The magic of projection : augmentation and immersion in media art

Ernst, S.J.G.

1. Immersion and Augmentation Two Technical Terms

Image 16: Tony Oursler, *Eyes*, video installation, 1996.

"Rama said, ' ... How can an object of the imagination be real?' Vasistha said, 'The reality of the imagination is only partial; do not take it for something entirely real. What isn't there, isn't there. Yet the true nature of what is seen in a dream or visualized by the imagination exists at all times. Everything exists in a corner of the mind." [72]

Yogàvasistha, 9-12th c. A.D.

72 Doniger O'Flaherty (1986) p. 211.

A few years ago an Indian filmmaker e-mailed me an amazing photograph. The image was taken at dusk and showed an Indian politician giving a speech on a dusty road in front of a small number of onlookers. My friend explained how on first sight there is nothing noteworthy, this is what political campaigns in India tend to look like. Politicians address citizens through rallies, they organize door to door campaigns, road shows, or town square meetings. Occasionally politicians address their voters through television or radio interviews. However, what the image does not immediately reveal is that the politician is only a hologram.[73] On 10 December 2012, Narendra Modi, the chief minister of Gujarat and a member of the far-right Bhartiya Janta Party, gave an unusual speech by beaming his image out as a three-dimensional *avatar* to 53 locations across Gujarat.[74] Modi repeated his holographic

73 The London based company who produced the 3D projections for the Indian election campaign calls their technology 3D holography, which might be misleading as it is a two-dimensional projection onto a glass screen. http://musion.com/ (accessed on 15.2.2016).

74 Journalist Ranjeep Sardesai describes his experience of the holographic rally like this: "I watched one of the 3D shows during the 2012 Gujarat elections from just outside Vadodara. Gujaratis, like most Indians, love their cinema. This was like a political movie being played out in front of them, with Modi as the star. Just the technology which showed Modi appearing with a glow around him was enough to make the crowd feel this was '*paisa vasool*' [value for money, S.E.]. Some members in the audience would move towards the screen, trying to touch Modi, and then scream excitedly when they realized this was only a cinematic image of their leader." Sardesai (2014) e-book. For details on the technology see http://musion.com/?portfolio=narendra-modi-campaign-hologram-2012 (accessed on 15.2.2016).

Image 17: Narendra Modi 3D speech, 2014. Photo: Sanjay Kanojia.

campaign for the 2014 Indian election.[75] Modi won those elections. It is debatable whether or not this was a result of the hologram.

My filmmaker friend described the impact three dimensional projections have in India. He explained that an *avatar* is supposedly an appearance of a deity on earth. The god remains in heaven, the *avatar* is a mere sense of the god who appears on earth.[76] Most common are *avatars* of God Vishnu who will bring *Dharma*, establishing things the way they should be.[77] Perhaps the biggest illusion during the 2014 Indian presidential elections was a smart play on Hindu mythology and a 19th century stage technology called *Pepper's Ghost*.[78] Modi's image was not projected onto an ordinary cinema-screen, he appeared to be standing in front of his audience on stage. *Pepper's Ghost* is a spatial projection using reflection. The projection creates an illusion of a virtual image being actually present in material space.

Imagine this scenario: the next elections in the UK. The conservative candidate is conjured up as a ghost *avatar* in a welding factory in Coventry, the dilapidated seaside resort of Margate and a primary school in South London. An election campaign using a lowbrow stage illusion – it would probably be seen as undermining the candidates' political credibility. To me this scenario appears unthinkable. Yet, why is it hard to picture an optical illusion as appropriate medium for a British prime ministerial candidate, when it has proven so successful in India?[79] Are the Indian campaign audiences easily impressed? The people of a country with the biggest film industry of the world could hardly be media illiterate.

75 For the 2014 general elections of the Indian parliament the BJP declared Modi its Prime Ministerial candidate. Modi again was beamed out as a 3D avatar, this time all over India. With a crew of 2500 members and 125 3D projection units he was beamed to over 1300 locations. Sardesai (2014) e-book.

76 Doniger (2009) p. 201, p. 496.

77 For many Christians and Muslims in India the bitter irony of Modi's appropriation of the avatar for his political campaign is his communal politics and his role in the 2002 Gujarat riots.

78 Pepper's Ghost is a stage technique developed by Henry Dircks and Dr. John Pepper. It was named after Pepper who made the technology widely known through popular science lectures at the London Royal Polytechnic Institute, which he had joined as a lecturer in 1848. http://www.westminster.ac.uk/about-us/our-heritage/timeline (accessed on 4.10.14).

79 On the 26th of January 2015, Turkish prime minister Erdogan followed Modi's example and introduced holography to his election campaign. In Turkey the holographic technology in politics has provoked ridicule. Erdogan's appearance has inspired several satirical responses. One video likens Erdogan to the Wizard of Oz and has ghostbusters catch his avatar: https://www.youtube.com/watch?v=hnHNkiSRG6Y#t=86 (accessed on 23.4.2015). http://www.hurriyetdailynews.com/pm-erdogan-uses-hologram-to-address-izmir-party-members-for-first-time-in-turkey.aspx?pageID=238&nid=61610 (accessed on 23.4.2015).

And again, in Western societies, why do image projections appear to be seen as trivial and mere fantasies?

The two scenarios above, one real and one imagined, point toward the question I like to explore in this chapter: *In what way are projections incorporated and understood in material reality?* In the West, the dominant paradigm in image projection appears to be projection as immersion.[80] This makes sense, when we look at historical developments of projection through the lens of cinema. Often overlooked are those instances where projections are introduced into space, not played onto a distinct screen. In the following, I will look at projection as immersive as well as a way to augment reality. I will use immersion and augmentation as two distinct technical terms denoting projections that are respectively screen based or space based.

As I hope to demonstrate, the perception of projection is historically and culturally specific. With the Enlightenment, the metaphor of the window or frame became the ideal of art appreciation. In the late 17th century a shift was taking place. Illusion and the wondrous were rationalised. The image was a representation of the visible, not magically conjuring up the invisible. I propose that the change in vision during early modernity reverberates a change we are witnessing today: the framed virtual image is being 'un-framed' by mobile computing and layered into our everyday. I wonder whether mobile computing devices make the familiar strange through their augmentations.

