Luisa Feiersinger

# Spatial Narration

## Film Scenography Using Stereoscopic Technology

### Situating the Screen in Stereoscopic Practice

If the screen is a plane on which images are displayed in order to view them, then what precisely happens to the screen in those films that are presented under the catchphrase *3-D*?[1] The visual impression created by such *stereoscopic* films is based on a technical imitation of binocular vision, which allows for the perception of three-dimensionality. Through an intricate arrangement of projectors, filter foils, specially coated screens, and distinctive eyeglasses, two film tracks – each taken from a slightly different perspective – are simultaneously delivered to the eyes of the spectator. The viewer is able to perceive a visual space that is not merely restricted to the plane of the screen, but expands in front and behind it. This *negation of the screen*, in which the abstraction of two-dimensionality appears to dissolve, has always been been understood within film theory as a means of achieving greater immediacy.[2] Miriam Ross, in her recent discussion on stereoscopic visuality, actually begins her analysis by asking whether the screen is even still present.[3] She reaches the conclusion that the screen dissolves into a "field screen," thereby facilitating a "fundamentally different viewing experience."[4] That a change in the filmophanic space[5] occurs is indisputable, but if one wishes to situate the screen in visual practice, as this volume suggests, then the bigger picture – so to speak – must be considered. As such, the stereoscopic image space, having dispensed with planar limitations, can only be generated through particular filming techniques and mise-en-scène strategies. Fully in the tradition of narrative cinema,

1 This essay was first published in 2015, and has been translated and revised for this volume. I thank Deborah J. Curtis and Julia Sittmann. For the original text see Luisa Feiersinger, Räumliches Erzählen. Filmszenographie in stereoskopischer Technik, in: Annette Dorgerloh, Marcus Becker (eds.), *Alles nur Kulisse?! Filmräume aus der Traumfabrik Babelsberg*, Weimar: VDG, 2015, pp. 140–145.

2 A comprehensive introduction to the historical background is beyond the scope of this essay and, therefore, reference is only made here *pars pro toto* to Arnheim, *Film als Kunst,* Frankfurt/M.: Suhrkamp, [1932] 2002, and to André Bazin, Der Mythos vom totalen Film, in: Robert Fischer (ed.), André Bazin, *Was ist Film?,* Berlin: Alexander Verlag [1946] 2009. Although their basic approaches are almost diametrically opposed, both film theoreticians ascribe an "immediacy of appearance" and thus a direct influence on the viewer to the three-dimensional film. Arnheim 2002, p. 266; Bazin 2009, p. 47.

3 Miriam Ross, Stereoscopic Visuality. Where is the Screen, where is the Film?, in: *Convergence. The International Journal of Research into New Media Technologies*, 19.4 (2013), pp. 406–414, p. 406.

4 Ibid., p. 413. It must be mentioned, that she also discusses the aesthetic changes in stereoscopic film based on its technical conditions.

5 This text draws on the *Vocabulary of Filmology* used by Etienne Souriau to make a distinction between the reality that is independent of the film ("afilmic reality"), the reality that pertains to the film ("profilmic reality"), and the narrated world ("diegesis"), as well as to separate the processes and characteristics of film projection ("filmophanic reality") from those of the film material ("filmographic reality"). Etienne Souriau, Die Struktur des filmischen Universums und das Vokabular der Filmologie, in: *montage/av*, 6.2 (1997), pp. 140–157.

the mediation itself (the complex technological and cinematographic arrangement that produces the image) must be rendered invisible to the viewer.[6]

The ostensibly *negated screen* is made expressly manifest in the practices and techniques involved in producing the immediacy of this perception, and stereoscopic films – just as any other screen-based images – are impossible to conceive of outside their production and reception possibilities. An investigation of the film-image in films produced since 2009 must be based on its interconnection with its production techniques – not because the visual space created through stereoscopic technology is new,[7] but because the combination of stereoscopic alignments with digital recording, processing and playback techniques is. Although the shift from analog to digital techniques may not have been apparent to the untrained eye, this transition was essential to the development of the aesthetic qualities inherent to contemporary stereoscopic visual imagery.[8] In order to investigate how narration can take place through and within stereoscopic film spaces, three vital questions must be addressed: firstly, how does this diegetic space interact with the boundaries of its images, both on the plane of the screen, and within the projection that extends beyond it? Secondly, how is the profilmic space prepared and translated for the shot, using cinematographic techniques? Finally, how has the understanding of these cinematographic practices and the existing technical requirements favoured the formulation of specific narrative structures and motifs? In the following, Alfred Hitchcock's film, *Dial M for Murder* (1954),[9] produced using analog technology, and *The Three Musketeers*, an exemplar of digital stereoscopic films, directed by Paul W. S. Anderson (2011),[10] will be compared in order to illuminate these issues.

