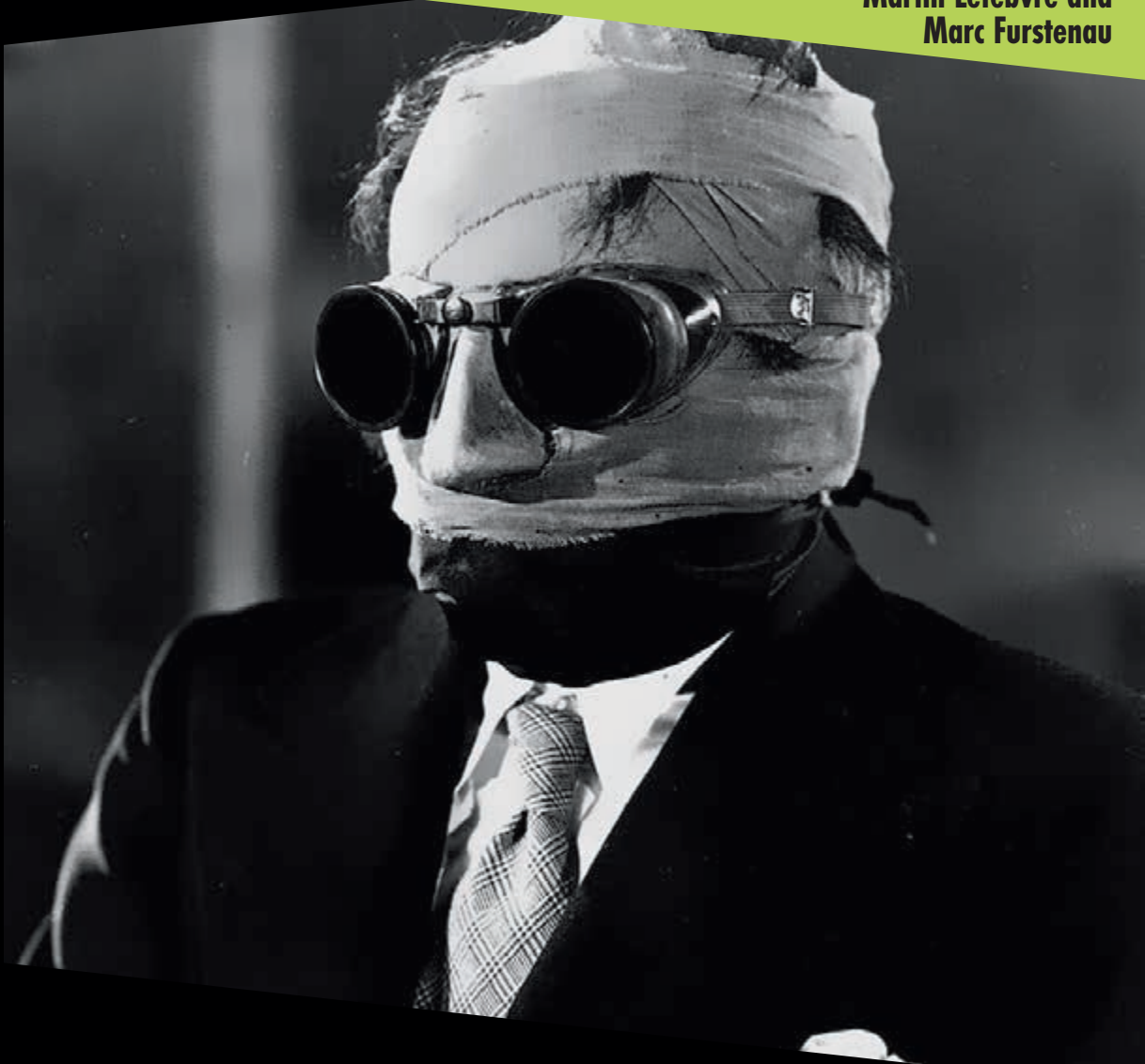# SPECIAL EFFECTS ON THE SCREEN

Faking the View from Méliès to Motion Capture

Edited by
Martin Lefebvre and
Marc Furstenau

Amsterdam
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cinema and technology

Special Effects on the Screen

Cinema and Technology

Cinema and Technology focuses on the emerging field of study on the history of film technology and its impact on the way the world is experienced, rationalized and apprehended. The materiality and nature of film devices, their function and use in diverse industrial, educational, and social contexts, and the integration of film technologies as an enduring element of consciousness, forms the basis of the scholarship presented in our books.

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Special Effects on the Screen

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to Motion Capture*

*Edited by
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Cover illustration: *The Invisible Man* (James Whale, 1933)

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Introduction

Martin Lefebvre and Marc Furstenau

Long relegated to the margins of film studies, special effects have recently become the object of a burgeoning field of scholarship, where some new questions are being asked about the status of the cinema as an art and as an industry, and some old questions are being posed anew about the formal and technical history of filmmaking. Indeed, the last few years have seen more historical and critical approaches to special effects — in books and articles — than ever before in the history of film studies.[1] Perhaps the most significant feature of special effects studies is the intersection of history and theory. Prompted specifically by the emergence of a digital cinema and the development of computerized visual effects, film theorists have been reconsidering the traditional accounts of cinematic representation. Film historians have revisited the history of filmic effects, finding many significant historical antecedents to contemporary digital effects and revealing the degree to which the problems posed by the digital have deep historical roots. The very question of what counts exactly as a "special effect" is at once historical and theoretical, and it is the goal of this collection of essays to address the problem from both perspectives.