Willingly suspending our disbelief

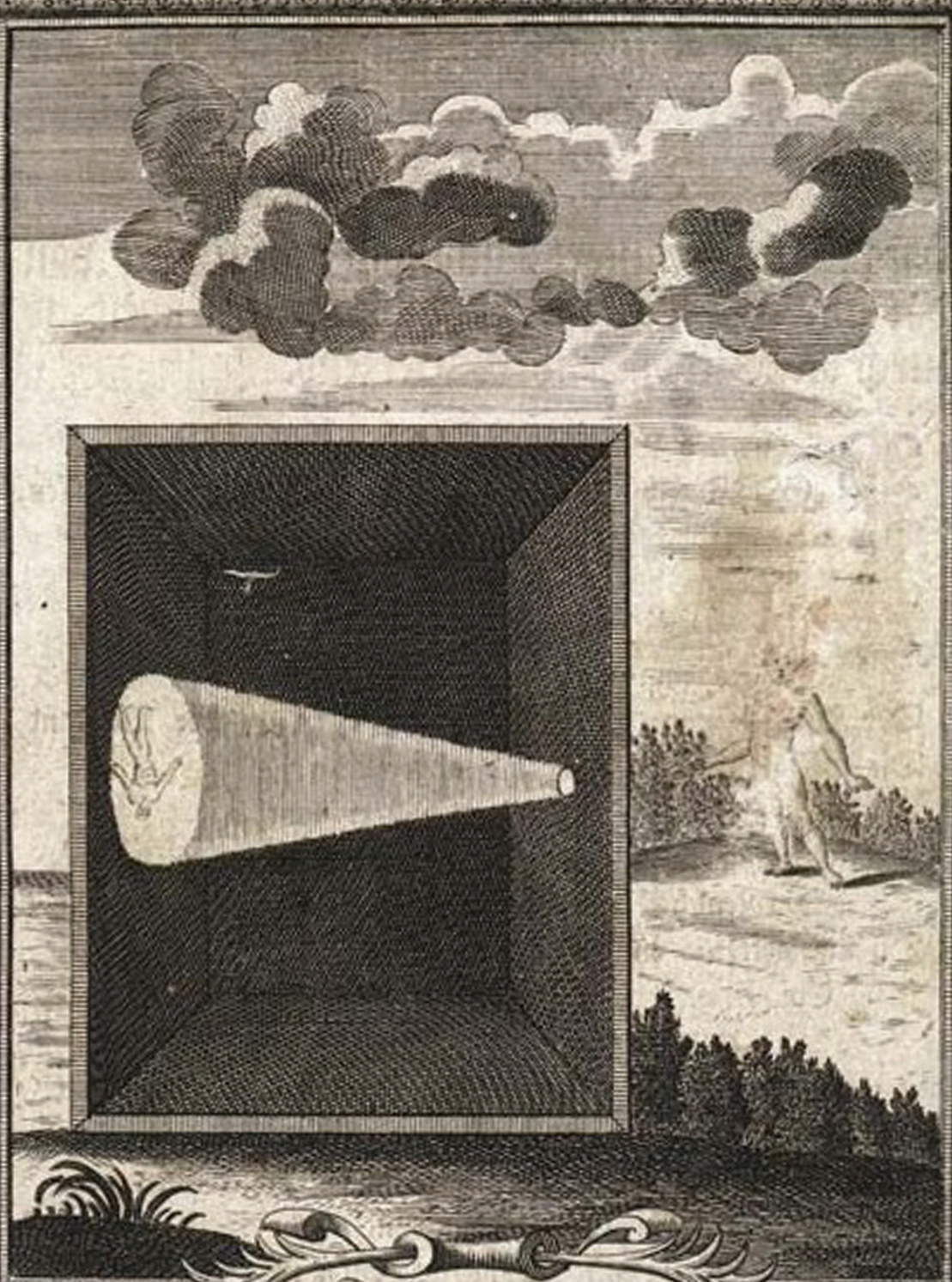
When we go to the cinema, at times we forget for a moment where we are; we immerse ourselves in the projected world. Why is this so? Why do we tend to read projected images as entertaining 'other worlds'? Unlike the so-called holographic projections described above, cinematic screen projections materialize on a well-defined static surface and create what J.R.R. Tolkien called a 'secondary world'.[81] We lose ourselves in the cinema's projected secondary world, but we are deluded when giving it 'primary belief'. Or are we "willingly suspending our disbelief"?[82]

80 Immersion is a transparency of medium, what Bolter and Grusin call '*immediacy*.' They see immediacy as the prevailing 'logic' since the Renaissance. See footnote 18.

81 For Tolkien this secondary world is a purely literary one, because, as he describes in a 1947 article, theatre (and maybe also film) only allowed for a willing suspension of disbelief as a stage trick, and, in his eyes, was always technically wanting. Tolkien (2008) p. 61.

82 Coleridge (1817) p. 267.

Image 18: A moralizing illumination from Johann Arndt, *Das wahre Christentum* (Leipzig, Johann Samuel Heinsius, 1747) p. 6-7.



Verfinstert und
Verkehrt.

At any rate, the dreamlike state seems to rely on a separation between a primary world, our off-screen material 'reality', and a secondary world, the on-screen projected fantasy. Cinema promises to take us beyond the silver-screen into a projected elsewhere. It does so by removing the viewing space as far as possible: soft seats, dimmed lights, loud sound and perplexing technology. Contemporary artists, although not fixing the viewer in a seat, often use a cinematic language. Immersive installations may obscure technology and add screens to surround the viewer.

Art historian Oliver Grau argues that the impact of a projected illusion depends partly on technological innovation and on the media-competence of the viewer.[83] I will return to his argument in chapter 3. At this point, let me tell the story of a legendary film screening, which may throw up some questions. In 1896, the Lumière brothers showed a film of an approaching train at the billiard hall of the Salon Indien du Grand Café in Paris.[84] The novelty is said to have left its audience in terror because of the astonishing visual effect and sense of reality. This occasion has been endlessly retold in films and texts on the advent of cinema.[85] Recent scholarship has disputed the truth of the story. The reports of the 1896 screening may have been a publicity stunt and much later became part of cinema's founding myth.[86] Nevertheless, the fact remains that the Lumière brothers intended, and succeeded, to create a gripping illusion. They worked on three-dimensional technologies and later reshot the scene of the approaching train in stereoscope.[87]

Image 19: *L'Arrivée d'un train en gare de La Ciotat*, dir. Lumière (FR: 1896). Moma Collection, New York.

