedagogy 'too theoretical', and weakly tied to industry or engineering. After spending twenty hours with Moholy and Paepcke at the Institute, he concludes 'the major problem is one of communication with the public, other schools, and with other discoveries in science'. The solution to poor communication was more communication, despite Moholy's best efforts in the new colour-assisted administrative art of media messaging and packaging. Whitelaw suggested that Paepcke convene a Chicago-based forum on the subject of the 'relation of art to industry' in order to clarify 'what the Institute stands for' and answer the pressing question: 'Is it training teachers, designers, or people concerned with, as Moholy would put it, "the new education"?'[54] By Whitelaw's sights, the Institute's pedagogy could be understood as a skills-based, instrumental 'training' in various materials and media, or a vanguard, humanistic education, but not both at once. In framing the issue this way, Whitelaw missed the basic lesson of a handcrafted set of colour films like *Design Workshops*, which sought — like many of Moholy's photographs and photograms of the 1920s — to surpass the distinction between art and industry, or between specialization and holistic education, or between the expressive brushwork of a painter's hand and the mechanical, technical work of

[49] 'School of Design, Institute of Design, 1945', Box 61, Folder 2, WPP.
[50] Ivi.
[51] Robert N. S. Whitelaw, 'Handicrafts: Teacher Training in Handicrafts for the Humanities', Rockefeller Foundation Archives, Box 232, Folder 2765.
[52] *Vision in Motion*, p. 14.
[53] Whitelaw.
[54] 'School of Design, Institute of Design, 1945', Box 61, Folder 2, WPP.

modern photomechanical media. A new humanities education, of the sort *Design Workshops* allegorizes and promotes through various vanguard colour processes, would be both attentive to specific materials and material processes and broadly intermedial, indeed, interdisciplinary. *Design Workshops*' basic communicative task is to perform an increasingly imperilled theory of the humanities whose brand of 'integrated' training refused the very distinctions the Foundation drew as it anticipated the future of mid-century design education. In it, industrial craftsmanship would operate firmly in lockstep with a booming post-war economy that merged democracy, consumerism, and the 'humane' corporation in ways that Moholy, perhaps thankfully, would never see.

Hallucinating Colours: Psychedelic Film, Technology, Aesthetics and Affect

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> Words [...] are static, whereas the psychedelic experience is fluid and ever-changing.
>
> (Timothy Leary, *The Psychedelic Experience*)

Abstract

Within the context of the ERC Advanced Grant *Filmcolors* I investigate subjectivity, affect and aesthetics from an historical perspective, drawing on ideas developed within the field of the history of emotions. However, while most of this research is of a synchronic nature, my work contains a strong diachronic component, based on Fernand Braudel's concept of the 'pluralité des durées' (*La Méditerranée*, 1966). Following Braudel, I distinguish three layers: 1. the layer of slowly changing affects and connected 'topoi'; 2. the foundational layer of culture and discourse; and 3. the film under investigation. In this essay, I lay out my theoretical and methodological reflections by focusing on colour patterns used in films that represent hallucinations. I will lay out several examples of hallucinatory scenes (level 1) and explain their common (biological) grounds. Further, I will zoom in on 1960s psychedelic culture characterized by hallucinating drug use as entertainment and as therapeutic tool (level 2). The film of interest (level 3) is *The Trip* (Roger Corman, 1967), which precisely represents this culture. A combination of the analyses of the three levels brings interesting new perspectives on the 1960s, its psychedelic film culture, and how this relates to the topos of colourful hallucinations.

A flowery pink cloth drops to the floor, unveiling the back of a dark-haired woman as she walks towards a man lying on a bed. Coloured patterns dance over their bodies as they start kissing. The camera moves to the right, panning across the room to a fireplace covered in multicoloured projections of moiré patterns. It then moves back to the bed where we suddenly see a blonde woman sitting next to the couple, watching them make love. The film cuts to a series of shots of the embracing couple from various angles, focusing on different parts of their bodies that are covered in shifting psychedelic colours and patterns, accompanied all

the while by pulsing music. Throughout, the two women repeatedly alternate, taking one another's place. Towards the end, the frame is split into several parts that circle around each other, giving the impression of a kaleidoscopic insect-eye view of the scene.

This three-minute sequence, which I will call the 'rainbow love scene', comes from Roger Corman's film *The Trip* (1967). It shows the film's main character Paul Groves in the grip of an LSD hallucination in which he appears to be making love to his ex-wife (the dark-haired woman) who is repeatedly replaced by the blonde woman. The sequence is simultaneously sensual, erotic and abstract. Its colours are also hallucinatory, in a way that is characteristic of the 1960s. Yet, the idea of creating a surreal atmosphere with the help of disconcerting colour sequences is a cinematic tactic that has frequently been used throughout film history to represent hallucinatory experiences on screen. As such, what gives this fragment such a strong 1960s look while at the same time remaining effective as a representation of a hallucinatory, dream-like event? In other words, in what ways does the representation of hallucinations in film follow more general aesthetic strategies, and which of its elements are specifically characteristic of a certain time period?

This question is part of a larger research project on the history of colour in film, with a focus on technology, aesthetics and subjectivities that I am conducting in the context of the ERC Advanced Grant project *FilmColors*.[11] The research team first analysed a large number of films to discover if distinct patterns could be discerned in their colours, surfaces, texture and lighting. My own research interest lies in how this relates to the representation of affect, emotion and subjectivities in film, and one area that I examine closely is the depiction of hallucinations.

One of the first problems I encountered in this research was the question of whether I could historicise affect and subjectivities. Over the past twenty-five years, media studies has witnessed the development of a variety of methodologies to examine affect and emotion in film and other moving images with the help of theoretical perspectives adopted from phenomenology, cognitive psychology and branches of philosophy concerned with the concept of 'affect'. Scholars engaging in this work include Vivian Sobchack, Laura Marks, Jennifer Barker, Carl Plantinga, Julian Hanich, Raymond Bellour, Eugenie Brinkema, Scott Bukatman, and Steven Shaviro. However, most of these studies tend to investigate affect ahistorically.[22] This is problematic because, like every other element of culture, the visual representation of affect and emotion is historically determined.

[11] This project has received funding from the European Research Council (ERC) under the European Union's Horizon 2020 research and innovation programme, grant agreement No. 670446, *FilmColors. Bridging the Gap Between Technology and Aesthetics*. Primary Investigator: Professor Barbara Flueckiger: <http://www.research-projects.uzh.ch/p21207.htm> [accessed 25 January 2019].

[22] Eugenie Brinkema does give general historical overviews at the beginning of her chapters of the concept under investigation. However, in my opinion, the film analyses as such remain rather

Fortunately, this issue has been addressed through the framework of 'media archaeology'. In his book *What Is Media Archaeology*, Jussi Parikka explains that what distinguishes the approach from other methodologies in affect studies is its historical account of embodiment and its focus on technological conditions.[3] As such, media archaeology combines formal film analysis, technological and material history and the history of ideas.

Another approach is that of E. Deidre Pribram, a film and television studies scholar who focuses on media and emotion in a historical context.[4] Her work is part of a relatively recent movement in cultural history known as the 'history of emotions'. Jan Plamper lays out the ground principles of this approach in his book *The History of Emotions*.[5] As Plamper notes, various theories and methodologies have been introduced into the domain to analyse in particular the socially constructed nature of emotions.[6] Another problem Plamper approaches in his book is the question if affects and emotions are culturally or biologically determined. However, even though the question of 'nature vs. nurture' is constantly brought up in the debate, it seems that the questions whether emotions and affects can also be biological, relatively stable entities remain unanswered. In fact, the entire nature vs. nurture — or cultural vs. universal — discussion is mentioned and discussed, but not structurally taken into account when analysing the history of emotions and affects.

In order to address this problem of nature vs. nurture, I draw from the concept of the '*pluralité des durées*' in historical time introduced by Fernand Braudel. Braudel's study consists of three parts. Each part describes and analyses a specific temporal layer in the history of the Mediterranean. He distinguishes a history that is 'quasi-immobile' meaning that it hardly changes over time, the history of groups and groupings that manifest a slow rhythm of change and a rapidly changing history, that of individuals and individual events.[7] I use these ideas as a template for my study of affect and emotion in film, introducing a similar but slightly modified distinction in layers of historical temporalities.

Braudel's layer that covers the quasi-immobile milieu, is related to nature

ahistorical in their nature. See: Eugenie Brinkema, *The Forms of the Affects* (Durham: Duke University Press, 2014).

[3] Jussi Parikka, 'Media Archaeology of the Senses. Audiovisual, Affective, Algorithmic', in *What is Media Archaeology?* (Cambridge: Polity Press, 2012), pp. 19–40.

[4] Deidre Pribram, *Emotions, Genre, Justice in Film and Television: Detecting Feeling* (New York: Routledge, 2011).

[5] Jan Plamper, *The History of Emotions: An Introduction* (Oxford, New York: Oxford University Press, 2017), p. 68.

[6] Barbara H. Rosenwein and Riccardo Cristiani, *What Is the History of Emotions?* (Malden, MA: Polity, 2018); Monique Scheer, 'Are Emotions a Kind of Practice (and Is That What Makes Them Have a History)? A Bourdieuian Approach to Understanding Emotion', *History and Theory*, 51 (2012), 193–220; Anna Parkinson, *An Emotional State. The Politics of Emotion in Postwar West German Culture* (Ann Arbor: University of Michigan Press, 2015).

[7] Fernand Braudel, *La Méditerranée et le monde méditerranéen* à *l'époque de Philippe II* 9th edn, 3 vols (Paris: Armand Colin Éditeur, 1949), i, 16–17.

and the way the environment influences human behaviour. This layer partly corresponds to Plantinga's idea of 'direct affect'. In his book *Moving Viewers*, Plantinga argues that '[s]pectator responses to movements, sounds, colours, textures, and manifestations of space are in large part automatic and pre-reflective', and that their reactions to what happens on screen are partly rooted in 'natural perceptual responses that have developed over long periods of human history'.[8] In other words, these more physiological reactions change at a very slow (quasi-immobile) pace. In my opinion, the physical component of colour perception and the way it affects the body is such a constant factor. This provides a good starting point from which to investigate the quasi-immobile history of colour perception and how it relates to film and affect. In a study on affect and colour, this gradual pace of change corresponds to the slow evolution of human perception and the human visual system — the eye and optical nerves.

However, the concept of 'direct affect' as a direct bodily response to the filmic representation is not exclusively governed by these 'natural perceptual responses'. Plantinga explains that films can also affect spectators according to social conventions and cultural constraints. This brings us to another temporal layer — that of cultural and social discourses relating to colour and affect in film. This layer is determined by the aesthetic and cultural context in combination with the technological possibilities and constraints of the period. Finally, my proposal is that a last temporal layer should cover the filmic events and structures that propel them in the direction of affect. The attempt to address this problem needs to be grounded in the close reading, formal analysis and interpretation of individual films and their colours.

In my opinion, one of the main problems in studying affect and emotion in film is that the implicit *durées* show relatively large variations depending on the elements under scrutiny. This is precisely why it is necessary to investigate all three layers in order to gain a clearer understanding of how colour and affect in film function at different moments of history. To explore this, it is worth returning to the representation of hallucinations in film and specifically to the psychedelic visual culture of the 1960s, taking Roger Corman's 1967 film as a starting point. This brings me back to the questions I formulated in the beginning of the essay: in what way does *The Trip* fit 1960s colour and psychedelic visual culture and what are the characteristics that also speak to more *longue durée* characteristics of hallucinatory imagery?

I started my investigation of hallucination in colour films by searching our analysis database and indeed found a large number of hallucinatory scenes where the distortion of perception was represented by colours that deviate from those that humans 'normally' perceive. Some of the examples include *Nerves* (*Nerven*, Robert Reinert, 1919); *Warning Shadows* (*Schatten eine Nächtliche Halluzination*, Arthur Robinson, 1923), *Blanche Fury* (Marc Allégret, 1948), *Vertigo* (Alfred

[8] Carl Plantinga, *Moving Viewers: American Film and the Spectator's Experience* (Berkeley: University of California Press, 2009), p. 117.

Hitchcock, 1958), *2001: A Space Odyssey* (Stanley Kubrick, 1968), *The Man Who Fell to Earth* (Nicolas Roeg, 1976), *Apocalypse Now* (Francis Ford Coppola, 1979), and of course *The Trip*.

The correlation between the use of colour and hallucinatory scenes is clearly discernible in each of these films. In *Nerves*, for example, the scenes that show hallucinations are tinted pink, and in *Blanche Fury* the hallucination is represented through the image turning red, while Hitchcock's *Vertigo* presents a close-up of the main character of Scottie as he breaks down and hallucinates while the image turns monochrome red, purple and blue. This technique is also used in *The Trip* where the image of the main character Paul Groves as he hallucinates turns monochrome yellow, red, green, blue and purple. The correlation between hallucinations and the transformation of everyday colours into uncanny and unexpected hues is an aspect often remarked on in the literature on the subject. In his book *Hallucinations*, Oliver Sacks gives multiple examples of testimonies of hallucinatory experiences that mention strange, bright, saturated colours.[9] For example, Sacks quotes Daniel Breslaw, a subject in the LSD experiments undertaken at Columbia University in the 1960s, who claimed to have experienced colours that he had never seen before in real life.[10] The use of colours that deviate from the common experiential norm to represent the hallucinatory and imaginary is something we encountered over the entire corpus of films studied from 1895–1995 in our research and is corroborated by many of the testimonies recorded in the literature beyond film history. Therefore, it is plausible that this combination is similar to a topos, which can be loosely defined as a reoccurring theme in cultural utterances.[11] At the same time, this topos moreover shows strong connections to the quasi-immobile or slowly-changing pace of the physical experience of hallucinations.

Even though hallucinations occurred over the entire period we investigated, the 1960s showed an extra-colourful interest in this type of imagery. Films such as *Marnie* (Alfred Hitchcock, 1964), *Rosemary's Baby* (Roman Polanski, 1968), *Barbarella* (Roger Vadim, 1968), *Psych Out* (Richard Rush, 1968) are films from the decade that particularly stood out. We also encounter a more indirect reference to hallucinations, tripping and drug use in *2001: A Space Odyssey*. The film ends famously with a colourful sequence in which we witness the astronaut Dave Bowman's experience of dying and rebirthing in an astral form.[12] Whereas this final scene is not narratively embedded as relating to a psychedelic hallucination, it was perceived as representing one, quickly drawing large numbers of pot-smoking 'hippies' into the cinema in

[9] Oliver Sacks, *Hallucinations* (London: Picador/Pan Macmillan, 2012).
[10] Ivi, p. 143
[11] Erkki Huhtamo, 'Dismantling the Fairy Engine. Media Archaeology as Topos Study', in *Media Archaeology: Approaches, Applications and Implications*, ed. by Huhtamo and Jussi Parikka (Berkeley: University of California Press, 2011), p. 29.
[12] Douglas Trumbull, 'Creating Special Effects for *2001: A Space Odyssey*', *American Cinematographer*, 49.6 (1968), 416–19 and 451–53 (p. 452).