There are many good reasons to study special effects as an integral aspect of cinematic representation. Indeed, the authors of the essays collected here

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1   Recent books on the topic include: Michele Pierson, *Special Effects: Still in Search of Wonder* (New York: Columbia University Press, 2002); Scott Bukatman, *Matters of Gravity: Special Effects and Supermen in the 20th Century* (Durham, NC: Duke University Press, 2003); Shilo T. McClean, *Digital Storytelling: The Narrative Power of Visual Effects* (Cambridge, MA: MIT Press, 2007); Dan North, *Performing Illusions: Cinema, Special Effects, and the Virtual Actor* (London: Wallflower, 2008); Stephen Prince, *Digital Visual Effects in Cinema: The Seduction of Reality* (New Brunswick, NJ: Rutgers University Press, 2012); Kristen Whissel, *Spectacular Digital Effects: CGI and Contemporary Cinema* (Durham, NC: Duke University Press, 2014); Julie Turnock, *Plastic Reality: Special Effects, Technology, and the Emergence of 1970s Blockbuster Aesthetics* (New York: Columbia University Press, 2015); Dan North, Bob Rehak, and Michael S. Duffy, eds., *Special Effects: New Histories/ Theories/Contexts* (London: British Film Institute, 2015); and Charlie Keil and Kristen Whissel, eds., *Editing and Special/Visual Effects* (New Brunswick, NJ: Rutgers University Press, 2016).

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argue that the study of special effects can be conceptually and theoretically productive towards understanding what the cinema is and how it works (and more specifically *how it works on its viewers*). Investigating special effects helps us gain knowledge about film as a material and highly technical artefact, all the while offering a perspective from which to study the style and meaning of certain films and the historical and cultural contexts in which they were made. *Concepts*, *Techniques*, *Films*: these, then, are the three axes around which this collection is organized, making the argument for the importance of fully integrating special effects in our study of cinema.

Referred to initially as trick shots or more recently as visual effects, what we can describe generally as special effects have been a staple of filmmaking since the earliest years of the commercial exploitation of cinema. Yet given their long history and their importance in the design of countless films, it is surprising how little attention has been paid to them by film scholars until recently. We would like to offer three hypotheses, or better yet perhaps three strands of a single argument, to help account for this situation. This argument rests on three historical pillars of film theory and criticism: an ideological commitment to realism; an ideological commitment to the seamless narrative text; and an ideological commitment to art and authorship.

1. *Ideological Commitment to Realism* (*or, Now You See Them, Now You Don't*). The terms "special" or "visual effects" can sometimes be used ambiguously. A film shows a superhero flying through the air, and we say to ourselves: "this is a special effect." The ambiguity resides in what the verbal index "this" refers to. Does it refer to the *means* used to give the impression that a character can fly, how the image is *effected* (e.g., an actor hung on cables and moving before a green screen and then composited into a moving background), or does it refer to the impression itself, the effect of those means on viewers (as in the advertising tagline for *Superman* [Richard Donner, 1978]: "you'll believe a man can fly")? Do special effects reside on the production side of filmmaking or on the reception side of spectatorship?

As several authors in this collection argue, early trick shots — which belonged to the cinema of attractions' mode of filmmaking — were often made so as to be noticed by viewers by creating an *effect* of awe or surprise at seeing heads severed from their bodies or objects appearing or disappearing in the blink of an eye (as in many of Georges Méliès's films). This trend continued well into the cinema of narrative integration (James Whale's 1933 *The Invisible Man* is a case in point), yet as Katharina Loew reminds us in her chapter, not all special effects from the first decade of filmmaking were equally conspicuous, meant simply to attract the viewers' attention

as effects and to be visible as such. When Porter used multiple exposures to extend the studio set of *The Great Train Robbery* (1903), it is fair to say he was using such a special effect for a different — indeed opposite — end, not as a visible attraction but rather as an (ideally) imperceptible aspect of cinematic composition. As Loew argues, between 1910 and 1930, special effects started becoming less noticeable, thus, we might add, bolstering a distinction between means (production) and effects (reception) with regards to special effects.

Apart from obvious popular genres like science fiction, films such as *The Invisible Man*, horror films like *Frankenstein* (James Whale, 1931), or fantastic adventure films like *King Kong* (Merian C. Cooper and Ernest B. Schoedsack, 1933) required effects whose visibility for the viewer lay chiefly either in how what is depicted departs from what they know to be the case in the world (there is no such thing as an invisible man, a reanimated cadaver, or a 30-plus-foot gorilla) or in how these effects altered the look or behavior of things/beings (e.g., the jerkiness of stop-motion animation). Advancements, though, in such processes as glass shots, matte shots (including traveling mattes), front and rear projections, optical printing, miniatures, mechanical effects — in conjunction with developments in film stocks, lenses, lighting, etc. — made it possible in some instances, even before the digital age, to manipulate the image more or less without the viewer's awareness (at least when what was shown did not include impossible locations or actions).[2]

2   Writing on the use of optical printing and rear projection in the pages of *American Cinematographer* in the November issue of 1936, Cecil B. DeMille praises the work of effects specialist Farciot Edouart in harmonizing the material shot for background plates for his film *The Plainsman* (1936):

> In running over the background-shots in the projection room, it was noticed that there were nice pictorial clouds in some of the shots and bare, "bald-headed" skies in others. This was natural for the location-unit had enjoyed nice skies the first day of their work and unpleasantly cloudless ones the rest of the time. But it would not be very convincing to see a bunch of Indians charging under white, fluffy clouds in one shot, and in the next, three seconds later, see them coming under a barren, cloudless sky.
> So Farciot, by means of his big Optical Printer, proceeded to put clouds in every one of the cloudless backgrounds. And they were natural clouds, too, which could not be distinguished from the real ones. He refuses to tell me just how he did it: but he did a most remarkable job; not a trace of a matte-line shows in any of the shots. (458)

Edouart was the son of a photographer, and the seamless adding of clouds was a longstanding tradition of black and white landscape photography (especially before the advent of isochromatic plates in the late 1880s). He became known for his rear-projection work at Paramount (receiving ten Academy Awards between 1937 and 1955) and headed the Special-Effects Department. Yet, certainly to audiences today, the rear projections of the *Plainsman*, although beautifully timed (events in the back-projected images seemingly reacting to those shot in the studio), are not as

Thus, effects could be created (on the filmmaking side) without obvious *effects* (on the viewing side).