83 Grau (2003) p. 152.

84 L'Arrivée d'un train en gare de La Ciotat, Lumière (1896).

85 Most recently in Martin Scorsese's homage to Georges Méliès *Hugo* (2011).

86 Loiperdinger, Elzer (2004) p. 94. This assertion does make sense to me. In the late 19th century audiences of the variety theatre were used to colourful and animated magic lantern shows using the latest limelight projectors. I wonder how the flickering blurry black and white film-projections may have compared to this. I suppose the astonishment of moving pictures was much more complex than the shock of overwhelming realism.

87 The exhibition of the 3-D version of the train scene took place in 1935. Zone (2007) e-book, Elsaesser (2013b) p. 882.

It is noteworthy that the same film apparently received a much more muted response in Tokyo. In Japan, early "cinema may not have represented the shock of visualised modernity precisely because it was not yet defined as visual".[88] Film scholar Aaron Gerow argues that the Lumière brothers' film was not read solely in the 'regime of sight' in Japan because of historic and cultural modes of reception.[89] Early cinema audiences were familiar with the '*gentô*' (lantern projections of the *Meiji* period) and '*misemono*' (fairground attractions of the *Edo* period).[90] The tradition of Japanese oral storytelling also played an important role.[91] Up until the 1930s films were translated, explained and commented by a '*benchi*', an orator.[92] This meant that the "[e]arly 'spectator' ... were more often listeners than viewers, enjoying the intimacy of the theatre's space as much as the illusion of the cinematic space."[93] The viewer was not completely immersed into the cinematic space on the screen.[94] These two stories from

Image 20: Scene in which Scorsese recreates the audience response to *L'Arrivée d'un train*. *Hugo*, dir. Martin Scorsese (USA: Paramount Pictures, 2011).

88 Gerow (2010) p. 28.

89 Ibid.

90 *Edo* period (1603–1868), *Meiji* period (1868–1912).

91 Tze-Yue (2010) p. 52, Lamarre (2011) p. 130, Gerow (2010) p. 27 p. 47, p. 133. During the *Meiji* period the projection lantern was re-introduced in Japan. The 'modern' lantern shows, called '*gentô*' in Japan, were popular science talks and used for national education purposes. Unlike the portable wooden '*furô*' (lantern) of the '*utsushi-e*,' the *gentô* projector was a sturdy metal projector.

92 Gerow (2010) p. 141-173.

93 Gerow (2010) p. 147.

94 Gerow (2010) p.139. Reminding the viewer of the performance not being a diegetic world has some similarity to the *V-Effect* (distancing) with which Bertolt Brecht used to break the theatric illusion.

Paris and Japan about the reception of the Lumière brothers' film shed some light on divergent histories of the reception of projection and projection technology, as well as on the myth of the terrified naive viewer and the related desire to achieve an ever greater sense of realism. This so-called realism is part of what film historian Thomas Elsaesser points at as "questionable teleologies said to drive the history of cinema".[95]

As I understand it, the immersive illusion of projection does not necessarily depend on an ever evolving technology and an media illiterate viewer, rather on the *agency* of the viewer, who is inclined to suspend her disbelief and embrace the reality of the projected virtual world. The argument, that we willingly suspend our disbelief when watching image projections, appears to be largely based on the assumption that screen reality exists in exclusive opposition to material reality, and that there is a separation between reality constructed by the projected image and material reality surrounding us. When we enter projected image worlds through doors, frames or windows we seem to leave our material reality behind. We exchange the conscious for the imaginary. And we enter from a realm of belief into a realm of disbelief. Samuel Taylor Coleridge, who coined the term 'willing suspension of disbelief', called it 'poetic faith.'[96] This kind of immersion seems to be the most common approach to image projection in the West, and is largely a product of a definition of material reality as actual space which stands in opposition to illusionary space. Ideas, such as image space as frame, window or door, *poetic faith,* and *willing suspension of disbelief*, bridge the opposites of appearance and material reality. This divide between 'real' and 'virtual' reality originated in the Renaissance framing of vision (i.e. window, door).

The framed viewing field[97]

It is a truism, according to Elsaesser and his colleague Malte Hagener, that "when we see a film, we always cross a border and enter into another world that is different from ours".[98] A metaphor for this 'liminal experience' can be the projection screen

95 Elsaesser (2013a) p. 225.

96 Of course Coleridge was in the early 19th century discussing theatre or the romantic novel rather than projection media and film. Coleridge (1817) p. 267.

97 With respect to the frame, most useful has been the writings of Elsaesser, Grau and Friedberg. On virtuality, how we construct images and how images are in the world see: Mitchell (2005, 1994), Belting (2004), Van Alphen (2005).

98 Elsaesser, Hagener (2010) p. 39.

as such or the door.[99] Early 20th century film theory articulated cinema according to the ontological metaphors of the window or the frame, representing respectively realist or constructivist film theory.[100] According to Elsaesser and Hagener, realist and constructivist film theory both approach film projection as ocular (the viewer has visual access to on-screen events), transitive (a two dimensional projection transforms into three dimensional space beyond the screen) and disembodied (the viewer retreats into the dark space of the auditorium, and material reality is cancelled out). The film historians link the metaphor of window and frame to a humanist understanding of the image, and state that historically the metaphors rely on the "Renaissance ideal of art appreciation – marked by individual immersion and contemplation of the work".[101] Immersive cinematic spaces are constructed according to the rules of perspective.

The perspectival representation renders the screen 'transparent' and lets us focus on the other world that is projected, as art critic Janneke Wesseling points out in her book on reception aesthetics.[102] This is only partly true, as she continues to show. It is our perspective as subjective viewer as well as the representation (painting, film) as image *and* object that condition the viewing experience.[103] The images materialize by way of a medium (monitor, canvas, screen), the projected images themselves are the 'presence of an absence'.[104] Art historian Hans Belting articulates this dualism of inside and outside as: "The framed viewing field, which was to be inherited by the TV screen and beyond, first relied on a most specific window architecture, which developed in the European middle ages, and second, *on a corresponding European mentality eager to control the world via a tele-view from*

99 Ibid.

100 Constructivist film theorists included Béla Balázs and Rudolph Arnheimer, Realist film theorist with a phenomenological outlook included Siegfried Kracauer and André Bazin. Elsaesser, Hagener (2010) p. 14.

101 They continue to show how this reference to Renaissance art appreciation was to elevate film into the realms of established arts, away from early associations of film with 'collective and distracted' fairground pleasures. Elsaesser, Hagener (2010) p. 16.