1968. A year later, the aforementioned scene became known in these circles by the epithet 'the trip'.[13]

The special effects for this sequence were the work of Douglas Trumbull, who used the slit-scan technique to produce the impression of fast forward movement through a corridor of abstract coloured images. He was inspired to use slit-scan technology by the work of experimental filmmaker John Whitney. However, whereas Whitney moved the slit across the frame to produce abstract coloured images, Trumbull made it travel in depth by moving the camera towards the slit while photographing moving images behind it.[14] The result is a sequence with extremely coloured movement giving the impression of flying with great speed through a space corridor. This sequence is intercut with still images of Dave Bowman's face.

In addition, and maybe more importantly, Kubrick (and Trumbull) seem to have been inspired by experimental film in a more aesthetic way. Especially the abstract images and sounds after the corridor show great similarities to the work by Jordan Belson so much so that Pauline Kael did not hesitate to call it theft.[15] Since Belson is known for having used peyote and other hallucinogens for his visions, this might explain why spectators interpreted the *2001*-scene as a trip.[16] This level of our investigation relates to the second layer, which is that of the cultural context.

In order to delve deeper into 1960s psychedelic culture, hallucinations in film and their relationship to colour, I will take the film *The Trip* as the individual level of the event. The analysis as such will move through the temporal layers, from the 'event' or, in this case, the film, to the layer of cultural and technological context, to that of the quasi-immobile perception of colours, and back. *The Trip* centres on Peter Fonda in the role of Paul Groves, a director of advertising films, who is going through a painful divorce. In an attempt to heal himself, he decides to take LSD in a therapeutic setting. The film mainly shows the actual trip Groves experiences. Another actor involved in the film was Jack Nicholson, who presumably wrote the scenario, although Chuck Griffith is also mentioned as the author of the 'original' script.[17] Both Nicholson and Griffith had taken LSD and were writing from experience. Dennis Hopper, another actor who dabbled in LSD, appears in the film as a hippy passenger in Groves' reality and in his hallucinatory trip.[18]

[13] Trumbull, 'The "Slit-Scan" Process as used in *2001: A Space Odyssey* and beyond', *American Cinematographer*, 50.10 (1969), 998–1001, 1012–13, 1016–17, 1020–22 and 1024–26 (p. 998).
[14] Ivi, pp. 998–99; Gene Youngblood, *Expanded Cinema* (London: Studio Vista, 1970), pp. 151–56.
[15] Pauline Kael, 'Trash, Art and the Movies', in *Going Steady. Film Writings, 1968–1969* (New York: Bantam, 1970), p. 124.
[16] Youngblood, p. 159.
[17] Beverly Gray, *Roger Corman: Blood-sucking Vampires, Flesh-eating Cockroaches, and Driller Killers* (New York: Thunder's Mouth Press, 2004), pp. 87–88.
[18] Nickolson, Fonda and Hopper are also known for their appearance together in the film *Easy Rider* (Dennis Hopper) that was released two years later, in 1969.

According to Corman, everyone involved in the production had taken LSD, including Corman himself, who tried it specifically for the film.[19] Apparently Corman had travelled to a picturesque seaside cliff in Big Sur, California, with his assistant Frances Doel as a 'guide'. Whereas Corman took the drugs his assistant did not, and was merely present to witness and assist with the 'exercise'. It appears that Corman had a magical experience, seeing spellbinding images; however, because he felt he owed his audience an obligation of truth, he also talked to those who had experienced 'bad trips' and included their testimonies in the film.[20] To transmit these experiences and testimonies through the medium of film, Corman 'relied on hallucinatory visual images in dazzling color'.[21]

Indeed, a brief investigation of Dutch newspapers from 1968 and 1969 resulted in a number of interesting critiques of *The Trip*. Most of them mentioned the colours of the film as extraordinarily beautiful and 'crazy', and claimed they represented the LSD experience quite faithfully.[22] One critic even praised the film laboratories for their work in creating such colours.[23] The film's intense colours were also referred to on its poster as 'psychedelic', directly connecting colour to LSD-induced hallucinations.[24]

In the narrative exposition at the start of *The Trip* we are introduced to the main character, Paul, his wife Sally (Susan Strasberg) and John (Bruce Dern), who is there to guide Paul through his LSD experience. In passing, we encounter (mostly stoned) figures who re-appear in Paul's hallucination, such as the archetypical hippy, Max (Hopper), and the beautiful blonde, Glenn (Salli Sachse). Towards the end of the film's opening sequence, Paul and John enter an apartment decorated in psychedelic colours. It is here that John gives Paul the LSD and makes him lie down on a couch, where he covers his eyes to help induce the psychedelic mode of perception. After a moment of darkness, we start to hear music over the sound of Paul's beating heart. At the same time, multi-coloured abstract shapes follow each other in rapid succession. The 'rainbow love scene'

[19] Constantine Nasr, *Roger Corman: Interviews* (Jackson: University Press of Mississippi, 2011), p. 88.

[20] Pawel Aleksandrowicz, *The Cinematography of Roger Corman: Exploitation Filmmaker or Auteur?* (Newcastle upon Tyne: Cambridge Scholars Publishing, 2016).

[21] Gray, pp. 87–88.

[22] Bob Bertina, 'Cinemanifestatie Utrecht 68. LSD-trip', *Volkskrant*, 7 February 1968, p. 9; Henk van der Meyden, 'Ontkleed meisje op VPRO-scherm/Start nieuwe stijl maar: Wat gebeurt er met "De Trip" in Nederland', *Telegraaf*, 10 October 1967, p. 15; C.B. Doolaard, 'Corman proeft aan LSD', *Parool*, 1 March 1968, p. 17; 'TRIP met LSD. 't blijft bij een poging', *Vrije Volk*, 8 November 1968, p. 21; A. van O., 'The trip. LSD-reis als te mager thema', *Nieuwsblad van het Noorden*, 31 January 1969, p. 14; Henk ten Berge, 'Veel filmgeweld op de Cinemanifestatie. Peter Fonda werd "high"', *Telegraaf*, 7 February 1968, p. 13. All clippings were found in the amazingly rich digital newspaper archive from the *Koninklijke Bibliotheek* in The Netherlands called Delpher. See: <https://www.delpher.nl/> [accessed 25 January 2019].

[23] Doolaard, p. 17.

[24] For poster see IMDB: <https://www.imdb.com/title/tt0062395/mediaviewer/rm3665102336> [accessed 15 October 2018].

that occurs soon after this first experience also uses such kaleidoscopic patterns. First, the coloured light projections contain patterns that are similar to abstract kaleidoscopic images. Then, towards the end of the scene, the frame splits into four or more different parts, resulting in a multiplication of moving images, giving the perception of the kaleidoscopic effect of seeing the world through an insect's compound eyes.

In 1960s cinema, such kaleidoscopic abstract imagery to stand in for hallucinatory and altered states was not specific to *The Trip*. For example, Eric Duvivier, who made medical films for pharmaceutical companies, also used kaleidoscopic images in some of his films of hallucinations such as *Images du monde visionnaire* (co-directed with Henri Michaux, 1963).[25] Other examples are *Fahrenheit 451* (François Truffaut, 1966) in which kaleidoscopic images appear on television sets, hypnotising their viewers. The British film *Curse of the Crimson Altar* (Vernon Sewell, 1968) also shows kaleidoscopic images to simulate the experience of hypnosis.[26]

These colourful, abstract shapes are what Sacks calls 'simple hallucinations'.[27] Psychologist Heinrich Klüver observed that these types of hallucinations are common in a variety of pathological and situational phenomena such as migraine (the migraine's 'aura'), sensory deprivation (the 'prisoner's cinema'), hypoglycaemia, fever, delirium, and the hypnagogic state directly before and after sleep. Of course, psychedelic drug use can also bring about these types of hallucinations. Albert Hofmann, who was the first to synthesize LSD in 1938 and who accidently tested it on himself, testified to what he saw as 'an uninterrupted stream of fantastic images of extraordinary plasticity and vividness and accompanied by an intense kaleidoscopic play of colors'.[28]

The persistent recurrence of descriptions of multi-coloured, abstract, kaleidoscopic images over a larger time frame permits us to categorize them as examples of the 'quasi-immobile' of visual hallucinations. Some psychologists and researchers suggest that these visions have a universal biological origin.[29] For example, Klüver, in his book, *Mechanisms of Hallucination* (1942), suggests that 'such constants must reflect something about the organization, the functional architecture, of the visual cortex'.[30] In other words, he claims that what we are witnessing in such an experience are our own nerves and synapses firing off electricity. Following Klüver, mathematicians and neuroscientists continued

[25] This film is based on Henri Michaux writings on his experiences with mescaline and hashish. Henri Michaux, *Miserable Miracle* (Paris: Gallimard, 1956), Michaux, *L'infini turbulent*, 1968th ed. (Paris: Mercure de France, 1957), Michaux, *Connaissance par les Gouffres* (Paris: NRF, Le point du jour, 1961)

[26] <https://eastmancolor.info/2018/10/11/hypnosis-as-spectacle-in-british-horror/> [accessed 15 October 2018].

[27] Sacks, p. 26.

[28] Hofmann in Sacks, p. 136.

[29] Ivi, p. 190.

[30] Klüver in ivi, pp. 141–42.

to investigate and confirmed potential connections between primary visual hallucinations and the way the visual cortex is shaped and functions.[31]

As such, it should be of no surprise that kaleidoscopic images were a popular staple of visual culture (a topos) for a longer period. One example is the well-known nineteenth-century kaleidoscopic lantern slides that were manually cranked to make the colours swirl around and over each other. Interestingly, as film historian Joshua Yumibe explains, these nineteenth-century toys were a form of entertainment 'to shape the viewer's subjective perception to an orderly system that rationalized space, time, and color'.[32] In other words, they were the result of scientific investigation of optics and perception and were partly meant to test hypotheses on the senses and perception, and partly to re-educate and discipline the observer into a modern one.[33]

The fact that the kaleidoscopic, multi-coloured images in *The Trip* were part of a strategy to show the inner perception of a hallucination turns this rationalizing function upside down. Instead of ordering and rationalizing, these images unleashed colours that were out of control, challenging chromatic vision. As such, they fit perfectly with Kirsten Moana Thompson's description of the psychedelic counterculture's use of colour in the 1960s: 'Whereas in Western culture we tried to control colour with the help of colour-cards, colour harmonies, colour consultants, and colour psychology, in the 1960s colour was being unleashed especially in the psychedelic culture.'[34] However, placing these insights in a wider perspective entails diving a little deeper into the second level of the 'milieu' formed by the psychedelic culture and the use of LSD, characteristic of the 1960s.

The aforementioned poster of *The Trip* not only refers to its colours as 'psychedelic', it also announces the film as 'A Lovely Sort of Death' ('LSD'). This slogan refers to *The Psychedelic Experience: A Manual Based on the Tibetan Book of Dead* (1964) by Timothy Leary, which Corman read before making *The Trip*.[35] In his book, Leary follows the structure and logic of *The Tibetan Book of*

[31] G. B. Ermentrout and J. D. Cowan, 'A Mathematical Theory of Visual Hallucination Patterns', *Biological Cybernetics*, 34.3 (1 October 1979), 137–50, <https://doi.org/10.1007/BF00336965> [accessed 25 January 2019]; Jennifer Ouellette, 'A Math Theory for Why People Hallucinate', *Quanta Magazine*, 30 July 2018, <https://www.quantamagazine.org/a-math-theory-for-why-people-hallucinate-20180730/> [accessed 25 January 2019]; Eric Tkaczyk, 'Pressure Hallucinations and Patterns in the Brain', *Morehead Electronic Journal of Applicable Mathematics*, 1 (2001), 1–26; Paul C. Bressloff and others, 'What Geometric Visual Hallucinations Tell Us about the Visual Cortex', *Neural Computation*, 14.3 (March 2002), 473–91, <https://doi.org/10.1162/089976602317250861> [accessed 25 January 2019].

[32] Joshua Yumibe, *Moving Color: Early Film, Mass Culture, Modernism* (New Brunswick, NJ: Rutgers University Press, 2012), p. 141.

[33] Ivi, p. 24.

[34] Kirsten Moana Thompson, 'Falling in(to) Color. Chromophilia and Tom Ford's *A Single Man* (2009)', *The Moving Image*, 15.1 (2015), 62–84.

[35] *The Movie World of Roger Corman*, ed. by J. Philip Di Franco (New York: Chelsea House Publishers, 1979), pp. 48–49.

the Dead, which describes the travels/experiences of the soul between dying and reincarnation.[36]

Leary was a psychologist with a doctorate from the University of California, Berkeley. After spending time working at universities in various countries, he started lecturing at Harvard in 1959, where he founded the Harvard Psilocybin Project with Richard Alpert. The project's aim was to research the effects of LSD and psilocybin on human consciousness.[37] In 1963, however, the project was halted by the university management, and Alpert and Leary were both fired. Although the Harvard Psilocybin Project might seem a strange and dangerous experiment today, the use of LSD in psychology, psychotherapy and psychiatry was well established at the time.[38] However, as the 1960s progressed, attitudes changed, and the use of LSD became increasingly less accepted, until the drug was finally declared illegal in 1968 in the United States, except for medical research.

After his dismissal, Leary became renowned as a public countercultural figure. He continued his experiments and defended the use of drugs as a mind-opening therapeutic method. His catch-phrase, 'Turn on, tune in, drop out', encouraged 'turning on' the psychedelic experience (like a TV set), 'tuning in' to the right experiential wave length, and then 'dropping out' from the experience itself and back into 'normal life', integrating this so-called 'psychedelic perception' into everyday experience. Leary even claimed that it was media philosopher Marshall McLuhan, whom he knew and admired, who inspired him to use a catch phrase to promote his ideas.[39]

McLuhan was convinced that the ways in which media influences, shapes and perceives the world needed more thorough investigation. As such he considered media to be the message, the source of information for his research, more than the content they distributed.[40] The premise that external factors had such strong effects on the human mind, dovetails very well with Leary's ideas on LSD. Leary propagated the notion that LSD inspired people to question social norms, and it consequently had the power to transform society: 'LSD rearranged the "imprinting process" in the human mind and allowed people to rethink things they had previously taken for granted.'[41] This discourse was part of the 1960s counterculture, a movement that was defined by its rejection of the establishment

[36] The reference to the *Tibetan Book of the Dead* in relation to hallucinations and drugs is also made in *Enter the Void* (Gaspar Noé, 2009).
[37] <https://psychology.fas.harvard.edu/people/timothy-leary>[accessed 16 October 2018].
[38] The Wikipedia page on LSD is a good starting point for those who want to know more about the history of LSD, <https://en.wikipedia.org/wiki/History_of_lysergic_acid_diethylamide#> [accessed 16 October 2018].
[39] See Lisa Rein and Michael Horowitz, 'Timothy Leary and Marshall McLuhan, turned on and tuned in', *Boing Boing*, 2014, <https://boingboing.net/2014/06/03/timothy-leary-and-marshall-mcl.html> [accessed 17 October 2018].
[40] Marshall McLuhan, *Understanding Media: The Extensions of Man* 5th edn (Cambridge, MA: MIT Press, 1964); Rein and Horowitz.
[41] Scott Stephenson, 'LSD and the American Counterculture: Comrades in the Psychedelic Quest',

— LSD use was prevalent amongst those who identified with the movement. The idea was that LSD would help to loosen the grip of existing rules and regulations that limit perception and imprison the body and mind, and to set perception free.[42]

These beliefs seem to come together in the 'rainbow love scene' in which Paul makes love to Sally and Glenn. First of all, the scene represents the 1960s 'summer-of-love' theme of free sex, which relates to freedom of mind, imagination and choice of partners. Second, through its edited close-ups on the sensuous movements of Sally's feet, the sound-track of her moaning and the excessive colours, the scene strongly implies female orgasm, which could be seen as the liberation of the female body and sexuality.[43] Especially interesting here is the connection between the female orgasm and colour, which occurs in other films. For example, when Janet Weiss from *The Rocky Horror Picture Show* (Jim Sharman, 1975) experiences an orgasm during the song 'Toucha, toucha, toucha, touch me' she is covered in rainbow coloured light, or the scene in *Barbarella* when Durand Durand tries to kill Barbarella with a colour organ causing deadly orgasms. Third, the scene shows fluctuating colours in constant movement, ceaselessly shifting camera angles and positions, people and shapes, making the 'psychedelic vision as a burst of freedom and mobility' visible in a sensuous way, challenging 'normative modes of perception' and 'calling into question the rigid and repressive conceptions of reality and consciousness'.[44]

Not only were society rules and regulations challenged by *The Trip*, but the film also pushed the possibilities of the colour technology. The film's special effects technician, Bob Beck, wrote an article in 1968 on the making of the film in *The American Cinematographer.* He dwells extensively on the multi-coloured love scene, discussing the technological problems they had in shooting it. The light sensitivity of the film material available at the time was too low to film the gloomy atmosphere created by the projection of the coloured lights onto the moving bodies; there was a risk that when creating the 'general mood effect' there would not be enough light to also create the 'projected psychedelic effect': 'Even with extensive modifications, the amount of light on the subjects was only around 24-foot candles, which meant that our film, Eastman Color Negative, had to be processed to an ASA rating of 200 by the Pathé Laboratories.'[45] The Eastmancolor 5251 negative stock that was available in 1967 had a light sensitivity

Burgmann Journal, III (2014), <https://www.academia.edu/11558803/LSD_and_the_American_Counterculture_Comrades_in_the_Psychedelic_Quest> [accessed 16 October 2018].