Being unaware that a manipulation has taken place might explain in part why the bulk of film critics and, later, theorists did not concern themselves very much with special effects — mostly interested as they were with what can be seen or consciously experienced (especially with regard to *mise en scène*, montage, acting, plot, meaning, or even the affects they produce). Yet this would pertain only to those manipulations that were completely imperceptible to viewers, a set that, until the arrival of digital effects, did not include the majority of effects shots. For the fact is that throughout the classical era, and for some time after, rear projections, traveling mattes, optical printing, blue and green screens, techniques for color compositing, etc., were often accompanied by visual "defects" of some sort (e.g., trembling, lighting and depth inconsistencies, inadequate range of focus, ghosting, fringing or edging, etc.) when compared to "straightforward" professional cinematography, thus signaling that some special effect had been used in either production or post-production. Even today, when computerized effects have become more "seamless," many digital effects are easily detected by moviegoers (the unnatural and uncanny "bouncy," "elastic," or "weightless" movements of some computer-generated actors in superhero action scenes come to mind). Given that so many effects were indeed noticeable, why is it that they garnered so little attention in critical accounts of cinema?

Notice that in distinguishing between effects that draw attention to themselves — the rings of light around the female robot in *Metropolis* as she acquires human features (Fritz Lang, 1927), the parting of the Red Sea in *The Ten Commandments* (Cecil B. DeMille,1956), the space ships and star-gate of *2001 A Space Odyssey* (Stanley Kubrick, 1969), the liquid-metal cyborg in *Terminator 2: Judgment Day* (James Cameron, 1991) — and those that are not meant to draw attention to themselves, even though many of them were nonetheless noticeable (and in some instances of digital effects still are), we are merely extending the earlier division of *effects* and *means*. These categories can bleed into one another (e.g., the blue screen travelling mattes, such as developed by Larry Butler for the 1940 remake of *The Thief of Bagdad* [Ludwig Berger, Michael Powell, et al.], a film where the fantastic sights of the giant genie and magic carpet rides obviously draw attention to themselves, while the limitations of the technique are also quite noticeable),

imperceptible (quite the opposite) as the optically printed clouds. Cecil B. DeMille, "A Director Looks at 'Process-Shots'," in *American Cinematographer*, November 1936, p. 458.

but answering the question just posed requires we consider the matter in terms of both film aesthetics and film history.

It follows from the above that if special effects were a "blind spot" of film theory and criticism for so long, it cannot be as a result of being unnoticeable, even if in bulk they grew less attention-grabbing during the classical era (which for a long time was certainly the most studied period in filmmaking). Could it be, then, that special effects such as rear projections — think of dialogue scenes in moving cars and their background plates in classical films — were deliberately overlooked by critics and scholars of classical cinema, either as brief but necessary annoyances (because of their "imperfections") or else because they benefitted from a sort of perceptual denial or "willful suspension of disbelief" such as one could also find in classical theater with its blatantly artificial and sparse set design (when compared to what film can offer)? Or perhaps, to put it differently, they were understood and accepted merely as conventions of filmmaking (the way classical audiences accepted that drivers getting out of a car would often slide over and exit from the passenger side; or else, to paraphrase Godard, that Technicolor movie blood typically looks more like "red" — the color — than it does blood)? We might even think of them as possessing an almost *illustrative* role, somewhat like the woodcut prints that accompanied Jules Verne's novels in the original Hetzel editions. These were visual aids that interrupted the flow of words that otherwise made up the novels. This is not to say that noticeable special effects interrupted the narrative in like fashion, but they interrupted the visual texture of the film, and their presence could have equally implied a similar sort of hybridity in the spectator's experience: "I can see that some effect is being used here, but I understand it serves to illustrate or approximate what a given situation would look like if, like the rest of the film, it had been shot without effects."

In any case, it could be argued that if viewers were not physiologically blind to noticeable "defects" (why would they be?), they may well have been "culturally" or "aesthetically" blind to them in the (changing, moving) context of classical film "realism." Indeed, even after filmmakers began leaving behind the studio environment as new conventions of realism emerged in the wake of Neo-Realism, the development of lightweight cameras (and sound-recording equipment), and the competition of television, few viewers or critics seem to have paid much attention to the potentially jarring nature of special effects or to the prospect that they might throw into sharp relief, if only for a brief moment, the materiality of the medium or the conventions of classical realism. The same holds, we would argue, for those "state of the art" digital effects today that can still fall short as perfect renditions of what (we believe) things

would look like were they recorded directly, i.e., without the use of any effects. (Viewers today seem mostly fascinated by the achievements of seamless or even imperceptible effects, the latter ones only revealed in "making-of" supplements or effects companies' "show and tell" advertising demos).