102 Wesseling (2014).

103 Ibid.

104 Belting (2004) p.54. Art historian Hans Belting defines for us "[T]he factual presence and visibility of images rely on their transmission by a given medium in which they appear or are performed, whether they turn up on a monitor or are embodied in an old statue. In their own name, images successfully testify to the absence of what they make present." Belting (2004) p.55.

within, meaning from a position apart (a dualism separating inside and outside, subject and world). [Italics SE]"[105] The window view answered an Enlightenment desire for framing and dominating the world. Historian Stuart Clark points out how "[d]uring the early modern period ... vision was anything but objectively established".[106] The change came with the Enlightenment, when the image became a record of the visible rather than conjuring up the invisible; paintings were specimens of the material world to be studied. 17th century Dutch painting used methods of perspective and newly developed optical tools in their '*knowledge production*'.[107] The camera obscura, precursor to the photographic camera, was an ideal tool to register, copy, or fixate the image of projected reality.[108] The single lens camera, which has come to dominate visual representation, reinforces the framed view and central perspective. According to art historian Svetlana Alpers, realism "was celebrated as giving basic access to knowledge and understanding of the world".[109] Knowledge would 'dispel myths' and 'overthrow fantasy'. And "the mind, conquering superstition, [was] to rule over disenchanted nature."[110] This form of 'knowledge production' was an attempt to create a consensus on visual reality. From the point of view of power, it might appear attractive to control what is acceptable sight and what is considered visual error. The project of Enlightenment was aimed at dominating perception. This attitude towards the visible would impact conditions of society. Art historian Ernst Gombrich raised the question whether all cultures feel the need to 'iron out' the contradiction between 'reality' and 'appearance'.[111] And, we may extend this question by asking, which imaging concepts may be alternatives to the framed viewing field? One such concept that offers a mixing of reality with the virtual is augmentation.

105 Belting (2004) p. 53.

106 Clark (2007) p. 1.

107 To refer to Panofsky, use of perspective resulted in an objectification of the subjective. See chapter 3.

108 Whether or not Dutch artists have been using optical tools has been the subject of much debate. Alpers as well as David Hockney have brought on convincing evidence that they did. Hockney (2001), Alpers (1984) p. 74.

109 Alpers (1984) p. 72-73.

110 Adorno, Horkheimer (2002) p. 1-2.

111 I found this quote in Wendy Doniger's book on illusion in stories and myths: Doniger O'Flaherty (1986) p. 11.

Augmented reality

To augment means to increase, extend or expand. Augmented Reality (AR) is an enlarged reality where material surroundings are expanded by virtual (projected) information. The term Augmented Reality was coined in the 1990s by computer scientist Tom Caudell, then working for Boeing.[112] Computer scientists Julie Carmigniani and Borko Furht define AR as "a real-time direct or indirect view of a physical real-world environment that has been enhanced/augmented by adding virtual computer-generated information to it."[113] It is a 'mixed reality'.[114] In this mixed reality projected beliefs (imagined or remembered) are not positioned in opposition to material reality. *Instead of juxtaposing a realm of belief to a realm of disbelief, as with immersion, we experience a heightened sense of belief.* When we look at augmenting image projection, we do not experience an immersion into an absent image world, rather we become aware of that which is imagined or remembered in the context of that what is present. The projected image is inserted as a possibility into a social situation.

Augmentations take place *in conjunction with* material reality, trying to appear *in* reality, yet like any projection the virtual images need a screen to manifest themselves. AR, as an interactive mixed reality, relies on gadgets such as a smart phone or tablet, head mounted display, or media goggle. Computer generated images are projected over our field of vision, letting us see material and virtual reality at the same time. In combination with GPS, wifi and orientation applications the augmenting information can relate instantaneously to the place we are at. AR may have a future in urban advertising, gaming and new applications of social networking.[115] In museum display, AR can enhance viewing experiences, add a tactile dimension, and give intuitive access to information. To give an example, Museum Boijmans Van Beuningen in Rotterdam collaborated with artist Joachim Rotteveel and the Royal

112 Carmigniani, Furht (2011) p.4.

113 Carmigniani and Furht (2011) p. 3.

114 Mixed reality is defined by communication researcher Fumio Kishino and engineer Paul Milgram as bringing together real and virtual worlds. This could be augmentation of reality or also augmentation of virtuality. They say "the most straightforward way to view a Mixed Reality environment, therefore, is one in which real world and virtual world objects are presented together within a single display, that is, anywhere between the extrema of the virtuality continuum." See Milgram, Kishino (1994).

115 Schmalstieg et al. (2011) p. 13-38.

Academy of Art The Hague on an exhibition of medieval pottery.[116] By handling plain white reproductions of pottery shards the visitors could see a virtual object moving simultaneous on a screen where the missing pieces were revealed.[117]

AR can be useful in diagnostics, in medicine and mechanics alike. And heads-up displays will project your car navigator onto the windshield so you can keep your eyes on the road. These technologies are offshoots of AR developed for the military. Combat soldiers deal with an information overload, yet they have to make on-the-spot decisions. AR based complex situational awareness systems will improve 'combat efficiency'. Not only on the ground; the 'super cockpit' developed in the late 1960s used AR.[118] The heads-up system superimposed information onto the field of vision of the pilot, "leaving the pilot to mentally merge the virtual map with his visual field".[119] AR is also being tested in policing for instant

Image 21: Joachim Rotteveel, *Sgraffito in 3D* (2009).
Image 22: Head-up system in a Eurofighter.

116 Sgraffito in 3D, 25 October 2008 - 4 January 2009, Museum Boijmans Van Beuningen, Rotterdam.

117 Kolstee et al. (2009) p.12. Also see http://www.sgraffito-in-3d.com (accessed on 21.2.2014).

118 Livingston et al. (2011) p. 634.

119 Livingston et al. (2011) p. 677.

identification, by using biometric and voice recognition, and enhanced vision (even through walls) using infrared and thermal imaging.[120]

The above examples of augmentation all depend on viewing gadgets and computer generated information. Information-, reconnaissance- and identification-technologies are incorporating AR. The ultimate aim of AR technology is a system in which virtual and actual become indistinguishable.[121] The technological developments ostensibly introduce augmentation as a new method of visual communication. Projections that augment space may have had a marginal presence in art and visual culture, but expanding space with virtual images has a long history, as I will illustrate in the coming chapters. The developments in AR introduce new technical tools that are also of interest to artists. Besides technical innovation, AR technologies change our sense of reality and space. Elsaesser speaks of a resetting of our ideas on images taking place. In this 'cultural shift' "our sense of spatial and temporal orientation and our embodied relation to data-rich simulated environments" is changing.[122] We used to experience projections framed on a screen. These projections were not experienced as magic, but involve the viewer who was willingly suspending his disbelief. We may observe a shift in today's experience of the virtual. Efforts are made to 'un-frame' the virtual image through mobile computing. Mobile devices augment the everyday world by layering information into the space surrounding us.