[42] Andrew Syder, '"Shaken out of the Ruts of Ordinary Perception": Vision, Culture and Technology in the Psychedelic Sixties' (unpublished doctoral thesis, University of Southern California, 2009), p. 30.

[43] Anna Powell, *Deleuze, Altered States and Film* (Edinburgh: Edinburgh University Press, 2012), pp. 67–68.

[44] Syder, p. 30.

[45] Bob Beck, 'Creating "Psychedelic" Visual Effects for "The Trip"', *American Cinematographer*, 151.3 (1968), 176–79.

of 50 ASA, which meant that the amount of pushing needed for exposure was not extreme but significant enough to potentially increase the visibility of the grain in the photographic image. The result is a sombre, relatively dark though still colourful image, full of movement and fluidity. Because of the increased graininess, the images may have become even more abstract than was originally intended.[46]

Andrew Derek Syder argues that attempts to simulate acid trips on screen in psychedelic films such as *The Trip* also challenged the visual codes and spectator positions associated with classical cinema. Unfortunately, he does not give any direct examples to illustrate this claim.[47] However, the 'rainbow love scene', with its coloured light projections, does come close to challenging what was technically possible. The scene's colour projections are directly connected to the counterculture party scene of the 1960s. Beck himself was a self-made light engineer, developing and renting out equipment for light shows that were held with the help of overhead projectors, liquids and sometimes film.[48] The 1960s was the decade of psychedelic music, immersive 'happenings', 'expanded cinema' and 'LSD art', which was not only exhibited in discotheques, night clubs, and other music venues but also in museums and art galleries.[49] One of the aims of LSD art was to reproduce the sort of psychedelic perceptions that occurred when taking mind-expanding drugs.[50] For example, the media art collective USCO, which presented so-called 'psychedelic theatre', claimed that their art had the potential to function in a similar way to LSD. The group explicitly took as its philosophical basis the theories of Marshall McLuhan who, as I mentioned before, argued that the way media influence how we shape and perceive the world needs more thorough investigation. USCO tried to put McLuhan's injunction into effect by reproducing the experience of an LSD hallucination in an immersive multimedia event: they employed projection techniques that used the entire space as a screen, including the bodies of the spectators in order to experiment with and study the very ways in which these techniques shape perception.

With its colourful patterns projected on walls, furniture and bodies, the

[46] This might explain why people seem to miss the fact that Paul is making love to two women instead of one. For example: Bertina, and Powell.

[47] Syder, p. 7.

[48] He even wrote a manual for do-it-yourself light shows. See Robert C. Beck, *Color Games Light Show Manual* 3rd edn (Los Angeles: Pericles Press, 1966).

[49] One of the best-known examples of this practice is the Exploding Plastic Inevitable, a sort of Gesamtkunstwerk installation art by Andy Warhol, the Velvet Underground and Nico. In 1967 Ronald Nameth made the film *Exploding Plastic Inevitable* based on registrations made during the shows. He filmed on Ektachrome and had the same problems with the light sensitivity as Bob Beck. He also had the material pushed, which resulted in an increased graininess of the images (source: email exchange with Ronald Nameth, 2017).

[50] Howard Junker, 'LSD: "The Contact High"', *Nation,* 5 July 1965, <https://www.thenation.com/article/lsd-contact-high/> [accessed 5 March 2018]; 'New Experience that Bombards the Senses. LSD Art', *LIFE Magazine*, 9 September 1966, pp. 60–69; 'Wild New Flashy Bedlam of the Discothèque', *LIFE Magazine,* 27 May 1966, pp. 72–76.

rainbow love scene mirrors this practice. However, whereas in *The Trip* the viewer watched the LSD experience in a more classical way (that is, seated in a cinema, their experience was strongly dependent on their identification and engagement with the character Paul onscreen), USCO tried to replicate the experience by immersing the spectator in the performance itself, 'bombing their senses' with light and sound.

Recapping, the close-reading of the film *The Trip* (layer of event) showed several connections and relations to both the layer of culture and discourses, and that of colour perception and hallucinations. As a result, it is clear that the film is strongly rooted in the cultural context of psychedelic culture and its accompanying colour performance culture, which explains why the film has such a strong 1960s 'look'. At the same time, the film uses reoccurring patterns such as kaleidoscopic images, saturated colours, and moving colours to visually represent hallucinations. These are elements that are part of the 'quasi-immobile' way the human body and mind produce internal imageries when hallucination occurs, and which entered our visual culture as topoi as well.

The analysis here of hallucinations from the perspective of 'pluralité des durées' has proven to be very productive. The possibility to jump from one layer to the other, and to be aware of it, allows for interesting comparisons which bring about deeper understandings of colour films and colour cultures.

Beyond Cinema

The Body as Virtual Frame: Performativity of the Image in Immersive Environments

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Abstract

Immersive environments perceived through head-mounted displays allow us to experience a tridimensional virtual space, no longer limited by the frame boundaries which have traditionally characterized our perception of images. By virtue of its capacity to overcome the image threshold, virtual reality is often described as the most powerful tool for incorporating the perception of the other, that is as the 'ultimate empathy machine'. The idea of dissolving the image frame is also the theoretical pivot of A.G. Iñárritu's latest virtual reality work *Carne y Arena*, in which the Mexican director implemented unprecedented virtual technologies in order to tell the experience of a group of refugees trying to cross the border between Mexico and the United States. Through an analysis of Iñárritu's installation, I aim to undo the empathy and immersive rhetoric through which VR contents and devices are presented, and argue instead that VR experience is pierced by a number of discontinuities and gaps in perception, with largely neglected potentialities. By interrogating the overlapping of the limits of the image, the boundaries of the body and those that are established by geographical and biopolitical borders, I show how in virtual reality, if the frame of the image seems to disappear, then the very function of *framing* does not dissolve, but, rather, is assumed by the experiencer's body and embodied gaze.

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Beyond the Frame Boundaries?

In the past few years, as virtual reality approaches large scale and mainstream consumer use, a vibrant ecosystem has emerged. Immersive and interactive virtual environments perceived through head-mounted displays make us increasingly familiar with the experience of being incorporated into a new and autonomous world, conveying the feeling of being in a place other than our physical location, in a so-called frame-free infinite space, no longer limited by the boundaries which have traditionally characterized our perception of images. VR experience is frequently described as projecting the spectator 'beyond the screen', making her forget where she is, so that she can reach a 'sensation of total immersion and presence'.[1]

Different contributions have emphasized in diverse ways the capacity of virtual environments to achieve a strong sense of presence and immersion, as well as the way recent developments in image-making techniques result in blurring the threshold between the image world and the real world.[2] Virtual reality interfaces set out a 360° illusory environment, in which different interfaces allow the spectator, or rather the experiencer, to wander around space, either by physical motion, head movement or motion simulation. Hence, the viewer is no longer subject to the segregation defined by the limits of the image, in which immersion is by definition never 'total'. As Steven Spielberg said in his speech at the symposium inaugurating the new building of the University of Southern California Film School: 'We're never going to be totally immersive, as long as we're looking at a square, whether it's a movie screen or whether it's a computer screen.'[3]

The idea of dissolving the image frame is also the theoretical pivot of Alejandro González Iñárritu's latest virtual reality work *Carne y Arena*, in which the Mexican director implemented unprecedented virtual technologies in order to tell the experience of a group of refugees trying to cross the border between Mexico and the United States. With this ground-breaking work (realized in coproduction with the Fondazione Prada and premiered at the 2017 Festival de Cannes, then presented at the Fondazione Prada Museum in Milan, at the Los Angeles County Museum of Art, and at Washington D.C.), Iñárritu wanted the spectators to be able to actually feel and immerse themselves in the migrants' precarious

[1] As it was stated, for instance, by the 2016 campaign for the launch of PlayStation VR device by Sony, 'Sony Playstation VR 2016 press kit'.

[2] See for instance: *Immersed in Technology: Art and Virtual Environments*, ed. by Mary Ann Moser and Douglas MacLeod (Cambridge, MA: MIT Press, 1996); Jay David Bolter, Richard Grusin, *Remediation: Understanding New Media* (Cambridge, MA: MIT Press, 1999); *Immersed in Media: Telepresence Theory, Measurement & Technology*, ed. by Matthew Lombard and others (Cham: Springer, 2015); *Immersion in the Visual Arts and Media*, ed. by Fabienne Liptay and Burcu Dogramaci (Leiden, NL: Koninklijke Brill, 2016).

[3] Cited in Vittorio Gallese, Michele Guerra, *Lo schermo empatico. Cinema e neuroscienze* (Milano: Cortina, 2015), p. 280.

existences; since for him, cinema was incapable of providing an effective first person experience, precisely because of its two-dimensionality, being — literally — too *limited* by the permanence of the edges of the screen:

> My intention was to experiment with VR technology to explore the human condition in an attempt to break the dictatorship of the frame, within which things are just observed, and claim the space to allow the visitor to go through a direct experience walking in the immigrants' feet, under their skin, and into their hearts.[4]

The possibility of trespassing the threshold between image and reality is a *topos* that can be traced back over the ages within the history of art, since the famous story of the Greek painter Zeuxis, who is said to have painted such a realistic bunch of grapes that birds flew down to peck at it,[5] but it also inspires multifarious contemporary artistic research, epitomized by Jeffrey Shaw's famous poetic statement, describing his own work as a discourse 'with the cinematic image, and with the possibility to violate the boundary of the cinematic frame — to allow the image to physically burst out towards the viewer, or allow the viewer to virtually enter the image'.[6] The advent of a dissolution of the frame boundaries is pushed even further by art historian, critic and scientific and artistic director of Fondazione Prada Germano Celant, for whom the virtual interface involves the possibility not just to communicate but to incorporate and to coincide with the experience of the other:

> With *Carne y Arena*, Iñárritu turns the exchange between vision and experience into a process of osmosis in which the duality between the organic body and the artificial body is dissolved. A fusion of identities arises: a psychophysical unity in which, by crossing the threshold of the virtual, the human strays into the imaginary and vice versa. It is a revolution in communication in which seeing is transformed into feeling and into a physical engagement with cinema: a transition from the screen to the gaze of the human being, with a total immersion of the senses.[7]

In a way, the new accessibility of virtual reality's 'unframed' space would entail the end of editing and *mise en scène* as they have been implemented since their appearance just over a century ago; indeed, the spectator is no longer subject to the segregation of the limits of the image and to the constraints imposed by cinematic and digital screens, thus inaugurating new forms of multimodal and immersive experience: 'While both are audio-visual, VR is all that cinema is not,

[4] '*Carne y Arena* (2017) press kit', Fondazione Prada, Milano.
[5] See Pliny, *Nat. Hist*. 35, 65. On this topic see also Andrea Pinotti, 'The Painter through the Fourth Wall of China: Benjamin and the Threshold of the Image', in *Benjamin-Studien 3*, ed. by Sigrid Weigel and Daniel Weidner (Munich: Fink, 2014), pp. 133–49.
[6] Jeffrey Shaw, discussion with Ueno Toshiya: 'We are Materialists, We Employ Science and Technology to Concretize the Virtual', in *Media Passage: InterCommunication '93: Agnes Hegedüs, Matt Mullican, Jeffrey Shaw*, ed. by Akihiko Yoshimura (Tokyo: NTT, 1993), p. 53.
[7] '*Carne y Arena* (2017) press kit'.

and vice versa; the frame is gone and the two-dimensional limits are dissolved… During this realistically unreal experience, our brain wires and most of our senses are tested'.[8]

Furthermore, the idea of a progressive convergence or even of a fusion between the beholder and the spectacle underpins a large part of recent VR contents deeply concerned with humanitarian, social and gender issues.[9] Virtual reality appears to be the 'ultimate empathy machine'. First advanced by VR cinema director and producer Chris Milk — pioneer in the creation of 360° films like *Clouds Over Sidra* (2015) et *Waves of Grace* (2015), realized in collaboration with the United Nations — in his famous 2015 TEDtalk,[10] this definition has become a *cliché* in the field of VR content industry. Milk maintained that virtual reality offers the most powerful tool for incorporating the perception of the other, or actually being another (an objective that is pursued by VR projects, such as BeAnotherLab[11] and their 'machine to be another', designed to measure the empathic response generated in the users through immersive experience). Hence, head-mounted displays and VR interfaces should not be understood simply as an artistic medium, but as an alternative mode of human consciousness, capable of changing minds as it allows to live the virtual as real.

The claim of empathy plays a dominant role in the discourse that revolves around the prospects of virtual reality, although it has been rejected by artists and directors experimenting with VR technologies or at least discussed from a more problem-raising perspective, as for instance by the creator of immersive journalism Nonny de la Peña, or by Kathryn Bigelow and Imraan Ismail, directors of the VR film *The Protectors* (2017) — whose subtitle, *Walk in the Ranger's Shoes*,[12] insists on the stakes of the debate we have just outlined.

Nevertheless, if we further examine the rhetoric of total immersion going hand in hand with the 'empathy machine' *cliché*, we realize that such an assumption informs and underpins the collective discourse and storytelling strategies through

[8] Ibidem.

[9] On this topic see the NECS Conference 2017 panel 'Virtual Reality and Cinema: Environments, Experiences, Narrations', with Luca Acquarelli, Matteo Treleani, Marcello Vitali Rosati and Francesco Zucconi, in particular Zucconi's talk: 'About the Limits of the "Humanitarian Virtual Experience"'.