## Translating Diegesis into Stereoscopic Film Space

In *The Three Musketeers*, Alexandre Dumas' well-known story is re-packaged as a action movie spectacle, meant to satisfy modern sensibilities: With the help of inordinate amounts of weaponry, the three musketeers and the young D'Artagnan foil a conspiracy by Cardinal Richelieu to rob the inexperienced King Louis XIII of the throne. Central to the plot is a necklace belonging to the Queen, which – in the wrong hands – could trigger war between England and France. This diegetic 17th Century France is located in the profilmic spaces of Bavarian castles and Babelsberg green-screens, where a new world was created, which fulfilled the visual requirements of stereoscopic films, while

6 This structure of technical images is known as the "principle of disjunction" in the discipline of *Bildgeschichte*, Horst Bredekamp, Angela Fischel, Birgit Schneider, Gabriele Werner, Bildwelten des Wissens, in: *Bildwelten des Wissens. Kunsthistorisches Jahrbuch für Bildkritik*, 1.1: Bilder in Prozessen (2003), pp. 9–20. Not by name but in principle, it was established for the two-dimensional film by Bordwell, Thompson and Staiger in their seminal study on the classical Hollywood cinema. David Bordwell, Janet Staiger, Kristin Thompson, *The Classical Hollywood Cinema. Film Style and Mode of Production to 1960*, London: Routledge, 1994.

7 For in-depth information on the history of stereoscopic films and their occurrence in waves, see Ray Zone, *Stereoscopic Cinema & the Origins of 3-D Film, 1838 –1952*, Lexington: University Press of Kentucky, 2007; Ray Zone, *3-D Revolution. the History of Modern Stereoscopic Cinema*, Lexington: University Press of Kentucky, 2012.

8 Thomas Elsaesser highlighted this link in an essay on the re-establishment of stereoscopic films since 2009, emphasising the benefits of the visibly *different* stereoscopic film image for the dissemination of digital technology. Thomas Elsaesser, The 'Return' of 3-D. On Some of the Logics and Genealogies of the Image in the Twenty-First Century, in: *Critical Inquiry* 39 (Winter 2013), pp. 217–246, pp. 221–225.

9 Alfred Hitchcock, *Dial M for Murder*, USA 1954, in: 3-D Blu-ray, Warner Bros. Entertainment Inc. 2012, 105 Min.

10 Paul W. S. Anderson, *The three Musketeers*, Germany/France/UK/USA 2011, in: 3-D Blu-ray, Constantin Film 2011, 111 Min.

simultaneously serving as a visual subtext for the plot and its characters. Richelieu's room and its furnishings, for example, convey his tactical cleverness: Our first encounter with the Cardinal is cinematically staged over a chessboard, as the camera pans upwards from a close-up of the chess pieces towards a medium close-up shot of his face.[11] In this sequence, the game of chess and the Cardinal's face are arranged not only on a vertical axis, but also positioned separately in the depth of space produced by the stereoscopic film. The elements of the image are distributed visually in this stereoscopically-created space (depending on where the optical axes of the two image tracks intersect) either in front or behind the plane of the screen, the so-called *zero parallax*.[12] While the chess pieces are in front of this plane – referred to as *negative parallax* – the Cardinal's face is in *positive parallax*, namely behind it. The game of chess is thus spatially accentuated, through its position directly in front of the eyes of the audience. That the game serves as an allegory for the Cardinal's political manoeuvres – which he plans like chess moves – becomes abundantly clear as the scene continues, and Richelieu reveals to his interlocutrice, *Mylady*, that he only ever plays against himself – no other suitable challenger exists.[13] Standing behind the table with the chessboard, the protagonists are shown in a two shot – wherein the frame encompasses a view of two people (fig. 1). Once again positioned in slight negative parallax, the chess game continues to occupy the front of the image space, framed symmetrically between two candlesticks and two small ornate cases. The two individuals dominate the

1 Semantics of space in *The Three Musketeers* (2011), screenshot, TC: 00.22.21.

shot, while the room spreads out in positive parallax in the background around them.