Virtual augmentations do not require us to suspend our disbelief. Rather, I suggest, augmentations could be *analogical demonstrations,* magical symbols visualising the invisible and hidden. Virtual images are not necessarily purpose in themselves, they can be interfaces or 'portals' to other images or information and invite action.[123] We experience a 'mixing of reality' of the physical and virtual. New technologies enrich and simplify our lives. On the downside of it, augmentation technologies seem to *sell and betray us*; they bring about a surveillance and commodification of our everyday movements.

In opposition to this, augmenting projections have the potential to engage or to interfere directly with the world that surrounds us by 'making strange'. Ernst Bloch suggests that "strangeness that does not betray and sell us has a wholly different effect.

120 Cowper, Buerger (2003).

121 Transparent immediacy. Bolter and Grusin (2000) p. 30.

122 Elsaesser (2013a) p. 221.

123 Elsaesser (2013a) p. 241.

It makes the beholder look up".[124] The projected image as a 'stranger' can bring about recognition.[125] To me as an artist projection as a 'stranger' is an attractive thought. Instead of creating a separate reality with a logic of its own, a projection interjected into the world can say something about that world using a *parallel image*. The concepts of 'magical symbols', 'analogical demonstrations' and 'making strange' need some explanation.

Magical symbols

The answer to Gombrich's earlier mentioned question on inconsistency of perception is evasion. He said: "[e]ven in our rationalist culture we don't often live up to this [radical distinction between appearance and reality] ... We try to evade it, especially when our emotions are involved."[126] Although, imaging concepts alternative to the framed viewing field of Enlightenment existed, they were meant for 'simple minds': projectionist and aeronaut Étienne-Gaspard Robertson writes how children, unlettered people and villagers may still believe in magic and the devil during the late 18th century.[127] When vision was framed during early modernity, imagination and illusion were discredited as charlatanism or the lowly entertainment of a 'gypsy beauty' from the fairground.[128] Historian Koen Vermeir describes a shift that took place in the meaning of illusion and the wondrous.[129] In the late 17th century opposition to illusion increased, because it was holding up progress. Vermeir explains that the perceived problem with magic was the thin line between *delusion* and *allusion.*[130] For instance, Catholic theology was based on illusional transformations

124 Bloch (1970a) p.123.

125 "[T]he beholder achieves insight by means of the estrangement-effect which can turn into its dialectical opposite-the recognition, or 'Aha!' experience". Bloch (1970a) p.124.

126 Doniger O'Flaherty (1995) p. 28.

127 Robertson (1831) p.143-149.

128 "Such an alternative genealogy, tracing lines of descent of monocular cinema's illegitimate brother, the camera obscura, but blood-related to the gypsy beauty from the fairground and the itinerant magic lanternist". Elsaesser (2013a) p. 234

129 His essay on the magic of the magic lantern demonstrates how a Jesuit scholarly text (Kircher's *Ars Magna*), if read symbolically, reveals a catholic order, or philosophy, rather than verifiable demonstrations in physics. Kircher himself addresses the reader to this effect by comparing the ten chapters of the book to the ten Sephiroth of the Kaballah, the Kaballistic cosmology, basically comparing his book with a revelation of a divine order. Vermeir (2005) p. 138.

130 On magic see also chapter 5.

(transubstantiation of water into wine, divine providence, miracles) and relied on beliefs in the supernatural. Vermeir writes, the Catholic "worldview [was] based on the invisible beneath the visible".[131] The church would use artifices such as the magic lantern projector to show the invisible as an analogy.[132] With the magic lantern Jesuits could visualize inner images to lay people by simplifying and mechanising the spiritual and psychedelic exercises performed in cloisters.[133]

The idea of visualising the invisible as an *analogy* seems to me an apt concept when looking at the experiences projections can generate. That what is invisible or not present is projected as a parallel image, which could be read as metaphor. The parallel image could also be a substitute, like in a mirror box. (A mirror box is used in clinical medicine to treat amputee patients' phantom limb pain. The missing limb is simulated in a reflection.) Vermeir coined the term *analogical demonstration* which is a magical symbol visualising invisible and hidden processes in nature. He defines it as "a physical (instead of mathematical) demonstration of something invisible, something indemonstrable in a direct way".[134] In a pre-modern world full of inexplicable supernatural and miraculous

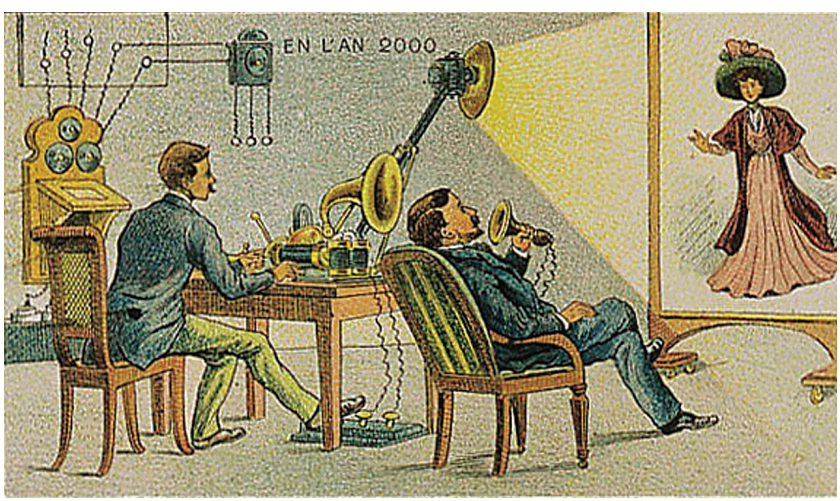


Image 23: Villemard, 'En l'An 2000', Correspondance Cinéma-Phono-Télégraphique, cigar box inserts, Chromolithographie, 1910, Paris. Bibliothèque nationale de France.