[10] See Chris Milk's *TEDtalk* <https://www.ted.com/talks/chris_milk_how_virtual_reality_can_create_the_ultimate_empathy_machine?language=en> [accessed 28 January 2019]). About the 'empathy machine' construct, see Joshua A. Fisher, 'Empathic Actualities: Toward a Taxonomy of Empathy in Virtual Reality', in *Interactive Storytelling*, ed. by Nuno Nunes, Ian Oakley and Valentina Nisi (Cham: Springer, 2017); Grant Bollmer, 'Empathy machines', in *Media International Australia*, 165.1 (2017), 63–76 <https://doi.org/10.1177/1329878X17726794> [accessed 28 January 2019].

[11] See http://www.themachinetobeanother.org. About these experiences and installations see Alice Lenay, 'Puis-je fondre mon visage dans le tien ? Corps-à-corps au casque de réalité virtuelle', *Archée*, december 2018.

[12] Adi Robertson, 'VR was sold as an "empathy machine" — but some artists are getting sick of it', *The Verge*, 3 May 2018 <https://www.theverge.com/2017/5/3/15524404/tribeca-film-festival-2017-vr-empathy-machine-backlash> [accessed 28 January 2019].

which VR contents and devices are presented, more than it can describe the actual experience made possible by virtual environments.

In the present article, I will develop two main arguments about virtual reality experience, aiming to 1) undo the 'empathy machine' claim, and 2) discuss the assumption that in immersive environment the spectator faces a *frameless* visual field:

1) Through an analysis of Iñárritu's *Carne y Arena* installation,[13] I intend to show that the great potential of VR creations relies on the possibility of experiencing a fundamental *gap* or interval, as much as on the intensity of the feeling of presence they convey. In fact, it should be noted that what is supposed to be — according to the rhetoric of total immersion — an hermetically sealed and seamless reality, on the contrary, is pierced by a number of discontinuities in perception, depending both on narrative and environment design, and on the technical conditions of VR interfaces and devices. As a matter of fact, in virtual environments the experiencer faces the continuous emergence of a fundamental discrepancy between the virtual visible world and the physical presence of her own living body, exemplified by the fact that, while wearing a head-mounted VR device, the experiencer is not able to see her body parts but, only if the interfaces allow it, those of her avatar.

It is likely that in the near future the rushing development of VR interfaces will afford us an ever more fluid experience of immersive environments. Regardless, going against the grain of the mainstream discourse about virtual reality, I shall argue that, far from being a flaw to be overcome by technological enhancement — by a progressive miniaturization or prosthetic incorporation of technical devices —, *the experience of such a gap is one of the most promising and outstanding aspects of VR experience*, whose sense-making potentialities, so far largely neglected, have only begun to be explored, theoretically and practically, especially by contemporary artworks, in which virtual reality is establishing itself as the forefront medium for creative expression.

2) Furthermore, through this analysis, I aim to turn around the general idea that

[13] I have been able to visit and experience A.G. Iñárritu's *Carne y Arena* at the Fondazione Prada in Milan in Summer 2017. Despite virtual reality being increasingly popular in thematic festivals and arcades, *Carne y Arena* has been one of the very first VR works to be accessible for an extended period of time (7 June 2017 – 15 January 2018), continually and in the same location. This meant that for the first time it was possible to discuss with colleagues and friends the 'same' VR experience, just as we usually do with films, although the stories told by the experiencers seemed to differ a lot. This was due not just, as one might think, to the variability of the interactive environment explored, but mostly because — for a number of reasons I cannot indulge in here — the experience was remembered and told quite differently from the way one is used to describe a film plot or even a real life experience, resembling more the way one tries to recall a dream while telling it, overwriting and transforming its content through the prism of language and previous experience. I would like to thank those with whom I have been able to discuss this unique experience — like among initiates — for having shared their impressions and insights with me, especially Andrea Pinotti, Giacomo Mercuriali, Pietro Conte, Federica Cavaletti, Mauro Carbone, Pietro Montani, and Lorenzo De Cani.

in virtual environments the visual field is frameless or, to take Iñárritu's words, set free from the 'dictatorship of the frame'. Indeed, although virtual environments allow the spectator-experiencer to access a 360° tridimensional space, the human visual apparatus will always determine a cut into a potentially unlimited visual field, revealing only a portion of the visible at a time — or, in phenomenological terms, through successive impressions or in Husserl's phenomenological terms *profiles* or *off-shadings* (*Abschattungen*).[14] Therefore, to understand the viewer's experience in virtual reality, we need to focus on the constant discontinuity and aberration brought about by the very movement of the gaze as much as on its immersive aspects. In Henri Maldiney's words, we need to 'give back to the gaze what makes it a gaze', that is, 'its marginal field and horizon'.[15]

Thus, the hypothesis I intend to develop is that, if in virtual reality the frame of the image,[16] understood as the historical construct since Renaissance Art, seems to disappear, then the very function of *framing*, understood as the mobile limit operating an ontological cut in the visible and sensible world of the viewer, does not dissolve, but, rather, is carried out by the experiencer's body and embodied gaze.[17]

Bodies at the Edges. Virtually Present, Physically Invisible

Virtual environments do not just provide the experiencer with multiple scenarios to be put into action, but more significantly they give the possibility to create perceptual shifts, counter-act habitual perceptions and conventions, and even to redirect the attention to the awareness of one's own embodiment. [18] This is the case of Charlotte Davies' pioneering piece *Osmose* (Musée d'art de Montreal, 1995),[19] a VR creation that has become iconic for the way it diverts and displaces the imaginary of immersive experience at the very beginning of virtual reality technologies and implementations. In contrast to the visual

[14] Edmund Husserl, *Ideas I: Ideas for a Pure Phenomenology and Phenomenological Philosophy*, trans. by Daniel O. Dahlstrom (Indianapolis, IN: Hackett, 2014).
[15] Henri Maldiney, *Art et existence* (Paris: Klincksieck, 2003), p. 28 (my translation).
[16] About the aesthetic, epistemological and anthropological implications of the dispositive of the frame, see: Louise Charbonnier, *Cadre et regard. Généalogie d'un dispositive* (Paris: L'Harmattan, 2007); *Cadre, seuil, limite. La question de la frontière dans la théorie de l'art*, ed. by Thierry Lenain and Rudolf Steinmetz (Bruxelles: La Lettre volée, 2011); *La cornice. Storie, teorie, testi*, ed. by Daniela Ferrari and Andrea Pinotti (Milano: Johan & Levi, 2018).
[17] For an interpretation of the cinematic experience in its inseparable connection with embodied spatiality and human bodily gestures see Barbara Grespi, *Il cinema come gesto. Incorporare le immagini, pensare il medium* (Bergamo: Aracne, 2017).
[18] Mark B.N. Hansen, *Bodies in Code: Interfaces with Digital Media* (New York: Routledge, 2006) and *New Philosophy for New Media* (Cambridge, MA: MIT Press, 2004).
[19] Oliver Grau, *Virtual Art: From Illusion to Immersion* (Cambridge, MA: MIT Press, 2003), pp. 193–204, 207–11; Hansen, pp. 107–37; Laurie McRobert, *Char Davies' Immersive Virtual Art and the Essence of Spatiality* (Toronto: University of Toronto Press, 2007).

hegemony of photorealism, which was the mainstream tendency in graphic design at the time and is still largely dominant nowadays, the Canadian artist outlined a minimal and symbolic environment, whose aesthetic features were visually characterized by a certain emergence of the code. In particular, instead of implementing manual commands, the virtual interface was — surprisingly — controlled through the user's respiration and equilibrium system. By training the user's body with alternative orientation and motor coordinates in exploring a virtual tridimensional space, *Osmose* aimed at undoing our pre-comprehension of space, generally based on the assumptions of Cartesian-Newtonian physics, to transcend the 'traditional interface boundaries between machine and human', while re-affirming our corporeality.[20]

A more recent work, stemming from the new wave of VR creations that in the last years have been characterized by the implementation of head-mounted displays,[21] which take on what we can call a *poetics of the gap*, is Hayoun Kwon's *The Bird Lady* (Winner of the *Prix Découverte des Amis du Palais de Tokyo* 2015). The installation conceived by the Korean artist gives access to the imaginary world of a mysterious woman, drawn up by recollections of a former drawing teacher of the artist. Through an overlapping of collective and individual memory, the work plays on the confusion between real memories and dreams, between documentality and fantasy, precisely by building on the possibility of desynchronized effects and on the non-coincidence between the environment that unfolds — visually — to the viewer and the concrete space she is called to — physically — explore, while being immersed in the VR experience.

Far from deliberately diverting the interface provided by virtual environments, Iñárritu's *Carne y Arena* is rooted in a different and somehow more classic tradition. Drawing on the director's experience in mainstream narrative cinema more than in contemporary art, the installation seeks to provide the experiencer with a fluid immersive experience, not only by virtue of its hermetically sealed audio-visual tridimensional environment, but also through an engaging storytelling structure.[22] However, as I will suggest, *Carne y Arena*'s outstanding immersivity and engaging scenario surreptitiously prepare the ground in which the experiencer can be brought to sink into the striking experience of a perceptive gap.

In order to understand this process, let us first examine what falls apparently *out of the frame* of the artwork, that is, the two sections that, respectively, precede and follow the immersive VR experience. This *parergon* is by no means incidental and must be considered as part and parcel of the installation, essential for

[20] See Char Davies' site: <http://www.immersence.com/> [accessed 28 January 2019].
[21] About virtual reality since the implementation of head mounted displays see: Philippe Fuchs, *Théorie de la réalité virtuelle: Les véritables usages* (Paris: Transvalor–Presses des mines, 2018); *La realtà virtuale. Dispositivi, estetiche, immagini*, ed. by Cristiano Dalpozzo, Federica Negri and Arianna Novaga, (Milano: Mimesis, 2018).
[22] See John Bucher, *Storytelling for Virtual Reality: Methods and Principles of Crafting Immersive Narratives* (New York: Routledge, 2018).

delineating the experience designed by Iñárritu, that results from the interaction of these three inseparable and reciprocally intertwining sections.

Being introduced into the space of the exhibition, the experiencer is asked to take off her shoes and socks and put them in a locker, to get into a cold grey room — similar to a holding cell or operating room, which is the reconstruction of a *hielera*[23] —, where there are piles of shoes and other objects onto the walls. A signboard explains that such personal items belonged to men and women who probably lost their lives trying to reach the US border; these objects have been found in the desert and collected by two artists as part of an art installation. In Western visual culture, this composition bears a powerful symbolic reference to the Shoah (evoking the image of the thousands of shoes found in the Auschwitz-Birkenau camp; fig. 1), but it also alludes to an Adamitic nudity and castration, such as when we dream of leaving our home in slippers, partially undressed, or barefoot. Without shoes, a human being is soon deprived of the status of Western urbanized citizen, insofar as sidewalks and paved roads still represent for many cultures the emblem of civilization and wealth. In the text of presentation placed at the entrance of the exhibition, Iñárritu warns the visitor: 'In the desert, once you take your shoes off you are fucked.' Thus, the Mexican director invites the experiencers of the installation to figuratively put themselves *in the shoes* of the migrants trying to cross the United States-Mexican border, with all the paradoxical criticality that this movement of *alteration* entails.[24]

Then, a red light in the grey room indicates that the visitor can go through the door to access the large dark room — maybe an allusion to the darkness of cinema? — where the exhibition's assistants help her to wear a rucksack and an Oculus Rift headset. As if to emphasize the desire to overcome the limits of the cinematic apparatus, the first sensation that is given to the experiencer is not an audio-visual one but a *tactile* one: the uncomfortable contact between the feet and the cold gravel that entirely covers the floor. Such a multimodal interface will be amplified during the experience by the interplay of temperature, air blowing, and low frequency vibrations.

Once the VR experience begins, the experiencer finds herself in the desert, in the dim light of dawn, surrounded by shrubs and plants of Joshua tree. Soon a group of migrants appears in the scene: exhausted men, women and

[23] United States immigration authorities routinely detain men, women, and children, including infants, in frigid holding cells, sometimes for days, when they are taken into custody at or near the US border with Mexico. Migrants and US Customs and Border Protection (CBP) agents alike commonly refer to these cells as *hieleras* ('freezers').

[24] About the notion of empathy and its articulation in aesthetic experience cf. *Empathie*, ed. by Alain Berthoz and Gérard Jorland (Paris: Odile Jacob, 2004); *Les Paradoxes de l'empathie*, ed. by Patricia Attigui and Alexis Cukier (Paris: CNRS, 2011); *Empathie et esthétique*, ed. by Alexandre Gefen and Bernard Vouilloux (Paris: Hermann, 2013); Andrea Pinotti, *Empathie. Histoire d'une idée de Platon au posthumain* (Paris: Vrin, 2016); Serge Tisseron, *Empathie et manipulations* (Paris: Albin Michel, 2017); Vittorio Gallese, Michele Guerra, 'L'empathie d'une machine', in *Des pouvoirs des* écrans, ed. by Jacopo Bodini, Mauro Carbone and Anna Caterina Dalmasso (Paris: Mimesis, 2018), pp. 153–70.

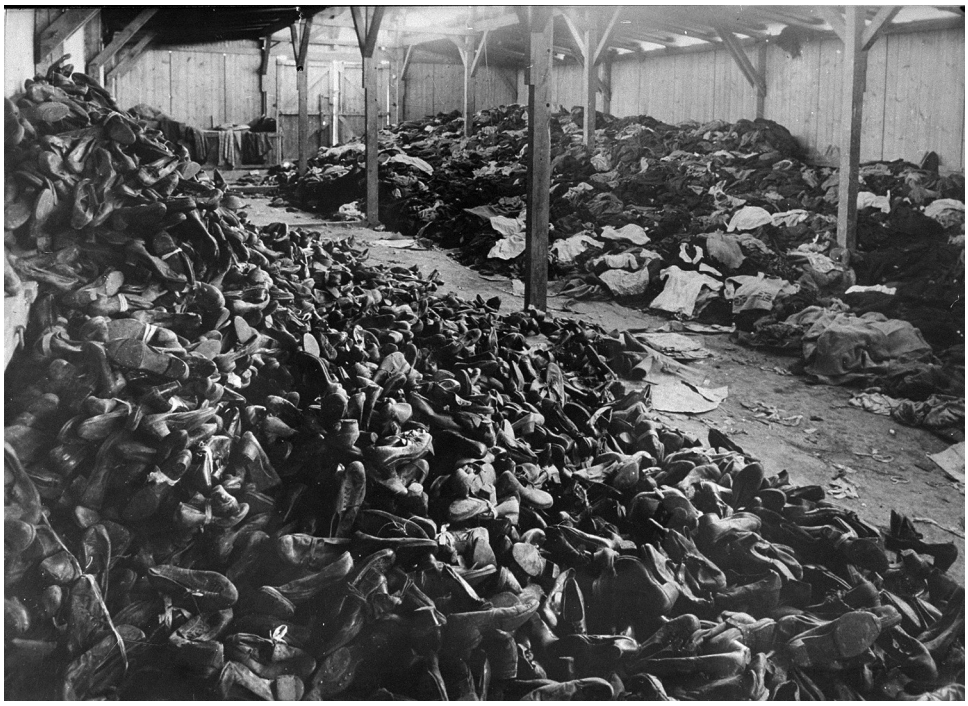

Fig. 1 Auschwitz-Birkenau, photography by the Soviet Army (Ukrainien Front)

children; among them, a woman has broken her ankle and is moaning for help in Spanish, a child is walking with his mother, a man tells people not to slow down… Instinctively, the experiencer will try to get close to the woman in pain, but, trying to approach the characters or to interact with them, she will soon realize that no one notices her presence. Like ghosts, the bodies of the characters pass through the body of the experiencer, or, rather, the experiencer acts like a ghost among them. Walking barefoot on the cool gravel that covers the room, the viewer starts to experience the contrast between the feeling of presence and 'being there' and the invisibility of her own body; in other words, between her tactile and proprioceptive sensations and visual perception.[25] She feels her own body, but she cannot see it.