For attentive film audiences, this specific mise-en-scène of objects in the foreground, actors in the middle ground, and a room in the background will already be familiar from shots in numerous stereoscopic films, including Hitchcock's *Dial M for Murder*.[14] In this 1954 film, a husband attempts to have his unfaithful wife murdered in his absence. Even though – or perhaps precisely because – the murder attempt fails, the husband is found out by dint of a key, crucial to

11 Ibid., TC: 00.21.52–00.22.02.

12 For an in-depth description of the stereoscopic production of space and on the associated terminology, see the contribution by Shannon Benna and its glossary in this volume, pp. 133-145.

13 Anderson 2011 (as fn. 10), TC: 00.22.02–00.23.04.

14 The film was produced using stereoscopic technology, but has generally been listed as a 2-D film due to the rapid decline of the 3-D boom in the 1950's. For a history on the screening of the film, see R. M. Hayes, *3-D Movies. A History and Filmography of Stereoscopic Cinema*, Jefferson/London: McFarland & Co 1989, pp. 171–173 and Zone 2012 (as fn. 7), pp. 35, p. 42. David Bordwell discusses this particular mise-en-scène in the entry D*ial M for Murder: Hitchcock frets not as his narrow room* on his blog *David Bordwell's website on cinama*, David Bordwell, Kristen Thompson, Observations on film art, http://davidbordwell.net/blog/2012/09/07/dial-m-for-murder-hitchcock-frets-not-at-his-narrow-room/ (accessed May 12, 2015).

his ingenious plan, that ultimately betrays him. Almost all of the scenes in *Dial M for Murder* are filmed using the image composition mentioned above, with only a few crucial elements jutting out into the movie theatre in strong negative parallax: first the wife's hand, which she desperately stretches towards the viewers at the moment of her attempted murder, and then the key, which the police inspector displays in an equally dramatic fashion.[15] These narrative moments are foregrounded – quite literally – as exceptions to Hitchcock's stereoscopic formula. Similarly, in *The Three Musketeers*, the Queen's necklace, in addition to the chessboard, also often appears in the visual foreground, thereby marking its narrative importance in the film.

However, spatiality is deployed at other levels as well. While the depth of space is relatively flat in dialogue scenes (such as the one previously mentioned between Richelieu and Mylady), it is extended in more dramatic moments, as the so-called *depth budget* is enlarged. As the *inter-axial* distance (the space between the cameras recording the images) is increased, the physical expansion of the image elements is heightened. The stereoscopically produced space is not dependent on the expansion of the actual space being recorded by the cameras, but on specific cinematographic strategies and conditions. This fact applies equally to analog and digital cinematography, although greater control can be exerted over digital shots, since they can both be assessed on the spot during filming, and corrected later in the production process. In addition, the necessary manipulations – equally possible in analog films – appear easier to achieve and can be implemented more rapidly by digital means. As such, continuous minimal adjustments become feasible, permitting – for instance – for the space to be flattened to spare the eyes of the viewer in a scene with rapid cutting. In *The Three Musketeers*, these adjustments, the exaggeration and the flattening of the visual space, can be observed in the sequences where the three musketeers encounter Rochefort, chief of the Cardinal's guardsmen, on airships.[16]

Elements in the film that move towards the audience must be handled with the same care, as they entail an intrinsic contradiction: They are both expected to appear in a stereoscopic film, but when they do, are often condemned as both cheap gimmickry and hard on the eyes.[17] In addition, they harbour the danger of destroying the illusion of physicality produced in stereoscopic films, and thus laying bare the technical sleight of hand that brought them into existence. The visual elements in negative parallax practically force themselves onto the viewer. But were they to follow their natural impulse to test the image's physicality, the viewer would reach into nothingness, reinforcing the

15 Hitchcock 1954 (as fn. 9), TC: 00.44.04 and TC: 01.39.29. The film director confirms the positioning of these image elements in his interview with François Truffaut, although he has little praise for his only 3D project. François Truffaut, *Mr. Hitchcock, wie haben sie das gemacht?*, München: Heyne, 2003, pp. 207–210, p. 208.