It would seem that such momentary breaks in the visual homogeneity of a film's mode of representation that these noticeable effects introduce are not registered so much aesthetically (as would a character addressing the camera, and the audience, say in an otherwise "realist" dramatic film)[3] as they are on the grounds of technology, i.e., as a limit of the medium and its technology that one needs to accept and contend with in order to enjoy the "realism" of a film. And it is on this ground, arguably, that viewers can "overlook" them, as they also overlook, for example, lens flares (which are now often added as visual effects just like film grain!). If such cultural blindness exists, then it must be tied to what Dudley Andrew, in his *envoi* that concludes this book, alludes to as the history of audience expectations regarding special effects: "what counts as 'realistic,'" writes Andrew, "and what provokes credible illusions should change with each subsequent generation, even if the demand for realism and effects remain the same." As a result — and leaving aside for now all matters of content, like impossible worlds or events — until such moment as a given special effect becomes perceptually indistinguishable from non-effects footage (i.e., from what reality is thought to actually look like), it seems plausible that newer generations are always more prone to acknowledge or even to resist a convention that was accepted in the past but is no longer in use; willful blindness or acceptance of the stop-motion effects for the original *King Kong* are likely more difficult to achieve for audiences today than was the case in the early 1930s, even though the limitations in the effects' ability to smoothly reproduce movement were noticed when the film was first released.[4] In fact, the special effects of *King Kong* did not deter a staff writer from *The Hollywood Reporter* noting that "the sets and locations added greatly to the *realism* of this fantastic story" (14 February 1933; emphasis added). Enjoying *King Kong* meant a willingness not only to accept that a larger-than-life gorilla and dinosaurs exist in the fictional world of the film (their screen presence implying attention-grabbing effects) but also

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3   We all know that the situation is different with comedies (and some musicals), where the characters' metaleptic engagement with the viewer and address to the camera is allowed, even during the classical period. Typically, however, such moments are brief and only momentarily break down the impression of a self-contained world, an illusion the viewer is quick to return to.
4   See Martin Lefebvre's essay in this collection for an early review of the film.

a willingness to overlook as much as possible the technical limitations of the special effects and accept the film's "visual fiction" or conventions of make-believe so that its drama does not fall flat.

We understand cinematic "realism" here in a rather broad and formal sense. As such, we conceive of it as a representational or aesthetic system that can govern genres as distinct as social dramas, historical films, comedies, as well as science-fiction or fantastic films in the way it uses the resources of the medium to create a world that, while it may differ in content from ours (as happens in most fiction films, though most spectacularly in some science-fiction or fantastic films), does so in accordance to what is generally considered in any given era to be an unobtrusive[5] way (or the least obtrusive way possible) for forming a self-contained world with coherent and identifiable spatial and temporal relations for characters and action. When special effects serve this representational system — say, when rear-projection serves plot development while seemingly seeking to create a continuous, coherent, "realist" space between studio foreground and location background — their noticeability does not appear to provide them with any *aesthetic* visibility of their own. Thus, unless they draw attention to themselves as spectacle, as attractions, all other special effects, even when noticeable through pictorial or behavioral "defects," have long lain on the margins of film spectatorship and scholarship as "non-objects," willfully forgotten, serving (like a tool) rather than rupturing the economy of realist representation; seen with the eyes, yet more or less invisible to the mind. We may think of this invisibility as game playing: in the service of the film, its plot, and its mode of realism, the viewer is willing to "go along," to "play the game," and to accept momentary lapses in visual texture (the technique of "day for night" would be another example of a willingly overlooked visual incongruity related to a technical difficulty: capturing quality images at night). In light of such observations, our account of realism itself may need to be revised, as Marc Furstenau suggests in his essay in this collection.

As for those effects that draw attention to themselves in realist films, they phenomenologically stand out for viewers, no less than in the original *King Kong*, as highly spectacular *individualized moments*, *aspects*, or *fragments* to be distinguished from default "non-special" aspects.[6] This is still

5   Admittedly, "unobtrusive" is a vague term. It refers to a feeling that is not always shared equally among all viewers and that is also subject to change as filmmaking conventions change. What it denotes is no less real, however.

6   Such default, "non-special" aspects pertain to images or even regions in the image that do not seem to have been manipulated, even though they may have been produced by invisible and imperceptible effects. It was Christian Metz who first paved the way for a phenomenology

the case today, although our scholarly attitude toward special effects has started to change as more films make use of them in this fashion (not just popular superhero, sci-fi, and action films but also hybrid popular/art films like those of David Fincher [*The Curious Case of Benjamin Button* 2008], Christopher Nolan [*Inception* 2010], Alfonso Cuarón [*Gravity* 2013], and Wes Anderson [*The Grand Budapest Hotel* 2014]). However, when the technical means in use entail perceived defects, "going along" or "playing the game" may require greater willingness from viewers. Yet, as spectacular as they might be, accepting the rules of the game means that the effects can remain marginal and subservient to the needs of creating a self-contained fictional world. In this regard, it might be tempting to think of special effects — and to explain past critical blindness to them — in terms of the Derridean concept of the *supplément*.[7]

Indeed, it might be argued that the first special effects, the ones used by Méliès, or Segundo de Chomón, and which conceptually paved the way for all others, far from being mere adjuncts to "standard" filmmaking (i.e., default, "non-effect" cinematography), constitutively existed "within" it — perhaps even revealing the nature or essence of cinema (if there is such a thing!). For indeed, they make manifest what lies at the very heart of the cinematic apparatus itself and its operation. These earliest "trick" films exploit what makes the perception of moving photographs possible in the first place, namely those black, unexposed intervals that exist between the frames of a strip of celluloid, and whose marginal, invisible surface allowed for shooting

of special effects by distinguished between "visible," "invisible," and "imperceptible" effects. Several authors in this collection revisit Metz's taxonomy; see especially Jost, Lefebvre, Loew, and Odin. Christian Metz, "'*Trucage*' and the Film," trans. Françoise Meltzer, in *Critical Inquiry*, (3)4, 1977, pp. 657–675.