131 Vermeir (2005) p. 155.

132 Jesuit theatre. See Vermeir (2003) p.2.

133 Kittler (2010) p. 79.

134 Vermeir (2005) p. 156.

phenomena a magical symbol could visualize the invisible. Vermeir claims that *magic lantern* projections, in a baroque sensibility, were seen as *magical symbols*.[135] The *magic lantern* was a projection machine that became a popular form of entertainment in the late 17th century. The lantern could *show* and *explain* at the same time. The lantern was a counter-model to enlightened objectivity and rational progress that aspired to dominate nature.[136] Psychophysiological space – in-homogenous experience of space – extended with 'analogical demonstrations' might create an experience of 'magical space'.[137]

Making strange

The author Victor Shklovsky understood art as a technique to produce awareness. He coined the concept of '*ostranenie*' (making strange in Russian) and stated that "[t]he technique of art is to make objects 'unfamiliar' to make forms difficult".[138] Bertolt Brecht might have been familiar with Shklovsky's 1916 article *Art as Technique*. Bertolt Brecht elaborated on the idea of *ostranenie* and used '*Verfremdung*' to expose '*Entfremdung*'.[139] Brecht intended to shake the viewer and expose the "condition of diversionary and stultifying alienation" they find themselves in.[140] *Verfremdung* is a term used by Bertolt Brecht in his theory of *epic theatre. Epic theatre,* according to Brecht, distinguishes itself from classical theatre (Aristotelian theatre) through forms of distancing. Aristotelian theatre induces immersive amusement, *epic theatre,* on the other hand, is inviting a critical point of view.[141] Brecht calls this the *V-Effect*, V is short for *Verfremdung*.[142] He says: "The V-effect consists in turning the object of which we are to be made aware, to which our attention is to be drawn,

135 Analogical demonstration or a metaphysical symbol. Vermeir (2005) p. 150-152, 158.

136 Vermeir (2005) p. 158. "[Cassirer] defines the symbol "in which something 'sensuous' (ein Sinnliches) is represented as a particular embodiment of 'sense' (Bedeutung/ meaning)." Neher (2005) p. 360. Compare footnote 245.

137 To recall Panofsky: *perceived space* is represented either as *logical form* or *visually symbolised,* either as geometrical space or a symbolic space. Panofsky (1927/ 2002) p. 66/ p. 31.

138 Shklovsky (2006) p. 778.

139 Bloch (1970a) p. 125.

140 Bloch (1970a) p. 121.

141 The distinction of the epic, producing distance, and the dramatic, immersing in immediacy, go back to the discussion between Schiller and Goethe. See Safranski (2005) p. 432-3.

142 Brecht (1963) p. 182-183.

from something ordinary, familiar, immediately accessible, into something peculiar, striking and unexpected."[143]

Verfremdung and *Entfremdung* are words without a perfect match in English, also *ostranenie* is apparently difficult to translate.[144] Key ingredient is the word 'strange' or alien. Bloch explains "[a]lienation, estrangement: the terms are bound together by the alien, the external; yet in them evil and beneficient [sic] modes of experience can be distinguished in specific, very particular ways."[145] The evil mode: alienation from ourselves in our commodified lives. The beneficent mode: distant strangeness which can evoke surprise and "makes the beholder look up".[146] I see augmentation as a technique in art to 'make strange' and create a distance, that can be either pleasant or unsettling. The technique of distancing is far from new, but is an essential method in art making. It lets us imagine things differently. Augmenting projections are persuasive, not because they are materially 'real', rather because they make visible what we could *imagine* as real.

Image 24: Krzysztof Wodiczko, *The Tijuana Projection*, Public projection at the Centro Cultural de Tijuana, Mexico (2001).

143 Brecht (2014) p. 192.

144 Berlina (2016) p. 14.

145 Bloch (1970a) p. 121.

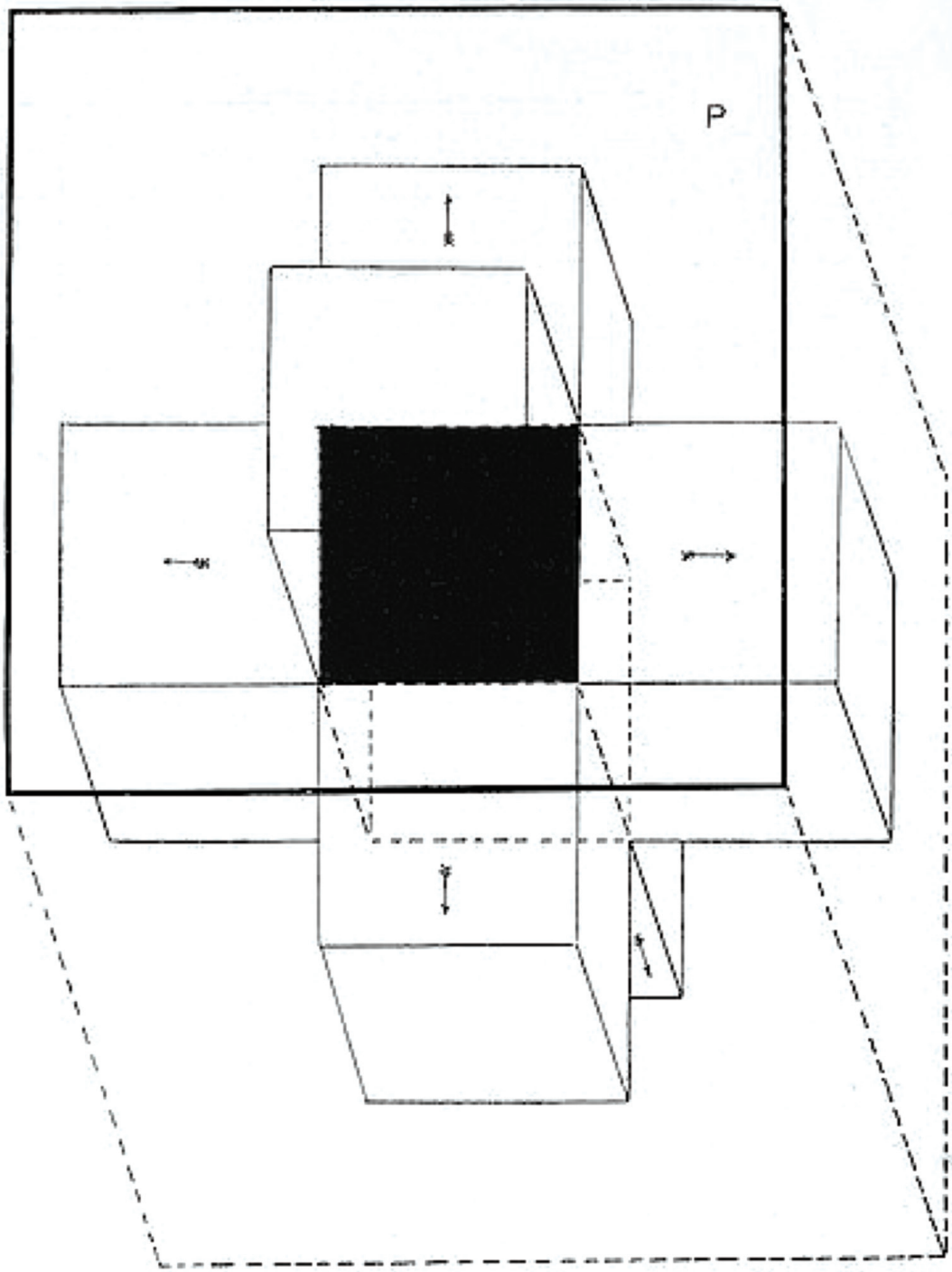
146 Bloch (1970a) p. 123.