Suddenly, the sound and wind of a helicopter — the movement of air being

[25] In his article 'Virtualmente presente, fisicamente invisibile. Immersività ed emersività nella realtà virtuale a partire da *Carne y Arena*' (*La realtà virtuale. Dispositivi, estetiche, immagini*, ed. by Cristiano Dalpozzo, Federica Negri and Arianna Novaga, (Milano: Mimesis, 2018), pp. 119–34, p. 128), Adriano D'Aloia suggests that tactile stimulations implemented in Iñárritu's VR installation can also induce potentially *emersive* effects. About immersive and emersive effect as regards video games experience see Piotr Kubinski, 'Immersion vs. emersive effects in videogames', in *Engaging with Videogames: Play, Theory, and Practice*, ed. by Dawn Stobbart and Monica Evans (Oxford: Inter-Disciplinary Press, 2014), pp. 133–41.

produced by a wind machine — bursts onto the scene appearing overhead, its spotlight bearing down. By means of very deep basses the ground starts to tremble. Soon the migrants and the spectator are reached by two SUVs of the American Border Patrol. The police officers with guns and dogs order everyone to lay down on the ground, while some of the migrants escape or hide into the scrub. It is chaos. People are screaming, a man trying to escape — probably a *coyote*[26] — is shot by the police. From a condition of complete passivity and helplessness, the experiencer observes these men and women treated like criminals, forced to take off their shoes and lay on the ground, while the flesh and the sand — *carne y arena* — mingle together.

Facing the violence of the scene, and being unable to help the migrants or to be treated like them, the experiencer senses increasing discomfort and awkwardness, as she perceptively realizes that, despite being right in the middle of the spectacle, she is in fact an invisible viewer. Her looking eyes are no longer those of a fleshy body, but of body one can look through, as if her whole body had transformed into a phantom limb. As it becomes invisible, the surface of the experiencer's body is then displaced, and the viewer faces a non-coincidence between her own *body image* and her motor and proprioceptive system.[27] Deprived of her visible flesh, she is unable to act within the environment, and she realises that she is in fact 'virtually present', but 'physically invisible', as the subtitle of the installation suggests.[28] As the action carries on around her, the experiencer is progressively led to acknowledge that the passivity imposed to her body, which is 'amplified by the specific *aisthesis* implemented by the installation', is nonetheless a 'structural element of the machinery',[29] that alone could allow the viewer to participate, in her way, in the migrants' existential condition.

[26] *Coyote* designates the smugglers who illegally transport or lead migrants through the border in exchange for large sums of money.

[27] Maurice Merleau-Ponty, *Phenomenology of Perception*, trans. by Colin Smith (London: Routledge, 2005). About the distinction between body image and body schema see Shaun Gallagher, 'Body Schema and Intentionality', in *The Body and the Self*, ed. by Jose Louis Bermudez and others (Cambridge, MA: MIT Press, 1995) and Shaun Gallagher, Jonathan Cole, 'Body Image and Body Schema in a Deafferented Subject', in *The Journal of Mind and Behavior*, 16.4 (1995), 369–90; systematically discussed as regards Merleau-Ponty's work also by Emmanuel de Saint Aubert, in *Être et chair. Du corps au désir: l'habilitation ontologique de la chair* (Paris: Vrin, 2013), showing that Merleau-Ponty makes no essential distinction between body image and body schema.

[28] For an analysis of the experience of *Carne y Arena* and especially for an interpretation of the meaning of the subtitle of the installation 'Virtually present, physically invisible', see also Andrea Pinotti, 'Immagini che negano se stesse. Verso un'an-iconologia', in *Ambienti mediali*, ed. by Pietro Montani, Dario Cecchi and Martino Feyles (Milano: Meltemi, 2018), pp. 232-33; Ruggero Eugeni, 'Les Médias immersifs, une question de présence', *The Conversation*, April 2018; Adriano D'Aloia, 'Virtual reality immersion and emersion in Alejandro González Iñárritu's *Carne y Arena*', *Senses of Cinema*, 87 (June 2018).

[29] '[Il visitatore prende atto che] quella passività è un elemento strutturale della macchina spettacolare complessiva ed è in ultima analisi l'unico modo davvero sensate di partecipare all'esperienza reale del piccolo gruppo dei profughi, eforse, più generalmente, all'esperienza del'essere profugo in quanto condizione esistenziale', Pietro Montani, *Tre forme di creatività: tecnica, arte, politica* (Napoli: Cronopio, 2017), p. 135.

The perceptive gap she senses overlaps with the social and cultural gap that prevents any Western, wealthy, welfare citizen, and passport-holder Museum visitor to completely coincide with the migrants' experience, with their existence *on the edge* and their bodies *at the edges*. Whereas in other VR film productions concerned with social and humanitarian issues, the viewing subject can still adopt a voyeuristic attitude which cinematic spectatorship has developed in the viewer, in *Carne y Arena*, the extraordinary immersivity of the environment makes — by contrast — the distance imposed by the interface more dramatic and almost unbearable for the viewer. Through this distancing effect,[30] the rhetoric of empathy is pierced, as the experiencer, far from being immersed in an 'alternative' and 'seamless' reality, actually digs herself deeper in this gap, from which springs the most outstanding aspect of Iñárritu's VR work, even going against the intentions declared by the director.

If, as Merleau-Ponty pointed out, the viewer is always a visible viewing, namely part of the visible world,[31] *Carne y Arena*'s specific interface forces the spectator into an impossible body, making her an impossible viewer. In fact, in Iñárritu's installation, the visibility of the body is pushed at its edges, so that the spectator experiences the boundaries of her own body and faces the impossibility of the specific position she is called to assume. Hence, instead of emphasizing the participation in the migrants' condition, Iñárritu makes the experiencer to feel the failure of any ethical voluntarism, revealing a conception of empathy as intercorporeality,[32] to borrow again Merleau-Ponty's expression, i.e. empathy not just as a possible coincidence with the feeling of the other, but rooted in the common experience of our body and of its embodied *situation* within the *flesh of history*. According to the philosopher, the common experience of *being flesh* is deeply concerned with what he calls an *imminent reversibility* between our touching and being touched, viewing and being visible, thus implying the experience of a gap and non-coincidence — the viewer is always a constitutive part of the visible world, but never coincides with it — as fundamental to our bodily and embodied existence.[33]

Before resuming the analysis of Iñárritu's work, let us point out that the definition of 'virtually present' but 'physically invisible' is also a powerful reference to the bodies of the migrants themselves, as they are *politically* invisible,

[30] About the dialectics between immersion and distanciation in VR cinema, see Luca Acquarelli, 'L'esperienza dialettica del cinema VR: tra immersione e distanziazione', in *La realtà virtuale*, pp. 107–18.

[31] Maurice Merleau-Ponty, *The Visible and the Invisible*, trans. by Alphonso Lingis (Evanston, Illinois: Northwestern University Press, 1968).

[32] Maurice Merleau-Ponty, 'The Philosopher and his Shadow', in *Signs*, trans. and ed. by Richard C. McCleary (Evanston, IL: Northwestern University Press, 1964).

[33] For a discussion of Merleau-Ponty's notion of flesh see Mauro Carbone, *La Chair des images. Merleau-Ponty entre peinture et cinéma* (Paris: Vrin, 2011) and Mauro Carbone, David Michael Levin, *La carne e la voce. In dialogo tra estetica ed etica* (Milano: Mimesis, 2003); de Saint Aubert, *Être et chair. Du corps au désir*.

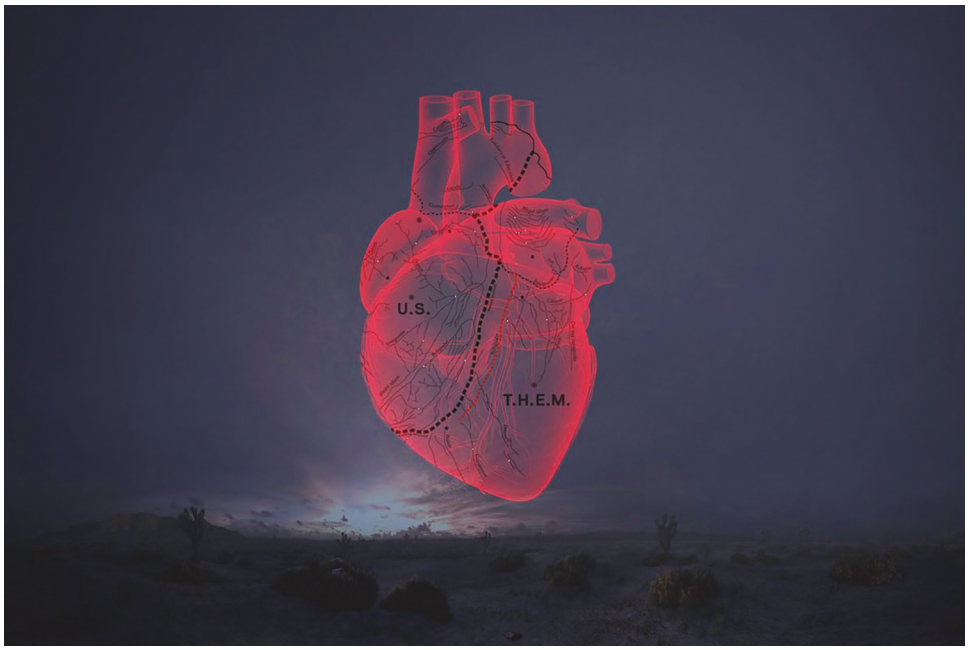

Fig. 2 *Carne y Arena* (2017) press kit, Fondazione Prada, Milan.

eluded or erased from the map of social space. The migrant's body is either left at the edges of the shared space of the community or screened, registered, and segregated, while — if we continue to outline the installation's topology — the western (metaphorically white) body, whose visibility is overexposed, medically and technologically enhanced, reveals to be invisible in its vulnerable materiality: despite being exhibited and manipulated, the white western body is often forgotten as flesh, often taken for granted, along with its rights, integrity, and whiteness. Such an invisibility is eminently expressed by Franz Fanon, when he affirms that while the black are always forerun by their blackness, the white always carry the colour of their skin behind their back.[34]

Thus, in *Carne y Arena* gaps and interruptions multiply, for the limits of the image and those of the body intertwine, and overlap with another kind of limits, those that are established by international borders, between U.S. and T.H.E.M., as expressed by the installation's poster (fig. 2). Indeed, Iñárritu's installation questions the limits of the body — its inner as well as its outer boundaries —, as they are inseparable from the biopolitical boundaries imposed by social and national borders.

This two-folded dimension of Iñárritu's work underpins an ontological condition. In the 'Introduction' to *Bodies That Matter*, Judith Butler pointed

[34] Frantz Fanon, *Peau noire, masques blancs* (Paris: Points, 2015).

out that, trying to make of the materiality of the body an object of thought, she invariably faced a resistance of the subject to be delimited within fixed boundaries. This is perhaps due to the fact that bodies themselves are always concerned by a 'movement beyond their own boundaries' and 'a movement of boundary itself'.[35] But, shall we not say the same for the image? Since, in *Carne y Arena*, the limits of the body and the geopolitical limits — always entailing the possibility of their transgression — also overlap with the problematic borders of the frame, and, as a result, the segregation imposed by the frame to the viewer's visual field significantly mirrors itself in the movement of segregation of the bodies in the geographical space.

Reframing Immersive Spectatorship

While the boundaries of the spectator's body are perceptively solicited, the construction of the VR experience is concerned by a further (quasi-cinematic) cut, when, suddenly, a bright light floods the scene, imposing a significant break in the continuity of the action, such that could be interpreted as indicating an ellipse or flashback in classic film editing. Gradually, in the immersive environment a vision appears: in the dusk, some of the people from the previous scene are sitting at a long table, the wounded woman is drinking some water, the child is fiddling with something, while someone else is singing a lullaby. Then, an undetermined object takes shape from the white surface of the table: it is a capsizing boat full of people, it sways into the waves, before sinking quietly.

After a few seconds, this strange digression closes abruptly, leaving the viewer in a state of uncertainty and suspense. Back at the heart of the action, an officer is aggressively interrogating a man, who is taken to be suspect because of his good knowledge of the English language. While the young man answers that this is due to his professional practice as a lawyer, the officer pursues his interrogation and bangs his head on the hood of the car. Spontaneously, led by the movement of the attention designed through the storytelling strategies, the experiencer tends to get closer to the live action, and, at this very moment, the officer finally turns around, stares back at her and shouts: 'and you, what do you want?'. Before she can even obey the police's orders, the officer points his weapon at her, but immediately everything dissolves into a bright whiteness. Then, for a few seconds, the desert, now empty, reappears, quiet and calm, and slowly the stereoscopic vision vanishes.

It is noteworthy that the immersive experience concludes with this *topos* — the breaking of the fourth wall by the policeman staring back and shooting at the audience — that in a way condenses the whole history of film, since this cinematic figure can be traced back to the famous shot of Edwin S. Porter's *The Great Train*

[35] Judith Butler, *Bodies That Matter: On the Discursive Limits of Sex* (London: Routledge, 1993), p. VII.

Fig. 3 *Carne y Arena*'s installation, Fondazione Prada, Milan (2017).

Robbery (1903),[36] a film that is considered as the very beginning of the western genre and the paradigm for the narration of classic Hollywood cinema, and that included this special effect proceeding from the so-called cinema of attractions.[37] Therefore, through this final allusive *punch line* and implicit quotation, Iñárritu seems to reconnect to the history of the moving image, with the powerful reference to the figure of direct address, and to affirm the continuity between his immersive realisation and the tradition of narrative cinema from which it springs, as much as it aims to break the boundaries of the frame and the bidimensional surface of the screen.[38]

At the exit of the dark room, the experiencer gets her shoes back and passes through a long corridor. One of the walls of the corridor is made by parts of the separation wall that was used along the US-Mexican border (fig. 3). The material presence of such a wall echoes the perceptive gap described above, as it separates the viewer from the space of the installation that lays beyond it, still visible through the holes in the sheet of metal, as much as from the experience of men and women she has encountered. At the end of the corridor, the experiencer finds another room — second *hors œuvre* that, as I suggested, has to be considered as

[36] In Porter's film, in a full-frame medium shot, the character leading the train robbers looks out of the screen and fires his gun straight at the viewing audience. The shot of the gun was the final shot of the film, or alternatively it was placed at the very beginning of the film to act as an attraction for the spectators.
[37] See Elena Dagrada, *The Great Train Robbery (Edwin S. Porter, 1903) e la storia del cinema* (Milano: Mimesis, 2011).
[38] About direct address in cinema see Tom Brown, *Breaking the Fourth Wall: Direct Address in the Cinema* (Edinburgh: Edinburgh University Press, 2012).

a part of the installation as a whole — in which small displays are arranged into as many niches. They show moving image-portraits of the people who lent their bodies to the VR creation, impersonating themselves and their own personal autobiographic experience. Through these small screens they finally stare back at the viewer. Some sentences, condensing fragments of their stories, appear superimposed on the faces in soft focus. They all come from different countries in Central and South America, some of them have attempted the trip several times, trying to escape dangers and desperate conditions or to reach their family members in the United States.