16 Anderson 2011 (as fn. 10), TC: 01.25.41–01.29.19. While the space is flattened in the battle sequences it is exaggerated in the sequences opening up the view into the landscape. Glen MacPherson, who worked on this film as a camera man, as well as on numerous other projects by Anderson, confirms these techniques for another joint 3-D project in the interview with R. Emmet Sweeney. R. Emmet Sweeney, Interview: Glen MacPherson, 3D DP, http://filmcomment.com/entry/interview-glenn-macpherson-3d-dp-resident-evil (accessed January 23, 2015).

17 The critics' response to the film was mixed, mostly highlighting the excessive use of visual effects in a flat literary adaptation. For one example, see Mark Feeny, The Three Musketeers Movie Review, in: *The Boston Globe* October 22, 2011, http://archive.boston.com/ae/movies/articles/2011/10/22/three_musketeers_when_swords_meet_cgi/ (accessed March 23, 2018). Elsaesser highlighted this type of criticism as a general trend in the discussion of 3-D in his essay on the genealogy of stereoscopic films and pointed out the contradictory demands placed on them. Elsaesser 2013 (as fn. 8), p. 237.

images' lack of corporality.[18] Furthermore, even if the audience accepts the optical illusion as is, it is precisely these forward-moving elements that can produce perceptual conflicts, through their positioning in the visual space relative to the screen's boundaries. If, due to negative parallax, an object appears to be placed in front of the screen, but is simultaneously intersected by the framing of the film, then this results in competing and contrasting depth references, since such an overlap normally indicates, by convention, that the object is positioned in the background.[19] The visual space at these points does not extend forwards or backwards, as is characteristic for stereoscopic technology, but moves to and over the sides. While the expansion of the diegetic space over the side boundaries of the visual space is unproblematic in two-dimensional films,[20] the frame appears more fundamentally to be recognized as a border in stereoscopic films: In *Dial M for Murder*, table lamps, which are placed at the front of the image space often produce such a conflict. Specifically in the longer takes, the viewer perceives the intersection between objects in negative parallax and the frame as breaking the illusion of corporality that stereoscopic films try to convey.[21] Even if these lamps are only slightly in front of zero parallax, they are visually irritating, since they exceed the full height of the image. Even when the objects do not produce any perceptual conflicts, their positioning in the foreground often distracts from the main action, which is in part covered up by them.[22] Image composition and framing must therefore be re-conceived and re-learned for stereoscopic filming. The placement of these

18 In the essay on stereoscopic visuality by Miriam Ross, already mentioned above, the author focuses, in particular, on image elements presented in negative parallax. The potential of the stereoscopic film to dissolve its illusion of reality would be *concentrated* in these elements. She therefore refers to these elements as destabilising the screen and its illusion, Ross 2013 (as fn. 3), p. 409. They simultaneously expand the sensory potential of the stereoscopic film in its own fashion, as she demonstrates in reference to the discourse on the haptic film. Jennifer Barker, *The Tactile Eye. Touch and the Cinematic Experience*, Berkeley, CA: University of California Press, 2009; Guiliana Bruno, *Atlas of Emotion. Journeys in Art, Architecture and Film*, New York: Vers, 2002; Laura Marks, *The Skin of the Film*, Durham: Duke University Press, 2000; Anne Rutherford, Cinema and Embodied Affect, in: *Senses of Cinema* 25 (March 2003), http://sensesofcinema.com/2003/feature-articles/embodied_affect/ (accessed January 23, 2018); Steven Shaviro, *The Cinematic Body*, Minneapolis: University of Minnesota Press, 1993; Vivian Sobchack, *The Address of the Eye. A Phenomenology of Film Experience*, Princeton: Princeton University Press, 1992; Vivian Sobchack, *Carnal Thoughts. Embodiment and Moving Image Culture*, Berkeley: University of California Press, 2004; Christiane Voss, Film experience and the formation of illusion. The spectator as 'surrogate body' for the cinema, in: *Cinema Journal* 50.4 (2011), pp. 136–150.; Ross 2013 (as fn. 3), p. 412. In parallel with this argument on the disruptive potential of image elements in negative parallax, I have interpreted these elsewhere as revenants of philosophical toys. Luisa Feiersinger, Berührung im stereoskopischen Film. Über das Ergreifen und Ergriffenwerden von optischen Illusionen, in: Steffen Haug, Thomas Helbig, Tina Zürn (eds.), *„Don't touch! Touch screen!" Das Bild, der Blick und allerhand Formen taktiler Wahrnehmung und Erkenntnis. Eine Tagung für Michael Diers*, Munich: Fink, in preparation.