To summarise: I argue, since Enlightenment projections have been understood as framed illusions. We tend to experience projected films immersed into an absent image world. We suspend our disbelief when looking at projections; we are giving primary belief to the projection although we know it to be untrue. We embrace illusions as separate from physical reality, out of a tradition of image reception where we are framing a projected other world. Enlightenment established vision 'objectively' and, hence, the projected 'other worlds' provoked 'poetic faith' in us as viewers. The introduction of the single lens camera reinforced the framed view and central perspective.

Projection is not always and everywhere understood solely in the regime of objective sight; illusions have been accepted also as true without proof. The example of Modi's political campaign shows how in India the projected avatar can be understood as a symbol of (godly) power. In Europe, humanist knowledge systems were countered by those using projection-magic: for instance the Jesuit theatre and, on the bottom of the ladder, the showmen at fairs and the vaudeville. Although the dominant paradigm of projection in the West has for the last two centuries been immersion, our relation to image projection is changing. Today augmented reality is entering our everyday experience with mobile computing technology. Images are becoming interfaces and access points in *data-rich simulated environments*. The technologies are new, augmenting as such not.

I distinguish between *magical-* and *critical-augmentations*. In my artistic praxis I observe how by projecting an image onto an object, this object is augmented and gains a different reality. Projections are short lived. However, how we see an object has little to do with its permanence, more with what we think possible. Critical augmentations can enlarge an object's possibilities.

The history of projection technology is often told with cinema as the happy ending. However, throughout its history there have also been experiments with projection machines *augmenting* reality, which I will study in more detail in chapter 4. Augmentation promises to become a new paradigm with a wide field of application. As a projection method it can be used to inform, it can be misused to track our movements or commodify the world that surrounds us. (Think of navigation or AR apps incorporating pre-selected information and advertisement based on interest, web surfing habits, and location.) Alternatively augmentation could describe a tool in political activism and art which critically engages us by making the familiar look strange, for instance *The Illuminator* (insert 1). In the next chapter I turn to how immersion and augmentation are applied in contemporary art.


P

Light ARCHITECTURE:

Theo van Doesburg and László Moholy-Nagy

In an 1929 essay for the magazine *Die Form*, Theo van Doesburg reviewed the state of film as an artistic medium. His main point of critique was that, although film was used effectively for its illusionist qualities and avant-garde film had developed something like an optical poetry, the medium had not yet been used to its fullest potential. In his words: "the projection-screen has been seen as canvas until now, even as a canvas limited by a frame. One should finally discover the light-space, the film-continuum. The technical attempt to give shape to the time dimension in film, a dimension which is missing in static images, failed. The origin of this failure is the consideration of the projection surface as a painterly canvas." "Instead of a painterly approach, an architectural attitude will be necessary. Because the newly mastered material will enable a new *architecture of light* and can produce quite unexpected dimensions."[147] Film operated only within the strict frame of the projection screen, whereas Van Doesburg called for breaking open the surface of the screen, in order to explore the true depth of the projection; light – movement – space – time – shadow are the basic components of *dynamic light architecture*.

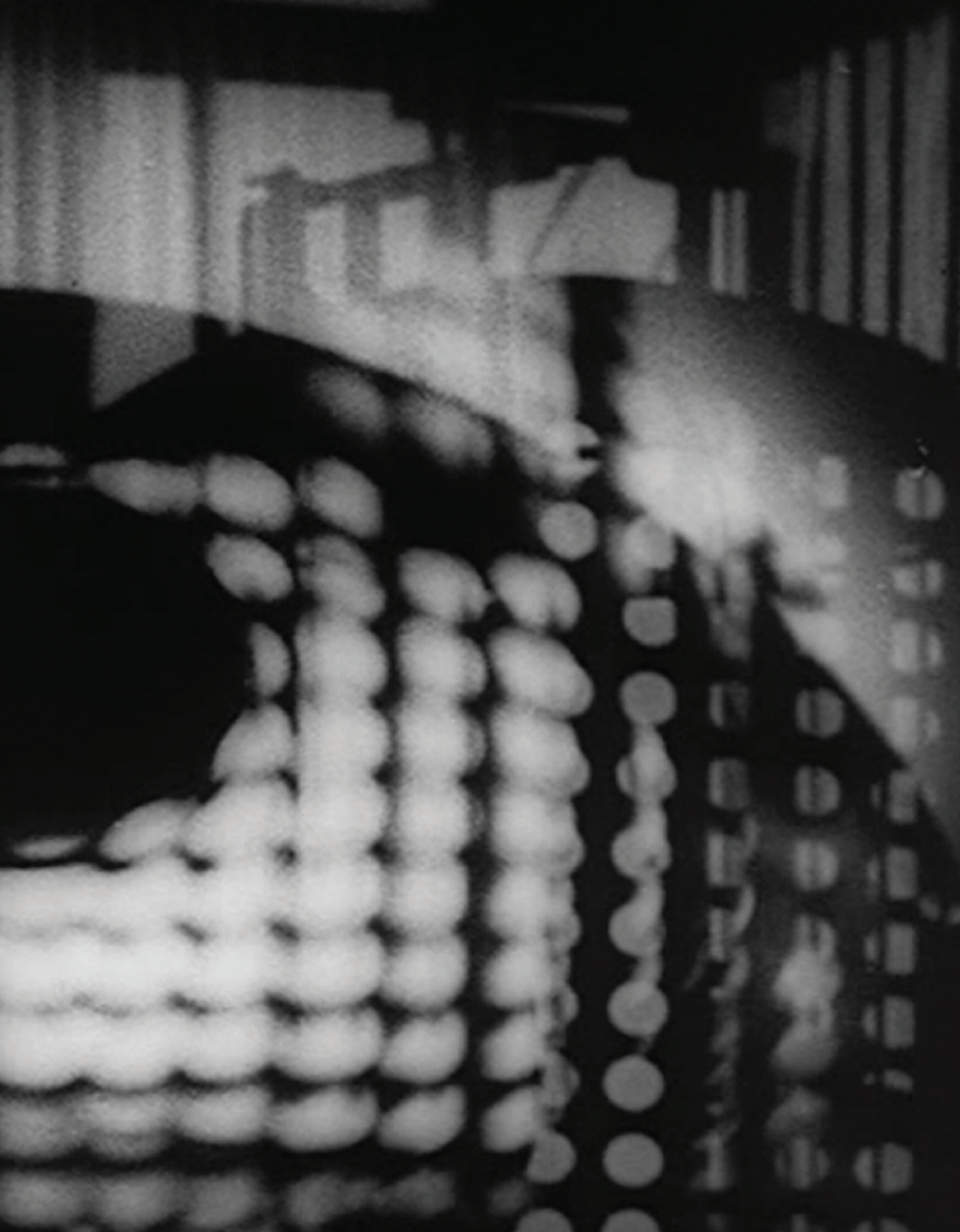
A diagram accompanying the article visualises the *fields of projection* in relation to the conventional projection screen. To me the reference to architecture is significant. The projection is to be 'built' into space, the viewer will not view the film from a remote position, but rather experience it physically, which, according to van Doesburg, does not imply illusion.[148] Van Doesburg does not give any examples of this new film-architecture. His ideas may have been fuelled by a projector László Moholy-Nagy developed around the same time. Moholy-Nagy saw the *light-prop* or *Lichtrequisit einer elektrischen Buehne* (1922-1930) as an attempt in design light architecture: "The light-prop could prompt numerous optical findings, and it seems appropriate to pursue these experiments as planned, leading to light and motion design."[149]