7   Present in several of Derrida's works, though especially in the analysis of Rousseau in the second part of *Of Grammatology*, and in "Plato's Pharmacy" (reprinted in *Dissemination*), the supplement is used to deconstruct the binaries that supposedly shape metaphysical thinking. According to Derrida, what could be seen as initially an "external" add-on, a mere addition or adjunct to something — supplementing it — as writing has long been conceived to be in relation to speech for instance, is in fact what makes that very thing what it is, i.e., what is otherwise missing or lacking from it in order for it to fulfill itself. This makes the supplement "internal" to that which it supplements (a sort of internal contradiction, as it were). In "Plato's Pharmacy," Derrida shows that only a blind reading of Plato could see him as simply condemning writing. For in writing against writing, Plato's writing (and his constant recourse to metaphors pertaining to writing and written signs) reveals writing as that which discloses (or fulfills) the essence of speech (considered to be the kernel of language and therefore the true object of linguistics) and thus as internally belonging to it. Jacques Derrida, *Of Grammatology*, trans. Gayatri Charkravorty Spivak (Baltimore: Johns Hopkins University Press, 1976); and "Plato's Pharmacy," in *Dissemination*, trans. Barbara Johnson (Chicago: University of Chicago Press, 1983): 61-171.

interruptions, for montage, and all the tricks of the famous substitution splice technique as well as the animating of inanimate objects. They also exploit another basic fact of photography (whose emulsion records only light), according to which shooting a black surface leaves the corresponding area of celluloid unexposed, thus making possible the production of composite images through multiple exposures. (Both these properties of cinema, which were so brilliantly exploited by Georges Méliès, are discussed in the essays of Donald Crafton, Martin Lefebvre, Benoît Turquety, and Marc Furstenau in this volume). But if special effects stand as some sort of supplement to "standard" cinema, could critical blindness or resistance to them — resistance to accounting for them and thus, ironically, resistance toward cinema itself — reflect that they threaten to deconstruct the cinema, at least the dominant realist cinema (and the conception we have of it) that they so often appear to serve?

2. *Ideological Commitment to the Seamless Narrative Text* (*or, The Bad Object*). There is an irony in our discipline's current interest in special effects. Scholarship is rendering them visible just as the technology is emerging to make them more imperceptible and more seamless than they have ever been. This is not to say that effects are always used imperceptibly nowadays — far from it, as any summer blockbuster will prove. Take the 2019 computer-generated "live action" version of *The Lion King* (Jon Favreau), a remake of the original 1994 Disney animated film (Rob Minkoff and Roger Allers): it can only be understood as a *tour-de-force* demonstration of the full capacities of current effects technologies, meant to be experienced *as* special effects.[8] But the fact is that a great deal of the effects work happening these days goes unnoticed (Brainstorm Digital's demo reel for Scorsese's *Wolf of Wall Street* [2014], which is easily found on the web, is a case in point),[9] which should make us wonder why effects that were more noticeable in previous eras did not elicit more scholarly interest.

    There is no question that it was the film industry's embracing of digital technologies at almost every station of the workflow, although especially in production and post-production, that has led to special effects attracting

8   The computer-generated imagery of animals in the film is truly remarkable and, at first glance, is very difficult to distinguish from photographic imagery. Yet as an anthropomorphic fantasy, the effects become visible or perceptible *as* effects the moment the animals start to speak — this is, one might say, the specific special effect on display in the film.

9   As the headline of a 2014 article by Eric Limmer in the online technology magazine *Gizmodo* puts it, "It's Crazy How Much of *The Wolf of Wall Street* is Actually CGI." See https://gizmodo.com/its-crazy-how-much-of-the-wolf-of-wall-street-is-actua-1501402962.

so much attention of late. Moreover, as a result of digitization, the current degree and variety of image manipulation is probably unsurpassed in the history of cinema (save only for animated films). It was not, though, so much towards special effects *per se* that scholars turned to with the onset of cinema's digital age. Rather, it was to the "ontology" of the photographic image and the fate of cinematic "indexicality." An anxious discourse initially arose as film theorists became concerned that films might not be recordings of the world anymore, even though the culturally dominant form of cinema was based on using these recordings for the purposes of representing fictional worlds, a purpose for which special effects, past and present, have always been well-suited and widely used. While analog-era effects did not circumvent the recording nature of the medium as many digital effects now do (though it could be argued that the "save" function in computer software is a recording device of some sort, simply not a *photographic* one), they nonetheless exploited several of its limitations in order to introduce a rift between what is photographically recorded and what is represented.

The notion of "limitation" here is to be understood in the spirit of Rudolf Arnheim's consideration of the formative power of film and the ways in which the film image differs from reality — i.e., the world in itself as it exists and is perceived independently of its cinematic recording. Thus, close shots of the "life-size" prop hand of Kong holding Ann Darrow (Fay Wray) show real, *recorded* events, and yet they rely on a framing that only shows that part of the gorilla's body (the effect is furthered with process photography for the background views), hiding the fact that the hand is not actually part of a gigantic beast but rather a mechanical facsimile. An effect is created simply by using a prop and cropping reality through framing so that instead of seeing Fay Wray sitting on a large fake hand (as a production still with a wider framing might clearly disclose), the audience sees Ann Darrow held in Kong's grip. The same could be said for the use of miniatures which relies in part on the fact that the camera does not discriminate size. As for glass shots, rear projections, double exposures, substitution tricks, or optical printing, they all equally use the recording nature of film while exploiting the fact that photography, because it produces an image, does not distinguish between recording the world and recording an image (especially when the images appear photo-realistic on screen), making possible the blending of world and image.