But another contrast is soon introduced, such that prevents the simple trajectory of empathy. One of the stories stands out in particular and usually draws the attention of the experiencer, revealing the problematic nature of any post-colonial voluntarism and the persistence of racist stereotypes: it is the statement of a middle-age Caucasian American officer. As reported by his testimony, while patrolling the border, this man encountered a group of migrants abandoned in the desert by a *coyote*. Despite his help and efforts, one of the men, already dramatically dehydrated, died in his arms. The presence of this white (male) character has a double-degree effect: first, by echoing the immersive scene the experiencer has just gone through, this story emphasizes the frustration and helplessness that she sensed with regards to the migrants' condition. Secondly, as a result, the experiencer — who can't help empathizing with the Caucasian officer, more than with the unimaginable experience of desperate migrants — slips back in the gap she has just experienced, that assumes a deeper anthropological significance, dramatically pointing at the obstacles in the process of decolonizing the Western gaze.[39]

This seems to me the icastic meaning that is embedded in the figure of the boat, that Iñárritu places at the very heart of the installation. This image, that has become the universal symbol of the international refugee crisis, was epitomized and exploited by many works in cinema and contemporary art in the last few years — from Gianfranco Rosi's *Fuocoammare* (2016) to Ai Weiwei's works and installations (figs 4 and 5) —, until it started to fade away and lose its meaning. But, more significantly for the trajectory of our reflection about immersive spectatorship, the boat also evokes a powerful metaphor in Western thought: that of the *shipwreck with spectator*, first outlined in Lucrece's *De rerum natura* and theorised by Hans Blumenberg's essay.[40]

Indeed, running counter to the distance and detachment that has defined aesthetic judgement after Kant, *Carne y Arena* puts the spectator within the spectacle and at the same time places her in an irreducible gap. Iñárritu's installation drives us into this gap, depriving us of our own visibility and flesh,

[39] On the difference between post-colonialism and decoloniality see Gurminder K. Bhambra 'Postcolonial and Decolonial Dialogues', *Postcolonial Studies*, 17.2 (2014), pp. 115–21.
[40] Hans Blumenberg, *Shipwreck with Spectator: Paradigm of a Metaphor for Existence* (Cambridge, MA: MIT Press, 1996).

Fig. 4 Ai Weiwei, *Libero*, Palazzo Strozzi, Florence (2016)

Fig. 5 Ai Weiwei, Installation *F Lotus*, Belvedere Museum, Wien (2016)

showing that we would never be able to completely conflate with the image, and revealing to which extent our visual field is crossed by discontinuities, unconscious lines, and invisible borders.

Thus, in the virtual environment designed by *Carne y Arena* the spectator does not experience a total and frameless immersion, if only for the fact that the space wherein one is allowed to move — in Iñárritu's just as in other VR installations — has limited boundaries. But, more significantly, the editing and framing have been working at every moment, enabled not just by the narrative interface, but also by the *performative response of the viewer*. In fact, if we follow Merleau-Ponty, the simplest perception is already a form of *expression*, perceiving is already a way of acting since it always entails the movement of the body, and, in other

words, since our perception *expresses* the world, recreating it.[41] Also, according to the enactive approach, drawing on phenomenology and cognitive science, and aiming to encompass an understanding of perception as fundamentally passive: 'Perception is not something that happens to us, or in us. It is something we do', since the world makes itself available to the perceiver through bodily conduct.[42]

Thus, in virtual reality, the experiencer can direct and point her gaze in a tridimensional surrounding environment, adopting different patterns of visual behaviour, tracing with her eyes what in film analysis would be called panoramic shots, travellings, changes of perspective, and so on.[43] As a result, the embodied gaze of the experiencer acts like a *virtual frame*, ensuring the functions of selection, comparison, association and dissociation, hitherto described in film theory as framing, camera movements and editing.

Hence, the experience of virtual environments forces us to think through embodied spectatorship, and to further explore the stakes of the debate developed by the phenomenology of film experience, which has significantly deepened the tactile and proprioceptive dimension of cinema in the last decades.[44] In a way, virtual reality brings us to face an *epistemological shift* in the conception of spectatorship, similar to the one that was brought forth in the history of cinema by the introduction of depth of field and long take or *plan-séquence*, which aroused a radical reassessment of the spectator's role, especially in the work of André Bazin.[45] Indeed, these aesthetic constructs and visual strategies, that

[41] See in particular Maurice Merleau-Ponty, *Le Monde sensible et le monde de l'expression: cours au Collège de France*, ed. by Emmanuel de Saint Aubert and Stephen Kristensen (Geneva: Metis Presses, 2011), as well as *Phenomenology of Perception*, 244. See also Raphaël Gély, *Les Usages de la perception. Réflexions merleau-pontiennes* (Louvain: Peeters, 2005).

[42] Alva Noë, *Action in Perception* (Cambridge, MA: MIT Press, 2004), p. 1; see also Francisco J. Varela, Evan Thompson, Eleanor Rosch, *The Embodied Mind: Cognitive Science and Human Experience* (Cambridge, MA: MIT Press, 1992).

[43] For a discussion of the redefinition of the experience of the intradiegetic spectator in VR cinema see D'Aloia, 'Virtualmente presente, fisicamente invisibile', p. 130.

[44] See for instance the seminal study of Vivian Sobchack, 'What My Fingers Knew: The Cinesthetic Subject, or Vision in the Flesh', in *Carnal Thoughts* (Berkeley: University of California Press, 2004), pp. 53–84; as well as Laura U. Marks, *The Skin of the Film: Intercultural Cinema, Embodiment, and the Senses* (Durham, NC: Duke University Press, 2000); and *Touch: Sensuous Theory And Multisensory Media* (Minneapolis: University of Minnesota Press, 2002); Jennifer M. Barker, *The Tactile Eye: Touch and the Cinematic Experience* (Berkeley: University of California Press: 2009).

[45] André Bazin, *What Is Cinema?*, 2 vols, ed. by Dudley Andrew, trans. by Hugh Gray (Berkeley: University of California Press, 2004), in particular 'The Evolution of the Language of Cinema', 'The Italian School of the Liberation', 'In Defense of Mixed Cinema', and 'William Wyler ou le janséniste de la mise en scène', not included by Gray in his selected two volume translation of Bazin's work. See also Dudley Andrew, *André Bazin* (Oxford: Oxford University Press, 2012); Michele Bertolini, 'Lo *spettatore attivo* di André Bazin: note sulla ricezione cinematografica', in *L'esperienza estetica*, ed. by Maddalena Mazzocut Mis (Milano: Mimesis, 2008). Otherwise, it is worth noting that the emancipation of the spectator, elaborated by Bazin, ultimately entails a problematically normative attitude, who led the French critic to privilege a cinema which lets appear an autonomous and self-emerging reality, able to elicit the spectator's creative response, whereas a cinema which implements a narrative and *sutured* editing would tend to inhibit a free interpretation of the image, by delivering to the beholder a sense already constructed. Under

took shape within the film as historical construction, obliged theorists to think of the spectator's experience not just as an essentially passive reception, but as constantly involved in an attribution of meaning and progressive readjustment of it, in which the interplay between the belief in the world represented and the reflection on such a reality results in an 'active' participation of the beholder.[46]

Otherwise, such a paradigm shift in the understanding of cinematic experience has been developed by Mikel Dufrenne in his essay 'Le Spect-acteur du film',[47] in which the French phenomenologist urges us to beware of the idea of the spectator as being completely absorbed and identified with the story and with camera movements, and outlines instead the active cognitive and aesthetic dimension which is key to the spectator's or, as he writes, the 'spect-actor"s experience.[48] Asserting that human visual experience always entails a fundamental hermeneutic activity, Dufrenne highlights how cinema always — even though this becomes evident only in experimental cinema — offers the possibility of a distancing effect and even a space for phenomenological reduction, allowing the spectator to operate choices as well as to reflect on her own perception by activating aesthetic judgment, which addresses not just the story, but the way it is told, that is, the way the camera works in order to reinvent it.[49]

Thus, contemporary virtual environments call for the theory of the 'active spectator' to be further developed by considering the fundamental connection and co-operation of activity and passivity, the latter being understood not simply as absence of action, but as a *latence* and as a form of embodied praxis, which is always implied by the act of looking.[50]

If, so far, it is the spectator's sensori-motor interaction, playfulness and transmedial agency which have been variously examined,[51] paradoxically it is

a philosophical angle, this perspective has been later investigated by Jacques Rancière in *Le Spectateur émancipé* (Paris: La Fabrique, 2008).

[46] About visual attention in virtual reality environments: Elena Hitzel, *Effects of Peripheral Vision on Eye Movements: A Virtual Reality Study on Gaze Allocation in Naturalistic Tasks* (Berlin: Springer, 2015); Shi Huang, 'A Method of Evaluating User Visual Attention to Moving Objects in Head Mounted Virtual Reality', in *Design, User Experience, and Usability: Theory and Practice*, ed. by Aaron Marcus and Wentao Wang (Cham: Springer, 2018).

[47] Mikel Dufrenne, 'Le Spect-acteur du film', in *Esthétique et philosophie* (Paris: Klincksieck, 1981), pp. 169–78.

[48] 'Si profondément immergé qu'il soit dans le spectacle, éprouve-t-il un certain sentiment de plaisir ou de déplaisir; et le jugement tient dans ce sentiment où déjà le sujet pointe. Mais il peut aussi s'affirmer plus explicitement en objectivant son jugement. Et il peut encore s'employer à le justifier: en quoi il adopte, avec plus ou moins de bonheur, l'attitude du critique', Dufrenne, pp. 174–75.

[49] Dufrenne, p. 175.

[50] For an analysis of this process as regards film experience see also Gallese and Guerra, *Lo schermo empatico*.

[51] Mel Slater, Martin Usoh, 'Body Centered Interaction in Immersive Virtual Environments', in *Artificial Life and Virtual Reality*, ed. by Nadia Magnenat-Thalmann and Daniel Thalmann (New York: Wiley, 1994), pp. 125–48; Ralph Schroeder, *The Social Life of Avatars: Presence and Interaction in Shared Virtual Environments* (London: Springer, 2002); Gordon Calleja, *In-Game: From Immersion to Incorporation* (Cambridge, MA: The MIT Press, 2011).

precisely the operationality and performativity of the embodied gaze that is still largely disregarded and needs to be examined, so as to shape a new vocabulary and conceptual tools to describe the spectator's experience of immersive environments. In fact, interactivity cannot be limited to the fact that the experiencer is now able to move,[52] respond and direct her actions towards certain goals within a virtual space, but brings as well into play new forms of voyeurism and narcissism, and more generally the implications regulating the gesture of seeing and being/not being seen. In this perspective the performativity of the gaze — the gaze working as a *virtual frame* — is inseparable from the agency or performativity of the image itself.[53] The etymological sense of *per-formativity* allows us to better outline the connection to the function of framing I am trying to outline. In fact, the term 'performance' is not related to 'form' — as one might think — if not by successive phonetic alteration; it comes instead from the ancient French 'par-fournir', from the proto-German '*frumjan', 'fram-' ('achieve', 'execute'),[54] the very same root for 'frame', the two terms ultimately referring to the sense of 'from' expressing 'movement away', which, with regard to the image, can be connected to the original movement of the figure-ground appearance.

Hence, if we try to outline how the living phenomenal body assumes the functions of the frame, this should not be understood in the sense that the practice of framing derives from the tradition of Modern representation, the *cornice* or *cadre* of the picture, external to the image, which descend from Renaissance theories of painting,[55] nor in the wake of the photographic and cinematic shot that cuts out a portion of the visible world, establishing an off-screen space. I will rather use the term *frame* to express that the spectator's embodied vision implements an eminently *figurative* structure — with reference to the figure-ground structure elicited by *Gestalt* Psychology[56] —, that participates by its very movement in the *information* and modulation of the visual experience of the image. Hence, the performativity of the virtual image describes a structure in which we can no longer assign categories of activity or passivity to one of the terms involved, that is the image and its experiencer, since they are in an imminent reversibility.[57]

[52] For a discussion of the notion of interactivity see Lev Manovich, *The Language of New Media* (Cambridge, MA: MIT Press, 2002), pp. 70–74.

[53] For an account of the performing power of images as regards traditional and contemporary picture theories see Chiara Cappelletto, 'The Performing Image, or How the Visual Dimension in Enacted by Pictures', in *Transvisuality: The Cultural Dimension of Visuality: Boundaries and Creative Openings*, ed. by Tore Kristensen, Anders Michelsen and Frauke Wiegand (Liverpool: Liverpool University Press, 2013), pp. 59–74.

[54] See *Dictionnaire du Moyen Français*: <https://apps.atilf.fr/lecteurFEW/lire/152/184> [accessed 28 January 2019].

[55] Leon Battista Alberti, *On Painting: A New Translation and Critical Edition* (Cambridge University Press: Cambridge, 2013).

[56] See for instance Kurt Koffka, *Principles of Gestalt Psychology* (London: Routledge, 1935).

[57] Merleau-Ponty, *The Visible and the Invisible*, p. 147.

Reviews / Comptes-rendus

Susan Murray
Bright Signals: A History of Color Television
Durham and London: Duke University Press, 2018, pp. 320

Belonging to what is probably the last generation growing up in households with both black and white and color television sets, I remember referring to the latter as 'the color TV', in order to distinguish it from the normal, monochrome 'TV'. Before long, of course, our domestic media typology has altered. The color TV became simply 'the TV', and the older model was now called 'the black and white TV' (shortly before it was delegated to serve as a monitor of the Commodore 64 computer). The fact of 'color' became absorbed in television as an unchallenged norm that needs not to be named. This transition in the very meaning of what television is appears conclusive and irreversible. Whereas the cinema, too, became predominantly a color medium long ago, black and white films are still routinely produced in various areas of the industry. Consider, for example, arthouse releases like *Roma* (Alfonso Cuarón, 2018) and *The White Ribbon* (Michael Haneke, 2009), indy films like *Frances Ha* (Noah Baumbach, 2012) and *Control* (Anton Corbijn, 2007), and even genre films like (most of) *Sin City* (Robert Rodriguez, Frank Miller, Quentin Tarantino, 2005) and the recent *Mad Max: Fury Road* (George Miller, 2015) rerelease. However, one is hard-pressed to come up with titles of recent television programs in black and white, outside occasional gimmicky one-off episodes or flashback sequences.