19 Raymond and Nigel Spottiswoode were already working on this problem in the 1950's. They therefore propose a *stereo window* that, printed around the film image in the form of a black frame, also floats in space visually as an image element and thus eliminates the irritations produced by the overlap, Zone 2012 (as fn. 7), pp. 268–269. This frame, which is incorporated, but not perceived as such, just as is demanded by the tradition of narrative cinema, is used much more frequently in digital cinema, predominantly in individual shots, mainly thanks to the simplicity of the production of these stereo windows with digital techniques. Once again, see Benna 2018 (as fn. 12), pp. 135-136.

20 Instead of referring to the numerous publications that discuss the onscreen-offscreen relationship from specific points of view, it should be emphasised here that David Bordwell and Kristin Thompson name framing, i. e. the relationship between what is depicted and its frame, as a central category for analysis in their seminal book on the analysis of films. David Bordwell, Kirstin Thomson, Narrative as a Formal System, in: David Bordwell, Kirstin Thomson, *Film-Art. An Introduction*, New York: MacGraw-Hill, 2010, pp. 186–212.

21 Barbara Flückiger provides a clear discussion on this dissolution of the physicality of objects when they are intersected by the margin. Barbara Flückiger, Aesthetics of Stereoscopic Cinema, in: *Projections* 6.1 (2012), pp. 101–122, pp. 116–117.

22 This happens very often troughout the entire film, for one examplary instance, see Hitchcock 1954 (as fn. 9), TC: 00.15.03.

visual elements in *Dial M for Murder* raises the question as to their function, whereby the likelihood is high that their purpose was simply to stagger the depth of space, but that the chosen lamps were simply too large for the task.[23]

In the later film, *The Three Musketeers*, greater attention was paid to the relationship between the larger objects shown in negative parallax and the frame. They are never truncated by more than one visual edge, and especially not by the upper one, and then, only briefly. In addition, the viewer can observe a greater focus on the main action within the general composition of the scene. There is also a clear attempt to better integrate elements already in strong negative parallax into the image as a whole, while simultaneously maintaining the invisibility of the techniques used in the medial transmission. In concrete terms, this means that an effort was made to ensure that elements entering into the viewer's space respected the frame of the screen. In one sequence, which follows the flight of a cannonball, the projectile is staged in a complex manner within the depth of space:[24] the warhead initially hurtles straight towards the viewer, crossing through the entire stereoscopically created space, from positive into negative parallax. But, before the cannonball reaches the viewer, the camera rotates around it, subsequently following it in slow motion from the side, as it now, all of a sudden, floats in negative parallax in front of the audience, tantalizingly within reach. Safely out of range of any overlaps, its physicality appears beyond question. The camera then pans around again, this time behind the cannon ball, and follows its flight, back at normal speed, until impact.

The specific constraints that shots with effects in negative parallax must adhere to, in order to avoid irritating the viewer, are also liable to influence the narratives of stereoscopic films. The historically inconsistent re-imagination of Dumas' *The Three Musketeers* to include airships is likely a consequence of those conventions, insofar as flying elements are particularly well suited to the medium. Setting the action at height, with the protagonists hovering in the air, facilitates not only the emergence of image elements in negative parallax, without the danger of encroaching on the image frame, but also the subliminal introduction of the motif of falling. A common theme in stereoscopic films, falling, with its ability to depict spectacular views into the depths below, produces a potent vacuum-effect which pulls at the viewer, and is, as such, a favoured cause of death in *The Three Musketeers*, despite the plethora of actual weapons available. The final battle between the adversaries Rochefort and D'Artagnan takes advantage of precisely this danger, impressively displayed through stereoscopic techniques.[25] The duel on the gables of Notre Dame Cathedral in Paris, with its steeply pitched roof, opens up numerous opportunities for shots from above, looking down into the depths below. Rochefort ultimately falls into the abyss – effectively staged in positive parallax, emphasizing the dramatic nature of the location and his death.