In a sense, none of these traditional effects challenge the idea of cinema as a recording medium that captures aspects of the world on film. After all, that actors in a studio stood in front of a screen where images of the jungle are projected is a fact that the camera has recorded. What

they do challenge, however, is any notion that the (fictional) world the film depicts photographically is an *honest* "transference of reality from the thing to its reproduction," as André Bazin famously wrote.[10] When Hitchcock uses a miniature train in the *dénouement* of *Secret Agent* (1936), the photographed train is not meant to depict a miniature but rather a full-size train. Yet it is *no more* a photographic record or "transference of reality" of that full-size train than a drawing would be as a likeness of one (hence the connection made earlier between noticeable effects and illustrations in novels). However, the film's rhetoric, the inclusion of this train in the narrative — the film's main cast of characters are on board — the continuity in eventhood, the use of montage and sound, all work together to make viewers understand and, following what was said above, perhaps even accept that the miniature (it is quite noticeable, after all) stands for the full-size train that, in the fiction, is carrying the film's principals. Through the alchemy of the fiction that the film constructs, what Bazin claimed was the nature of the photograph (in this case, the photographic images of the miniature train) starts adulterating: what the photographic images show and what they represent is different.[11] The process is completed when such effects become imperceptible (often with technological advances). At this point, the difference does not resolve itself in fiction, for it is now also perceptual in nature: once an effect becomes imperceptible, perception and cognition are unsuspectingly tricked. Thus, whereas in a non-effects fiction film what is seen on screen and what exists in reality actually correspond term to term (even if what we see is a street in Toronto passing for one in New York), the same cannot be said when effects become imperceptible: the worldly "reality" depicted,

10   Bazin, of course, is comparing photography with painting when he says that "Photography benefits from a transfer of reality from the thing to its reproduction" (trans. Martin Lefebvre). The two published translations, Hugh Gray's and Timothy Barnard's, are noticeably different: "Photography enjoys a certain advantage in virtue of this transference of reality from the thing to its reproduction." André Bazin, "The Ontology of the Photographic Image," in *What is Cinema?*, vol. 1, trans. Hugh Gray (Los Angeles: University of California Press, 1967), p. 14; "Photography transfers reality from the object depicted to its reproduction," André Bazin, "The Ontology of the Photographic Image," in *What is Cinema?*, trans. Timothy Barnard (Montréal: Caboose, 2009), p. 8.

11   Patrick Maynard has emphasized this aspect of photographic and cinematic representation, with his distinction between "detection" (or recording) and "depiction" (or fiction). He considers what he describes as the "endemic confusion about photography," which he argues is the result of "a failure to develop a simple terminological distinction between *a photograph of something* and *a photographic depiction of* something" (114; emphases in original). See Patrick Maynard, *The Engine of Visualization: Thinking Through Photography* (Ithaca and London: Cornell University Press, 1997).

which serves as the material substratum for the fictional world of the film (its diegesis), was never truly photographed *per se* (even if the effect in question involves photography, as in glass shots or the use of props), but only *appears* to have been photographed as depicted.

Could it be then that special effects were more or less willfully overlooked by post-war critics and theorists because they undermine the "ontological" specificity of photography — an aspect of filmmaking only acknowledged when cinema massively adopted photography-mimicking digital effects and computer imagery (CGI)? Yet special effects remained largely invisible to critics and theorists when the mood swung over to apparatus and ideology critique. Considering post-1968 debates, one wonders if special effects could have offered at the time a site from which to question the realism their use usually sought to serve — thus de-naturalizing cinematic realism, as it were — and to question the idea that cinema, through its tie to photography, possesses some deep, ontological predisposition for realism. The anti-idealist and anti-realist camp would instead elect montage — whose noble genealogy included the Soviet avant-garde — and the rest, as the saying goes, is history. Might it be, then, that special effects were a bad object for both realists and anti-realists alike?

We know that Bazin seems to have distinguished between two sorts of special effects: mechanical *trucages* or props that are homogeneous and continuous with the real world and whose effect can therefore be recorded (e.g., the hidden strings that dictate the balloon's movements in *Le ballon rouge* [*Red Balloon*, Albert Lamorisse, 1956]), and those that require manipulating the image. We might think of them as "special effects that express a belief in reality" and "special effects that express a belief in the image." Bazin shows himself willing to accept the first type but not the second one, which he likens to montage in their ability to cinematically create an event. Thus in "Montage interdit" (first translated as "Virtues and Limitations of Montage"), Bazin criticizes the use of composites and process shots:

> True, [...] techniques such as rear projection, make it possible for two objects [...] to be seen together [...]. The illusion here is closer to perfection [than it is by creating the effect through editing], but it is not undetectable. In any event, the important thing is not that the trick effect be invisible but whether or not they are used, just as the beauty of a fake Vermeer could never take precedence over its lack of authenticity.[12]

12   Bazin, "Editing Prohibited," in *What is Cinema?*, trans. Timothy Barnard, op. cit., p. 78.

The critique brings together two issues. The first concerns the noticeability of the effects; the second one their inauthenticity or dishonesty. The first issue might seem to be a technical matter — such that in several cases it could be solved by advances in effects technology and filmmaking know-how — which is why a moral issue is brought in to buttress the argument. In both instances, however, it is the photographic nature of film that is at stake, by which is meant its ability to record (and, for Bazin, to reveal) reality.