For this reason, it is striking to read in the very first sentence of Susan Murray's *Bright Signals* that in fact, 'Color television was a hard sell'. It was not only that the apparatus was technologically complex and costly. Murray's book painstakingly details how the television industry had to work through a wide range of material, institutional, and cultural hardships during the development and introduction of color broadcasting. Beyond the problems of adding visual information to the limited broadcasting frequencies and standardizing electronic representation of color across the industry, there was also a need to address the problems inherent in the subjectivity of perception and commonplace notions about the volatility of color. As the book argues, most significantly — and perhaps most elusively — the novelty of color television had to assume its place in mass culture as nothing short of a new, advanced way of seeing the world.

Bright Signals tells the history of color television's novelty period, focusing on the decades that preceded the commonplace application of color in American

television broadcasting in the 1960s. Color has been considered a part of televisual aesthetics from as early as the initial imaginaries of 'seeing at a distance' in the nineteenth century. However, while the first demonstrations of working prototypes of image transmission apparatus took place in the mid-1920s, color broadcasting remained an unfulfilled promise for several decades longer. The first chapters in the book offer detailed accounts of early experiments with electronic color reproduction technologies. As these chapters make clear, the technological capacity was only part of the difficulty of achieving color television, since conceptualizing the nature of televisual viewership appeared to be no less challenging. Murray couples the technological history with discussions of modern philosophical and physiological conceptions of the seeing of color and shows how they influenced the construction of color television. In one of the most fascinating sections of the book, Murray demonstrates how the initial efforts of the NTSC to standardize color practices effectively cast the historical debates about vision into mid-century technological design. The task the NTSC took upon itself was to investigate the nature of human vision in order to best adapt the transmission systems to it. More specifically, it drew on measurements of the psychophysics of perception in the pursuit of what would be a 'good enough' color image in relation to spectrum economy and signal compression.

At the same time, the book makes clear that color television never took the so-called natural conditions of vision as a reference point in a straightforward manner but was rather shaped in accordance to very particular cultural powers. For example, one of the main early challenges of color television systems was to achieve an acceptable reproduction of the color of skin-tone — and it was Caucasian tone (and in particular, the flesh tone of young white female models) that concerned the broadcasters' measurements. Even once color television was first commercially deployed in the 1950s, producers and advertisers needed to learn how to deploy color in different narrative and commercial frameworks. For them, it was essential that the sensory excess of color vision will be properly tamed so as not to break conventions of realistic screen representation.

Viewers too, (now framed as consumers rather than as viewing subjects) needed to learn not only how to adjust their new color sets, but also how to view color programs. In the second half of *Bright Signals*, Murray offers illuminating discussions of the first programs that introduced color to mass audience, the promotional campaigns that accompanied them, and the early deployment of color in international television services. Special attention is given to cultural documentaries that presented color as an improvement of the medium's verisimilitude and sense of 'liveness' and embedded it in a richer intermedial and artistic context. Lastly, Murray shows how by the late 1950s, in the eve of the mass dissemination of color sets, color programming acquired a new cultural meaning, becoming an index of 'naturally vibrant capitalist America' in the midst of cultural debates pertaining to the cold war and space age.

The book's most significant triumph lies in its historiographical and heuristic scope. Ostensibly, early color television appears to be a narrow aspect within the

history of the medium. But Murray's work relates color television to a range of cultural phenomena and discourses in a manner that continuously allows her to open up novel lines of inquiry. Tackling questions related to technological history, aesthetics, cultural studies, studies of marketing and design, media archaeology, and theories of spectatorship, the book posits the coming of color to television in the center of some of the most prevalent issues in media historiography today. Murray's characterization of the aesthetic function of early color television draws extensively on historiographic studies of early film color, particularly as she emphasizes the dialectics of realism and sensationalism in color moving images. However, more than applying such ideas to electronic media, *Bright Signals* also complements the historiography of color film (that typically focuses on the period of early cinema through the 1930s) by exploring the distinctive mid-century mass culture of consumerism and everyday modernist design. Furthermore, it highlights the unique nature of the formation of color television styles, which, unlike in cinema, often did not emerge out of open and anarchic experimentation but were rather products of complex process of standardization and the race for regulatory approval.

Reading the riveting examples that *Bright Signals* discusses, particularly in its late chapters on early color programming, I found myself at several points putting the book down to look up Murray's references on YouTube. Dedicating more space for close aesthetic analysis of selected scenes could be of benefit for readers interested in questions of televisual style and form. Similarly, I wish the book elaborated more on some non-entertainment deployments of televisual color (in medical or military fields, for example) which are mentioned only in passing. But it is clear that no book with such an ambitious purview can achieve everything in a single volume. The book's production and design also merit special mention — with over one hundred color images from television programs, advertisements, charts, test patterns and photographs, the book is, on top of everything else, a strikingly beautiful object.

Beyond being an extraordinarily researched and lively account of this key period in media history, *Bright Signals* also demonstrates the importance of further theorizing our relationship to colored moving images today. If at first blush we might think that the drama around the introduction of color television belongs to a bygone, naïve era, it quickly becomes evident that the cultural debates about the emotional effects of color are still present in our media environment today. Consider, for instance, the numerous reports about the phenomena of 'post *Avatar* depression', which some moviegoers have allegedly experienced after watching James Cameron's lushly colored 3D blockbuster. As one viewer described it in a CNN report, 'When I woke up this morning after watching *Avatar* for the first time yesterday, the world seemed... gray'.[1] More recently, several advice columns have recommended readers to change their cellphone

[1] <http://edition.cnn.com/2010/SHOWBIZ/Movies/01/11/avatar.movie.blues/index.html> [accessed 28 January 2019].

display to greyscale, claiming that the sensation of the colorful screen is one of the factors that may cause cellphone addiction.[2] We are still learning how to live with color visual media, and *Bright Signals* is invaluable in advancing the understanding of the historical and theoretical issues at play.

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[2] <https://lifehacker.com/change-your-screen-to-grayscale-to-combat-phone-addicti-1795821843> [accessed 28 January 2019].

Noa Steimatsky
The Face on Film
New York: Oxford University Press, 2017, pp. 279

'A face is a face'. There is nothing simpler and nothing more abstract than this affirmation which, by attesting to the real, also declares its enigma. There is something irrefutable and obtuse at the same time in Nanà's statement in *Vivre sa vie* (Godard, 1962), an acknowledgement of the face as the pure evidence of a phenomenon, lacking any singular quality. Precisely this abstract 'givenness', this mute evidence, is indicative of something based on appearance: a surface that shows itself and asks to be looked at, that defines the *image* of the subject and its recognizable identity, therefore becoming similar to a mask. The face, in fact, is not only the distinctive trait of an individual, but also the key part of a performance: the *façade* of a socially adequate identity, which can be very different from the truth of the subject. The face's function lies precisely in this paradoxical tension between revelation and concealment, evidence and elusiveness, recognition and indecipherability: it is a familiar yet enigmatic figure, singular but totally common, seductive and mysterious, the quintessence of the human and of her expressive qualities but also the index of her transformations, of the change of the very idea of humanity, of which the face — as both sign and representation — is the most evident trace. The face is considered 'the soul of an individual' precisely because of this ambivalence, its being enigmatic but also transparent, readable.

The Face on Film, by Noa Steimatsky, is devoted precisely to this element's complexity. It is an elaborate, dense study — winner of the 2018 Limina Prize for Best International Film Studies Book — and it declares its subject immediately, in the title: the book is indeed focused on the pivotal role played by cinema in defining a new visibility and shape of the visage. Within a comprehensive discussion of this 'medium of subjectivity' and of its different depictions — addressing painting and portraits, scientific and fashion photography, Byzantine icons and masks, in all their different functions and historically-situated meanings — Steimatsky analyses the transformation in our way of looking at the human being, our ability to recognize her, to read and to reproduce her expressiveness through the moving image. Consistently with Visual Culture Studies, the author combines historical and anthropological approaches as well as languages and visual arts, with the aim of defining the configuration but also the mode of the

gaze. Photography and cinema mark an epistemological rupture in the way in which we represent and experience the human. The animated face, in particular, constitutes for Steimatsky a face-to-face between the image and the body, and especially the body of the viewer, who not only recognizes herself in the images but adheres to it, thus becoming the subject and the bearer of the gaze.

As the essential 'Ur-image', the face is connected to precise frameworks of visibility and recognition: by equating it to a *dispositif*, Steimatsky 'posits the face as a paradigmatic perceptual "disposition" — a flexible configuration of attitudes relations and discourses' (p. 3). More than 'just an image', therefore, the face on film is an aesthetic and perceptual category, which reveals the alienation of the modern subject from the self. Here this takes the form of an image that nonetheless refers to a wider technological prison, in which the very same cinematographic apparatus recomposes and disintegrates the human figure — but also her truth, which is forcefully or magically captured by the eye of the camera. The main issue is clearly addressed in the introduction:

> What is at stake, then, in assuming the face as *dispositif*, is not only a type of object nor a discrete metaphor, but a complex of figural functions and relations, open to expansion and, indeed, transfiguration. The face is, then, both a compelling iconographic and discursive nexus and a way of seeing, a critical lens, a mode of thought (p. 4).

Film theory of the 1920s, which is retraced in the first part of the volume, seizes this radical power of a visage that is opened up to a (kind of) vision. Steimatsky re-examines Epstein, Balázs, Eisenstein's 'intensive face' (p. 41) and Kuleshov's experiments in the light of readings by Mary Anne Doane, Jacques Aumont, Gilles Deleuze and Yuri Tsivian: this reconstruction is as inevitable as it is attentive, connecting the past and the present, and also testing all those theories with the transformed social and cultural scenario of today's cinema and images. Therefore, by way of example, *photogénie* is 'read as a precedent to the "contemporary schizophrenia of scale", also acknowledging its "subversive potentiality"' (p. 39); and Kuleshov's experiments as the harbinger of the surveillance techniques of disciplinary institutions.

Barthes and Bazin, furthermore, become the main references for a comparison of construction strategies of the face in Hollywood cinema — the seduction of the glamour, the mythical incarnation of the stars, the wholeness of meaning that it delivers, that crystalizes an ideal of the human face — and the anti-glamour of the anonymous 'man in general' (p. 74) of Neorealist cinema. This trust in the possibility of capturing humanity in a naked, innocent, naturally expressive face contrasts with the careful 'shaping' of Hollywood, a process that Steimatsky reads as a literal *masking*. Doing so, she refers to the studies on the mask and its anthropological and cultural values.

The most original contribution of the book lies in the analyses that constitute the second part of the volume. They are all important and insightful readings, especially those devoted to *The Wrong Man* (Hitchcock, 1956), and to screen tests — from two episodes by Antonioni, to Warhol's eponymous project.

These provide quintessential examples of the conditions in which the cinematic dispositif situates the subject, that thus becomes in some way the prisoner in a lab experiment. Both cases present the same mechanism of surrender of the subject to the apparatus, of subjugation within an image:

> *The Wrong Man* offers the most rigorous dramatization of the subjugation of the individual to social and institutional scrutiny, of the thread to identity and its self-alienation under the oppressive gaze of all such apparatuses. Finally, the workings of cinema itself are insinuated in these measures of defining and containing the *persons* (p. 151).

Among the several possible variations of the face, Steimatsky privileges two: the first is the face as a single and singular figure — the single face, alone — for which the isolation within the frame is already the evidence of attention and attraction, of privilege and distance; this prominence becomes the scene of excess and fascination. It is represented in the sensuous and glamorous faces of stars, where which seduction takes the place of revelation.

The second figure is the 'face-to-face', intended both as a comparison within the image, such as the shot/counter-shot, and as a relationship between the image and the spectator. In this mirror-image — a call that it is impossible to refuse — an echo reverberates of an ancient fascination for the quality of the face to combine intimacy and subjugation, which makes it the epitome of the cinema experience. The *vis à vis* represents also an encounter with the constraints of the mechanical eye of the cinema, with its powerful, controlling gaze. The reluctance, resistance to showing, thus become forms of protection and opposition — both of the subject and of a certain kind of cinema — to this identification apparatus. This oscillation between resistance and surrender, power and vulnerability, evidence and opacity convey the subject and her humanity. Beyond the mask, but within the image.

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Projects & Abstracts

Une émotion purement visuelle. Films scientifiques entre expérimentation et avant-garde, 1904-1930

Maria Ida Bernabei / Ph.D. Thesis Abstract[1]
Thèse en cotutelle : Università Iuav Venezia et Université Paris VIII

Paris, les Années Folles : entrer dans le Théâtre du Vieux-Colombier et y découvrir les films en *ultracinéma* de Lucien Bull, ou dans un Studio 28 tout juste inauguré et se plonger dans une cristallisation de sels minéraux projetée en triptyque. Encore, franchir le seuil de l'un des sièges de la Film-liga hollandaise et y trouver projetée une série de floraisons sensuelles, ou assister à la quatrième performance de la London Film Society, où un film radiographique en précède un sur les exploits de l'insecte le plus impi-toyable, le *dytique.*

Par sa systématique inclusion au sein de la programmation de salles spécialisées et ciné-clubs qui poussent nombreux tout au long de la deuxième moitié des années vingt dans les principales villes d'Europe, le film scientifique se trouve, dans ces années, à jouer un rôle déterminant dans la construction de l'avant-garde cinématographique. Notamment en raison des techniques spécifiques qu'il développe — ralenti, accéléré, microcinématographie et prises de vues sous-marines — il peut revendiquer sa propre place dans la réflexion sur la spécificité du médium, tout en catalysant la définition de quelques concepts fondamentaux des théories esthétiques de l'époque.

En particulier, on constatera que là où il y a eu de l'*avant-garde*, là il y avait aussi la présence tranquille mais constante du film scientifique, qui semble effectivement dénouer le dédale d'occurrences qui de ce mot glissant ont été données dans les années. On peut en fait trouver « les donnés du cinéma pur »[2] dans plusieurs documentaires scientifiques, et on sera en mesure d'identifier des *symphonies visuelles* dans la germination d'un grain de blé, ainsi que des *cinégraphies intégrales* dans le déroulement des formes géométriques d'une cristallisation. Pour quelqu'un, également, il n'y a le vrai *cinéma pur* que dans les films *ultra-rapides* de Lucien Bull et les cristallisations sont tout-à-fait des films *abstraits,* alors qu'il y a ceux qui lisent les microbes de Jan Cornelis Mol en tant qu'acteurs de films « presqu'absolus ».[3] Certains, enfin, n'hésitent pas non plus

[1] Directeurs de thèse Prof. Marco Bertozzi et Prof. Dominique Fournier-Willoughby. Pour plus d'information : midabernabei@gmail.com.
[2] Germaine Dulac, « Le Cinéma d'avant-garde » (1932), repris dans id., *Écrits sur le cinéma (1919-1937)*, ed. par Prosper Hillairet, Paris, Paris Expérimental, 1994, p. 186.
[3] Menno ter Braak, « Zevende voorstelling Programma » (1928), repris dans *Filmliga 1927-1931*, Nijmegen, SUN, 1982, p. 162.

à déclarer leur prédilection pour le documentaire scientifique en tant qu'objet *surréaliste.*

Pourquoi l'avant-garde est-elle si magnétiquement attirée par le film scientifique? Comment est-il possible que des films qui *ne sont pas de l'art*[4] soient entrés, de façon programmatique, dans son horizon esthétique ?