## Means of Constructing Stereoscopic Space

It goes without saying that the risk to the actors in this scene was minimal, since the gables were located no more than half a metre above the ground on soft mats in a film-studio in Babelsberg (fig. 2a,b). The musketeers' airship also flew in

23 On the production of space in *Dial M for Murder,* see also Jesco Jockenhövel, *Der digitale 3D-Film. Narration, Stereoskopie, Filmstil*, Wiesbaden: Springer, 2014, pp. 60–64.

24 Anderson 2011 (as fn. 10), TC: 01.26.44–01.26.48.

25 Anderson 2011 (as fn. 10), TC: 01.32.31–01.36.00.

front of the green screen there, negating the need to reconstruct Notre Dame in Babelsberg, which thus only existed in virtual space (fig. 3a,b),[26] similarly to all elements lending structure to the aerial space. What Hitchcock attempted with the help of table lamps, can now be accomplished in digital films with much smaller elements. Water vapour and clouds, for instance, demarcate the spatial expansion in numerous scenes in *The Three Musketeers*. This "stereoscopic debris" is so easy to produce with CGI that it has become seemingly ubiquitous in recent films.[27] Independent of the fact that digital techniques have resulted in a simplification, and thus in an increase, of these types of cinematographic manipulations,[28] film space has nonetheless always been a synthetic space. Right from the beginning, film space was untethered from physical reality, as shots of small-scale models (standing in for larger cityscapes) or even black and white, and deep focus shots, manipulated our visual perception.[29]

Within stereoscopic film techniques, the crucial difference between analog and digital manipulations remains the ability to control the outcome. With analog techniques, the success or failure of the artificial creation of space can only be assessed once the celluloid has been developed. Digitally manipulated space can be checked on the control screen during production and sometimes even instantaneously on-set. If the visual spaces are entirely digitally generated,[30] control over the image is extended even further: Every aspect of the various components of the simulated image can be controlled and arranged.[31] In a stereoscopic set-up, the 'cameras' are essentially viewpoints onto intricately calculated generated worlds: their alignment, as well as their various stereo-parameters, can be perfectly synchronized. Light reflections, for example, that present themselves differently to analog cameras taking the shot from different positions, can result in contradictory images, which dissolve the spatial effect.[32] In CGI, they are introduced individually, and as such become easily manageable. This element of control in digital film space facilitates its use in both two-dimensional and stereoscopic films. Whereas the creation of space was possible with analog techniques, implementing it with two image tracks was far more difficult. The construction of artificial spaces was more noticeable in shots taken with two instead of one camera. Due to their planar nature *matte paintings*, used to introduce foreign environments into the backdrop, just like *rear projections*, provided the cameras filming them from different perspectives with no

26 With reference to work on the virtual spaces, see the interview with Eric Robinson, the head of the VFX team in *The Three Musketeers*. Vincent Frei, The three Musketeers: Eric Robinson – Digital Effects Supervisor – Mr. X., http://artofvfx.com/?p=1713 (accessed May 12, 2015).

27 Ross calls these elements "stereoscopic debris". It is precisely this debris that is capable of producing the "thick, tactile field screen" that is typical for stereoscopic films in the 21st Century and she attributes a prominent role to it in the construction of a "field screen". Nonetheless she notes, that these elements are not limited to the current productions techniques, but the simplicity with which they can be controlled, made it easier to integrate them. Ross 2013 (as in fn. 3), pp. 409–410.

28 On the construction of these worlds and on their persuasive powers through the simulation of photographic appearance, see Stephen Prince, True Lies. Perceptual Realism, Digital Images and Film Theory, in: *Film Quarterly* 49.3 (1996), pp. 27–37.