Image 25: Theo van Doesburg, *Film als reine Gestaltung*, (1929).

147 (Translation S.E.) van Doesburg (1929) p. 248.

148 Ibid.

149 (Translation S.E.) Moholy-Nagy (1930) p. 157.



Moholy-Nagy had extensively studied the possibilities of creation with light and movement in photography, film, and sculpture. He dreamt of a projection tool which could create visions on unusual screens such as clouds and fog in the air. When the light-space-modulator was turned on for the first time, Moholy-Nagy felt like a 'sorcerer's' apprentice.[150] He wrote: "The mobile was so startling in its coordinated motion and space articulation of light and shadow sequences that I almost believed in magic."[151] By evoking Goethe's *Zauberlehrling*, did Moholy-Nagy gesture to the possibilities as well as the possible failure he saw in the experiment? The archive at the van Abbe museum gives a glimpse of insight. Correspondence from 1971 between the museum director Jean Leering and Moholy-Nagy's Daughter Lucia suggests that Moholy-Nagy predated the work. Lucia Moholy writes in a letter to Jean Leering, 21 june 1971 "..." ... from today's perspective, I am of the opinion that the onset of the realisation could not be before 1928".[152] This may explain why van Doesburg did not mention the light-space-modulator in his 1929 text. And why did Moholy-Nagy predate the work? We can only speculate. Journalist Nan Rosenthal, in an unpublished paper of 1969, gives an idea of the technical and financial hurdles that eventually may have made Moholy-Nagy give up on one of his most spectacular projects.[153]

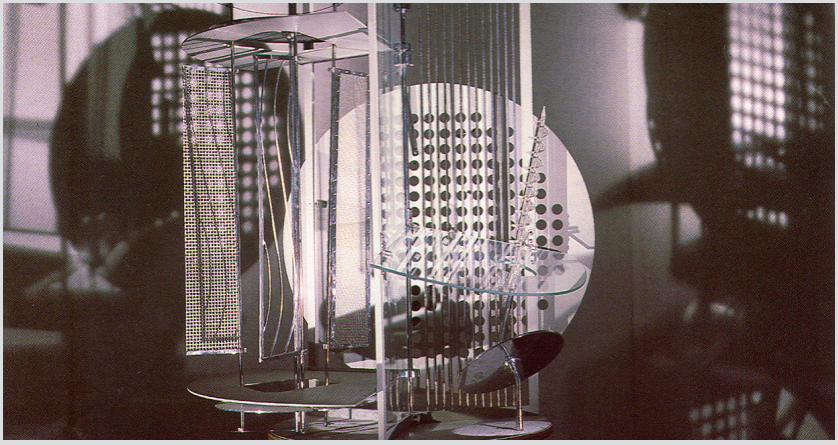


Image 26: László Moholy-Nagy, *From Ein Lichtspiel Schwarz Weiss Grau*, Film, 1930.
Image 27: László Moholy-Nagy, *Lichtrequisit einer elektrischen Buehne* (1922-1930).

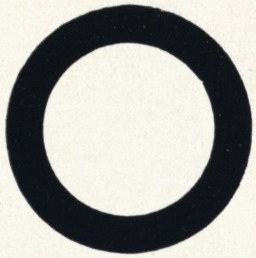
150 „Die ich rief, die Geister, Werd' ich nun nicht los" is one of the the most quoted lines from *Der Zauberlehrling,* Johann Wolfgang von Goethe, 1827.

151 Kaplan (1995) p. 158/159.

152 (Translation S.E.) Archive van Abbe Museum, Eindhoven.

153 Archive van Abbe Museum, Eindhoven.

Verarbeitung des Mülls in Fabrikbetrieb.
Berge von verrosteten Schrauben, Büchsen, Schuhen usw.
PATERNOSTER-Aufzug mit Aussicht bis ans Ende und zurück. Im Kreis.



Der ganze Film wird von hier (verkürzt) RÜCKWÄRTS gedreht bis zu der JaZZ-BAND (auch diese umgekehrt)

von **FORTISSIMO-o-O**

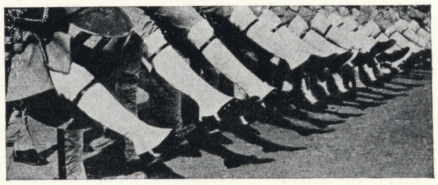
bis **PIANISSIMO**

Militärparade

Glas Wasser.
Leichenschau (Morgue) von oben.

RECHTS-RECHTS
RECHTS-RECHTS

MARSCH-MARSCH-
MARSCH-MARSCH-RECHTS



REITDAMEN - LINKS
Die beiden Aufnahmen übereinander kopiert, durchscheinend.

LINKS-LINKS-LINKS