It should be obvious by now that our practical-minded convention-agreeing or game-playing account of spectatorship in the face of noticeable special effects, while it may serve as one explanation of their "cultural invisibility," contrasts with Bazin's more fine-grained view of realism. As complex as this notion may be in his writings, Bazin's realism, at least as it is implicitly defined in the quotation above, opts for a more discriminating understanding of "self-containment" and "obtrusiveness." Accordingly, anything that hinders the illusion of a world existing independently of the image — a world shown to viewers in such a way that what they see could have been shot in a single take (i.e., a photographable world) — risks appearing "unrealistic."[13] Theoretically speaking, then, detecting the presence

13   This is why Bazin's realism can accept editing and special effects, as long as they do not give the impression of creating the event depicted. This is a theoretical stance for Bazin. As a critic, however, he was sometimes more forgiving. In his 1952 review of *When Worlds Collide* (Rudolph Maté, 1951), he writes: "The end of the world special effects, the tidal wave that engulfs New York, the explosion of the earth attracted by a rogue planet, the construction and launch of the rocket ship, its landing on planet Zyra, all display a rather astonishing realism" ("*Le choc des mondes*: L'arche de Noé atomique" initially published in *Le Parisien libéré* 2424, 30 June 1952, and reprinted in André Bazin, *Écrits complets*, vol. I, Hervé Joubert-Laurencin [ed.], [Paris: Macula, 2018], p. 953). Most of the effects mentioned by Bazin here use miniatures. However, the view of New York submerged is a painting, and the landing of the spacecraft on Zyra shows a miniature with a very noticeable painted background. As soon as the ship lands, two of the film's principals go the deck to see whether the air is breathable (it is!) and take a look at humanity's (only white Americans!) new planet. The camera follows their off-screen gaze by panning to the valley below. This is a composite shot done on the optical printer that merges the actors with a painting that looks as if it were from an animated cartoon. It is difficult to think of these effects, including the miniatures, as anything but an equivalent to montage, in the sense that Bazin uses the term to critique Jean Tourane's *Une fée... pas comme les autres* (*The Secret of Magic Island*, 1956) in "Forbidden Montage." The claim here is that because Tourane is using animals that are not acting their parts but are mostly standing still or moving minimally in each shot, the entire film relies on montage and the accretion of shots: in short, the actions depicted *could not* have been filmed in a single take, for the animals are incapable of performing them continuously. But the same description equally applies to the special effects segments in Maté's film, since what is depicted in those moments only exists in miniatures and composites, i.e., in cinema. In the terms of "Forbidden Montage," only certain mechanical effects (like the strings of *Ballon rouge* or the life-size animatronic shark of *Jaws* [Steven Spielberg, 1975]) or else pyrotechnics,

of an effect could therefore jar the viewer into a skeptical stance regarding the reality of the world depicted. In an otherwise realist film, a noticeable painted backdrop or rear projection might give the impression that an *alien* or *foreign* (in German *fremd*) element has suddenly intruded in the film — an element that, like montage, belongs to cinema rather than to a world (that appears) independent from it. And while Bazin doesn't quite think of the matter in such terms, what he objects to can be construed as a potential *Verfremdungseffekt*, as indeed highly noticeable rear projection has sometimes been used by later modernist filmmakers (Straub-Huillet, for instance, in *Chronik der Anna Magdalena Bach* [*The Chronicle of Anna Magdalena Bach*], 1968).[14]

Yet post-1968 critics did not seize on special effects' adulteration of photography's tie to reality as a site of critique of realism and illusionism nor in their attempt to replace theoretical idealism with Marxist materialism and ideology critique, not even through deconstructionist readings of special effects films. Were these scholars as blind as their predecessors to the implications etched out by Bazin in "Montage interdit," blinded by filmmakers' attempts to seamlessly "suture" (to use a term from that era!) special effects shots to realistic non-effects cinematography regardless of their success in achieving it? But there might also have been something

wind machines, and stunts can be said to be sufficiently homogeneous and continuous with the real world so as not to "fall" into the realm of "montage." Yet the fact that Bazin found the special effects in Maté's film "realist" arguably attests to a certain willingness to overlook their obvious "unrealness."

14   As briefly discussed above, it seems that classical-era audiences and critics were inclined to avoid any "modernizing" or "political" readings of such noticeable effects, which, in any case, would have worked against the grain of the films themselves (not a commonly held notion at the time). Viewers instead appear to have turned a blind eye to any potential aesthetic or political implications, endeavoring to coherently, if not seamlessly, integrate such effects into the fictions they appeared to serve. Turning a "blind eye" does not mean not noticing; rather, it means minimizing as much as possible what can detract from the film's unity of style or from what is implicitly constructed as its intent. By contrast, in the segment of *Chronicle of Anna Magdalena Bach*, where Bach gives an outdoor recital at night, the filmmakers make no attempt to use rear projection to approximate a unified narrative space—quite the opposite in fact. There is a clear mismatching of perspective, angle, focus, and lighting between the foreground (Bach playing harpsichord) and the slanted projected building in the background. This is simply an additional strategy used by Straub-Huillet to estrange the viewer in a modernist film that eschews most conventions of classical realism and underlines the artifactuality of the film. Note that for viewers, the only difference between Straub-Huillet's use of rear projection and classical Hollywood's — both being noticeable — lies in their ability to infer a different intention in each instance, that is to say, whether or not viewers recognize that some effort is made either to mask or to emphasize the hiatus between what is photographically recorded and what is represented.

else at stake, something deeper still that made special effects somewhat unpalatable for ideology critique.

For one thing, of course, effects form a little industry of their own within the film industry (and now beyond). Every era has had its own state-of-the-art effects, and they often involve patents, require specialized technicians, and entail extra expenditures. This is why the more up-to-date (and expensive) effects usually only find their way into big-budget films (at the very best, films that could occasionally fit into the *Cahiers du cinéma*'s notorious "Category E"!). But more to the point might be the second issue Bazin raises in the quotation above, one concerning morality or ethics in representation.