Dans la thèse j'ai essayé une réponse à cette question, en commençant tout d'abord par une limite : celle qui lie l'oeil des scientifiques pionniers travaillant au tournant du siècle au développement du cinéma scientifique, et l'oeil des années vingt. De même que le premier était diminué par le joug de ses propres limites — le travail d'Étienne-Jules Marey, une bataille pour « corriger l'imperfection de notre œil », celui de Jean Comandon pour dépasser les « difficultés que nous avons dans l'acte du voir »[5] — l'oeil des années vingt — celui qui théorise le cinéma et qui combat pour son affirmation — est borgne, distrait, lent et peu performant. Et de même que les scientifiques ont mené des années de recherche pour trouver des appareils qui neutralisent cette limite, l'oeil des années vingt – cette « vue défectueuse », assujettie à ses « limites étroites »[6] — découvre en photographie et cinéma des alliées puissantes et prothétiques, capables de transformer radicalement l'expérience de la vision en une *nouvelle vision.* C'est pourquoi Germaine Dulac considère le cinéma en tant qu'un « œil grand ouvert sur la vie, œil plus puissant que le nôtre et qui voit ce que nous ne voyons pas ».[7]

Dans ces pages je propose justement une "taxinomie de la révélation" à travers laquelle l'objectif cinématographique, potentialisé par les techniques scientifiques, révèle aux avant-gardes les multiples occurrences de ce que Walter Benjamin appellera dans ces mêmes années l'*inconscient optique*. Cette taxinomie suit deux axes, dont le premier est dédié au Janus constitué du ralenti et de l'accéléré, techniques qui foudroient l'avant-garde en raison de leur capacité à modifier la temporalité en travaillant sur la cadence variable de l'échantillonnage et de la reproduction des photogrammes; outils d'une *machine à remonter le temps* — le cinéma — qui justement grâce à leur action combinée s'avère en tant que « oeil nouveau » dont le « monde nouveau que l'esprit du siècle a découvert » a besoin.[8]

De quelle façon le ralenti influence-t-il les théories esthétiques des années vingt? Généré par une étincelle électrique de l'incroyable puissance *photogénique*,

[4] La référence est à James Elkins, « Art history and images that are not art », *The Art Bulletin*, vol. 77, n° 4, décembre 1995, pp. 553–571.

[5] Étienne-Jules Marey, *La méthode graphique dans les sciences expérimentales et principalement en physiologie et en médecine*, Paris, 1878, p. XVII et Jean Comandon, « Cinématographie de microbes », *Dossier de la Société d'Encouragement pour l'industrie nationale*, Fonds Jean Comandon, Bibliothèque Nationale de France, carton JC41.

[6] Lászlo Moholy-Nagy, *Painting, photography, film* (1925), tr. eng par Janet Seligman, London, Lund Humphries, 1987, p. 7, trad. de l'auteur.

[7] Germaine Dulac, « L'essence du cinéma – L'idée visuelle » (1925), repris dans id., *Écrits sur le cinéma (1919-1937)*, op. cit., p. 65.

[8] Jean Tedesco, « Études de ralenti », *Cinéa-Ciné pour tous*, n° 57, 15 mars 1926, p. 12.

comment *L'Éclatement d'une bulle de savon* de Lucien Bull arrive-t-il à être conçu en tant que le « seul film presque *pur* existant actuellement »?[9] Comment les « meilleurs mensonges » peuvent rester « sans force », une fois analysées par cette technique ?[10] Comment, enfin, sa capacité de rendre visible l'*invisible* devient-elle progressivement la capacité de rendre saisissable l'*insaisissable* ?[11]

De la même manière, comment l'accéléré — technique à fort potentiel d'animisme, à travers laquelle l'avant-garde découvre les *rythmes* de la nature — met en lumière des *Problèmes de photogénie*?[12] Pourquoi un *Kulturfilm* comme *Das Blumenwunder* (*Le miracle des fleurs*, 1926) va-t-il être projeté au Bauhaus? Pourquoi des films sur la formation des cristaux ou sur l'embryogenèse d'un oursin se révèlent être des « films documentaires et, surtout, film d'avant-garde »?[13] Enfin, pourquoi la croissance d'un grain de blé détient-elle les clés de « l'*émotion purement visuelle* ».[14]

Les univers à temporalités variées esquissés par ralenti et accéléré vont de pair avec le deuxième axe taxinomique, qui traite du rapprochement aux corps, de leur filature, de leur pénétration et est dédié au film *animalier*, à la micro et radiocinématographie. Sur les pages de l'avant-garde et dans ses clubs, habitent en fait les bêtes protagonistes des films animaliers les plus variés, absorbées dans leurs activités, marquées par des caractères leurs propres, racontées par l'objectif réglable de la caméra. *Animaux Photogéniques*, dont les faces vont être juxtaposées, au Vieux-Colombier, aux *Sélections d'expressions* de grands acteurs.

Dans le milieu moderniste il ne suffit cependant pas de se rapprocher à un corps, qu'il soit animal ou humain. Il faut davantage y rentrer dedans, franchir les limites de la « sensibilité rétinienne »[15] grâce à un regard « sans frontières ni distances »[16] qui arrive à témoigner des faits effrénés se déroulant en dessous de nos tissus, ancrés à nos os, ou des grands événements ayant lieu dans l'infiniment petit caché en nous, dans l'eau que nous buvons, dans les feuilles des plantes de notre jardin. Par le biais des agrandissements réglables de la microcinématographie, l'avant-garde va découvrir la loi universelle qui amène les cellules de notre sang à faire face, courageuses, à tout envahisseur, et les cristaux à pousser comme des plantes ; elle va récupérer des anciens *topoi* de la défamiliarisation, en les revisitant dans le cadre de la définition du nouveau langage cinématographique.

[9] Paul Ramain, « Sur le soi-disant "film pur" », *Cinéa-Ciné pour tous*, n° 128, 1 mars 1929, p. 8.
[10] Jean Epstein, « Photogénie de l'Impondérable » (1935), repris dans id., *Écrits sur le cinéma, 1921- 1953. Edition chronologique en deux volumes*, vol. 1, Paris, Seghers, 1974, p. 253.
[11] Cf. Germaine Dulac, « L'action de l'avant-garde cinématographique » (1931), repris dans id., *Écrits sur le cinéma*, op. cit., p. 158.
[12] Dimitri Kirsanoff, « Les problèmes de la photogénie », *Cinéa-Ciné pour tous*, n° 62, 1 juin 1926, p. 10.
[13] Germaine Dulac, « Aphorismes » (1925), repris dans id., *Écrits sur le cinéma*, op. cit., p. 60.
[14] Germaine Dulac, « Du sentiment à la ligne », *Schémas*, n° 1, février 1927, p. 29.
[15] Jean Tedesco, « Le Règne du Théâtre et la Dictature du Cinéma », *Cinéa-Ciné pour tous*, n° 74, 1 décembre 1926, p. 10.
[16] Dziga Vertov, « The birth of the Kino-Eye » (1924), repris dans id., *Kino-Eye*, ed. par Annette Michelson, Berkley, Los Angeles, London, University of California Press, 1984, p. 41.

Enfin, nous pourrons découvrir la manière dont le film scientifique, *re-semantisé* par le regard de l'avant-garde et *re-localisé* au sein du dispositif de programmation de ses ciné-clubs, revendique sa propre place dans le processus de réactivation de l'expérience de l'homme moderne qui fait l'objet de la réflexion de Walter Benjamin.

The forms of characters. Typologies, morphologies and relational systems in contemporary TV serial narrations

Sara Casoli / Ph.D Thesis Abstract[1]
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Fictional characters have demonstrated to be ubiquitous and proteian entities, and it's because of the semantic slipperiness of their essence that the importance and pivotal role of these narrative elements have been neglected for a long time. Even when taken into consideration and observed through the lens of this or that approach – from Aristotle to Romanticism, from Structuralism to Postmodernism, from Cognitive Theory to Narratologies, and so on – characters still remain a theoretical challenge and a knotty object of study[2] built on the balance of two faces, a textual construction expressed by a medium, and a "quasi-persona" existing in a diegetic space.

The vagueness of the concept concerns characters in every media product, and serial TV narratives are no exception. Nevertheless, in an era dominated by the aesthetic and productive paradigm of "complex television",[3] where characters fulfil a substantial role in shaping the aesthetic layout of contemporary TV series and influencing audience participation, we have to reflect upon them. The aim of this work is to investigate characters in contemporary drama TV series produced in the USA, with the purpose of unearthing their features and specificities, as well as proposing a typology of their manifestations. In order to achieve this goal, we will rely on a methodology that merges TV and Media Studies with Narratology. In fact, in the plethora of different attitudes through which it is possible to analyse fictional beings, Post-Classical Narratology appears to be a fruitful way in order to outline those processes that generate the identity of serial characters and their characterization. In this perspective, thanks to the momentum given by the latest contributions in Narratology[4] – which takes into account cultures and societies, as well as textual and aesthetic structures – it is possible to conceive characters as *both*

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[2] Jens Eder, Fotis Jannidis and Ralph Schneider, *Characters in Fictional Worlds. Understanding Imaginary Beings in Literature, Film, and Other Media* (New York and London: De Gruyter, 2010).
[3] Jason Mittell, *Complex TV. The Poetics of Contemporary Television Storytelling* (New York: New York University Press, 2010).
[4] *Narratologies: New Perspectives on Narrative Analysis*, ed. by David Herman (Columbus: Ohio State University Press, 1999); *Postclassical Narratology: Approaches and Analyses*, ed. by Jan Alber, Monika Fludernick (Columbus: Ohio State University Press, 2010).

textual constructions with certain features (mediality, textuality, narrative strategies, etc.) and contextual figures, namely considering how these fictional beings act, react and behave in the storyworld. Bearing in mind this intrinsic duplicity, a suitable methodology that takes both sides into account, offering a theoretical toolkit through which we examine TV series characters and their textual and contextual (aka cultural) components, is provided by a particular branch of Post-Classical Narratology: the Neo-Formalism.[5] This approach considers as a "form" every arrangement of elements, regardless of the fact that there are textual strategies, such as narrative and figurative features, aesthetic strategies and the medium, or contextual strategies, by which we mean socio-cultural themes and issues.

We propose to examine characters in contemporary TV serial narratives as they were composed, or better, *co-formed* by different forms, both textual and socio-cultural ones, clashing with one another. To put it in other terms, we consider these characters as battlefields, where many different textual and socio-cultural forms come into contact and collide, shaping the identity of these fictional beings on the textual level and their appearance on the diegetic one. The benefit of such approach relies on the possibility of decomposing these figures into their components and forms, observing the specifities beneath the conformation of their identity and the process of characterization.

Conducting a neo-formalist analysis on contemporary TV serial characters means taking into account two distinct but interconnected generative factors of serial characters identity and characterization. On the one hand, there is morphology, which implies those elements that "internally" affect the construction of characters, from the point of view of the aesthetic materials and that of the cultural functions. Basically, the identity of a character can be considered morphologically simple, with a stable kernel of traits repeated in every instalment, or complex, with some variations operating on the identity of the character. On the other hand, there is the relationship system, which involves the placement of the character in a narrative world with specific characteristics (type of seriality, transmediality, intertextuality, transtextuality,[6] etc.) and the network it creates with other fictional beings. Here again, the relational system can be simple, with one or few characters stably performing the role of protagonist(s) and existing in tendentially closed narratives, or it can be complex, where the plenitude of interconnected storylines, even not necessarily belonging to the same series or to same narrative world, produces a turnover of different protagonists. Looking at the many characters we can experience in nowadays TV serial narratives within the neo-formalist framework, and considering their morphology and relational system, it is possible to detect some "family resemblances"[7] between them, i.e.

[5] Caroline Levine, *Forms: Whole, Rhythm, Hierarchy, Network* (Princeton: Princeton University Press, 2015).
[6] Richard Saint-Gelais, *Fictions transfuges* (Paris: Edition du Seuil, 2011).
[7] Ludwig Wittgenstein, *Philosophical Investigations* (Malden and Oxford: Blackwell Publishing, 2001).

similar morphological assets and analogous ways to create relations with the narrative space and its cast of characters. When tracking these similarities, we group peculiar manifestations of serial characters into categories, thus creating a typology. Practically speaking, by crossing the two generative factors discussed above, in light of both their simplicity or complexity, we get four types of serial characters: the *stereotypical* character (both morphology and relational systems are simple), the *individualized* character (complex morphology and simple relational system), the *popular* character (simple morphology and complex relational system) and the *replicating* character (both the morphology and relational systems are complex).

Through this typology and the examination of the types composing it, we propose a "distant reading"[8] on serial characters. This view allows us to radiograph the ways they come into existence in the contemporary televisual scenario, and to consider the complexity and the manifold nature of these narrative elements as a general theoretical problem, instead of focalizing the analytical efforts on particular case studies.

[8] Franco Moretti*, La letteratura vista da lontano* (Torino: Einaudi, 2003) and *Distant Reading* (London and New York: Verso Books, 2013).

Portuguese cinema and Revolution (1974-1982)

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The Portuguese Revolution, known as the Carnation Revolution, started on 25 April 1974 and has also rolled out in cinematographic institutions and in the alternative production of films known as "intervention" films. Cooperatives are the basic structures of this cinematographic production, mostly revolving around documentaries. Filmmakers would get together in different cooperatives (Cinequipa, Cinequanon, Grupo Zero) through ties of friendships or because of political affinity, where they would share their skills and equipment. These cooperatives of filmmakers produced more than a hundred films and programs for both cinema and television, up until the end of the 1970s. Focusing on this short and liberating time of the recent Portuguese history, this work aims to establish that the idea of revolution, understood as a process, but also as an event and a rupture, has provoked a specific film production. The chronological area thus corresponds to the years of the Portuguese Revolution of 1974-1975 and its upheavals until 1982.

To grasp this singular moment in all its complexity, cinema and politics are analysed in their interplay with the balance of power existing between regime, institutions, and cinema world. The first part is dedicated to the history of the New Portuguese Cinema of the 1960s, highlighting both the existing dynamics between different generations of filmmakers and the roles played by the cinema industry and the State in the debates for a new legislation of Portuguese cinema. The process started in 1974, and thus appears both as a continuation – the power was somehow already taken by the filmmakers before 1974 – and as a rupture: films are different, and filmmakers choose various strategies. Conflicts and power issues track the urge for a revolutionary cinema able to follow the radical changes in society. Filmmakers would then question the possibilities of creation in that context: experiences of collective production, alternative distribution, and new practices of militant cinema are all examples of different ncreative opportunities

The study of various films, and the confrontation of cinema with the revolution, offer many creative potentials: from anticapitalistic movies, which try to take part

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in the process by provoking the audience, to the uses of Direct cinema, which was the main strategy used by the cooperatives for television. At that time, specific attention was paid to the countryside, especially during the Land Reform, and some movies were relevant examples of an "ethno-militant" cinema combining the ambitions of both ethnographic and militant cinemas. The social movements that occurred in revolutionary Portugal were also interesting material for some filmmakers, who made the meeting between cinema and feminism, or cinema and queer movement easier. Finally, the success of *Good Portuguese People* (*Bom Povo Português*, 1981) by Rui Simões, marks an aesthetical rupture in response to political change.

This dissertation has a double ambition: first, it is important to shed light on this underestimated part of Portuguese cinema, which remains unknown, with the help of testimonies of filmmaker and producers from that period. Then, by observing the practical and visual exchanges between historical process and aesthetics, the paths explored here aim to contribute to enriching the history of engaged cinema.

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