29 An overview on the advanced production of artificial worlds using analogue techniques is provided by Thomas G. Smith, *Industrial Light & Magic. The Art of Special Effects*, New York: Ballantine Books, 1986.

30 Nowadays, the default construction of digital worlds is that of 3D animations. These are characterized by their volumetric figures in spatial settings. They do not, however have an intrinsic connection to 3-D projection.

31 Prince 1996 (as fn. 28), as well as the discussions of the possibilities of the camera in digital film. Jessica Aldred analyzed these considering their effects on the viewer and their immersion into the film. Jessica Aldred, All Aboard *The Polar Express*. A 'Playful' Change of Address in the Computer-Generated Blockbuster, in: *animation: an interdisciplinary journal* 1.2 (2006), pp. 153–172.

32 Flückiger 2012 (as fn. 21), pp. 106–107.

2a,b Duel on the roofs of Notre Dame in *The Three Musketeers* (2011), working photography before and after insertion of the digital background.

differentiating information. As can be observed, for example, in *Creature from the Black Lagoon* (1954), they thus appear strangely flat in stereoscopic set-ups.[33] It is possible that for this very reason, Hitchcock decided to stick to a chamber play in his stereoscopic film, thereby avoiding the techniques he otherwise favoured for the incorporation of any external environment into his films.[34] The production possibilities thus effect the options available for the setting. In addition to the construction of virtual worlds and the possibilities inherent to post-production, digital filming devices produce a liberty within their scenographic circumstances that stereoscopic films did not previously have. While Hitchcock still had to build a gigantic model of a telephone to film a close-up,[35] today, digital camera can film such a scene normally, as cameras have shrunk, permitting a shorter inter-axial distance.

## Opening the Window

Overall, digital stereoscopic film is subject to fewer technical limitations than its analog predecessor, permitting a greater measure of control over profilmic objects and cinematographic staging. The wide scope for manipulation, inherent to worlds that are stereoscopically reproduced, allows spatial constructions to communicate the narrative. Despite this ostensible freedom for film producers, certain conventions have established themselves, such as reducing the effects of negative parallax and the flattening of space during rapid cut-sequences, for instance. Some of these stan-

33 Jack Arnold, *Creature from the Black Lagoon*, USA 1954.

34 The entire film, apart from two short scenes outside, takes place in two rooms in the couple's apartment. Hitchcock states that the play the film was based on was pivotal to this decision, see Truffaut 2003 (as fn. 15), pp. 208–209. Jockenhövel also highlights that it is precisely the selection of a piece that requires no outside space, which Hitchcock preferred to incorporate through matte paintings and rear projections, can be viewed as associated with the stereoscopic techniques. Jockenhövel 2014 (as fn. 23), p. 64.

35 David Bordwell shows this in his already mentioned in-depth analysis of the stereoscopic variant of the film that he published on his blog Bordwell, Thompson 2012 (as fn. 14).

3a,b Airship above Notre Dame in *The Three Musketeers* (2011), CAD working photography in the raw and fully rendered version.

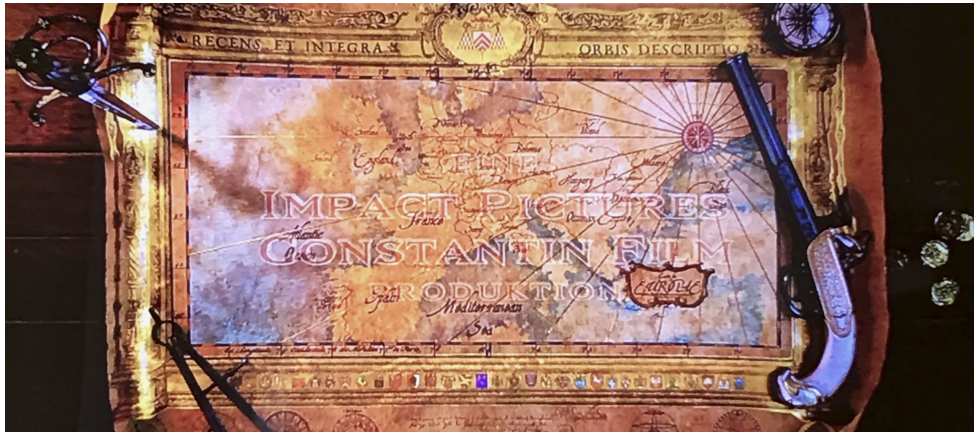
dards are also directly incorporated into film plots, which are adjusted to create stereoscopically suitable scenes and motifs. Above all, the mise-en-scène conventions outlined here serve the purpose of imitating natural perception: The technical mediation (between cinematographic manipulations and the viewer) remains as invisible as possible[36] – a principle in line with a tradition that reaches as far back as Renaissance painting, with its emphasis on a central pictorial perspective.[37] This classic art historical concept of the picture as an *open window* binds the viewer and the image to a single point, in order to convey an illusionistic space. In its two-dimensional alignment, film – even though it sets its images in motion – continues in this tradition, to a certain degree.

The title sequence of *The Three Musketeers*, invokes this concept only to leave it behind.[38] The opening credits start with a view of a map that initially appears flat, positioned slightly behind the plane of the screen (fig. 4). The map is framed by a dagger, a revolver and some coins, all elements reminiscent of *trompe l'œil* paintings. Such paintings, usually depicting flatware, present themselves as illusionistic expansions of the viewer's space. Precisely this space is then burst open when the camera moves first towards and then into the map. Its flatness dissolves into different planes within the stereoscopic depth of space: the grid that delineates the map is revealed, floating in front of the map, not dissimilar to the gridlines used in image composition. Moving through the transparent grid, and thus, quite lit-

36 Benna points out the natural depth method, developed by stereoscopic filmmakers Alan & Josephine Derobe, that mimics human binocular vision. Benna 2018 (as fn. 12), p. 142.

37 In the 15th Century, the image in central perspective was described as an open window by Leon Battista Alberti in his treatise on the art of painting. Leon Battista Alberti, *On Painting, De Pictura*, New Haven: Yale University Press, 1966. This idea of immediacy has been discussed so comprehensively as a metaphor in the discourses on the history of art and imagery, at least since Panofsky's *Perspective as Symbolic Form* (1927), that even an illustration of the central positions alone cannot be given here. In its place, reference is therefore made to the discussion of these metaphors specifically in relation to the film. Sobchack 1992 (as. fn 18), pp. 14–25.

38 Anderson 2011 (as fn. 10), TC: 00.00.35–00.01.37.




4 *Trompe-l'œil* in the opening credits for *The Three Musketeers* (2011), screenshot, TC: 00.00.37.

erally, leaving it behind, the camera then opens up a visual space that is only possible in digital stereoscopic films. Flying through an artificial space that is populated by figurines (familiar from re-enactments of historical battles), the camera's movement is reminiscent of a physical camera, moving freely within the space. But the zoom through the sky and the clouds was created digitally. By making use of stereoscopy, the film aims to produce sensation rather than realism. The figurines and their stereoscopic viewpoints are rendered in such a way that their three-dimensionality equates to human size, with the camera's flight up and through the space causing a kind of a roller coaster sensation for the viewer.

The *being there* in an artificial world, which succumbs to the screen as mediator, is nonetheless a worthy successor in this longer tradition, if one considers both the invisible screen-plane, and the technical and practical set-up that produces the screen-based image. The various viewpoints as well as the artificial world with its population of figurines have to be rendered on numerous screens. The impression of human-sized three-dimensionality is then possible through a careful arrangement of those viewpoints in *hypostereo*. Furthermore, elements – such as the clouds – are chosen for their ability to be displayed stereoscopically in arresting ways. The dissolution of the screen and the abstraction of two-dimensionality can thus only be left behind through intricate technical and narrative alignments. The screen-based image remains fixed in the mechanics and techniques of its production and reception, even when the screen is negated in a narrative sense.

## Figures

1, 4 Paul W.S. Anderson, *The Three Musketeers*, Germany/France/UK/USA 2011, in: 3-D Blu-ray, Constantin Film Verleih GmbH 2011, 111 Min., TC: 00.22.21, 00.00.37.

2–3 Digital Effects Supervisor, http://artofvfx.com/?p=1713 (accessed January 23, 2015).