With part of their lineage found in stage magic shows (the other source being conventional theater, as François Albera, and Frank Kessler and Sabine Lenk remind us in their essays), early special effects were more than attractions, they were also, in many cases, *trompe-l'œil*. However, there are two types of *trompe-l'œil*, and we need to distinguish between perceptual and cognitive deceit. In perceptual deceit alone, the effect is (or seeks to be) seamless, though we are aware nonetheless, because of the content, that an effect is being used; whereas in cognitive deceit the *trompe-l'œil* is (or seeks to be) both seamless *and* imperceptible: viewers are simply unaware that an effect has been used. One strives to be a *visual fiction*, the other a *visual lie*. But, if seamlessness is a condition of imperceptibility and of a successful lie, any *attempt* at seamlessness that does not involve an impossible content (viz., hiding a cut, attempts to blend foreground and background in rear projection, etc.), can be understood as an *attempted lie*, even if the effect is noticeable. As a result of this lineage, and somewhat ironically, special effects — whose images were neither factual nor truthful, strictly speaking — could only have been conceived of as a bad object by both Bazin *and* post-68 critics. For the latter, imperceptible special effects could only have been complicit with dominant realist ideology in their effort to mask their true nature, while most noticeable effects might appear as failed attempts at doing so rather than properly modernist gestures. Either way, as a result, special effects could appear as morally corrupt for both Bazin and the "anti-Bazinians" for whom, unlike montage, special effects seemed almost willy-nilly to serve the seamless narrative text rather than actively resist it.

3. *Ideological Commitment to Art and Authorship* **(or, It Ain't What You Do...).** There is, finally, a third strand in our account that can help explain the prior lack of scholarly attention given to special effects and which can

itself be broken down into several more specific factors as they all relate to the discipline's longstanding commitment to art and authorship.

a) Authorship/Craft. Unlike Méliès, most filmmakers do not shoot or create the special effects sequences for their films (although there have been exceptions and different directors have had varying degrees of involvement with the production of special effects).[15] Highly specialized skilled artists, craftspeople, and special technical consultants are usually hired for this purpose. (At one point during the classical era, all the major studios had a special-effects department.) Some effects, such as background plates for rear projections or computer-assisted compositing, have to be shot separately, which is usually undertaken by a second unit. In this regard, we might think of special effects shots as analogous to the landscape settings and backgrounds of large-scale Renaissance paintings, which most times were painted by apprentices, while the Master took charge of the figures in the foreground.

The use of second units or the need for specialized crews certainly furthered the sense that special effects are a marginal aspect of filmmaking, at least until the advent of a constant flow of blockbuster effects-dominated films where both narrative (plot and character) *and* special effects seem to equally vie for the spectator's attention (in these films, in fact, the narrative often becomes a mere pretext for a smorgasbord of effects). Yet the comparison with landscape painting falls short aesthetically. Having gained their complete independence from the depiction of characters and events, landscape came to thrive as a genre of its own starting in the seventeenth century.

Although the work of certain special effect artists has been celebrated, (from Willis O'Brien and Ray Harryhausen to Douglas Trumbull and John Dykstra), their overall social status is still closer to that of craftspeople than that of full-fledged *auteurs* or artists. Thus, as magnificent as Trumbull's effects for *2001: A Space Odyssey* were for 1969 (and still are), as an *artistic* achievement *2001* is first and foremost considered to be a Stanley Kubrick film. Although film studies as a discipline has taken its distance from criticism and aesthetic evaluation over the years — not to mention auteurism — thanks in good measure to film theory, cultural studies, and film history, the stigma of craftsmanship attached to special effects has certainly been a factor in their earlier neglect by the mainstream academic film

15   James Cameron, for instance, worked as a special-effects assistant and matte artist in the early stages of his career.

studies community, a community whose object of study, whether individual scholars care about it or not, has acquired the status of artistic medium. In the social hierarchy of filmmaking, special-effects units are thus seen as involving highly skilled workers whose task is to meet and fulfill the director's conception of their film.

b) ***Fragments***. The fact that special effects are created by a specialized crew also points to what seems to be their fragmentary nature with regards to an entire film. Thus, filmmakers and viewers (when the effects are not imperceptible to them) often use the terms "special-effect shot" or "special-effect sequence" to distinguish these segments from the rest of a film. And though they may be an important attraction in a film (what would the success of the *Star Wars* saga be without special effects?), they seem to have a practical purpose in illustrating a story — or, better yet, displaying *moments* or *elements* belonging to a story. Thus, when the *only* admirable aspects of a narrative feature film are said to be its special effects, the film is usually considered a failure. Their fragmentary aspect might furthermore be reinforced when used as attractions (which by definition excludes imperceptible effects). Like any attraction, special effects have the potential to stand out in a film as quasi-independent fragments, spectacular moments that are almost experienced for their own sake, *all the while* serving the narrative. Think, for instance, of the use of "bullet-time" in *The Matrix* (Lana and Lilly Wachowski, 1999): while viewers understood the action depicted in the narrative, they often individuated these moments in their viewing experience ("Wow! *This* is so cool!") and could wonder how the effect was achieved all at once.

There is little doubt that the experience of film viewing builds upon integrating fragments of different sorts (not just spectacular special effects) in a constant back-and-forth between part and whole-in-the-making (this corresponds to what is also known as a hermeneutic circle), but it is the integrated result — wholeness as finality — that tends to be seen as the valued object, not the fragments in themselves. Thus, as long as special effects were conceived as fragments momentarily fulfilling the requirements of a story as best possible — a furthering of the idea of *supplement* mentioned above — they failed to receive sustained attention in film scholarship.

c) ***Technical discourse***. Of course, one should not think that nothing of interest was written about special effects prior to the digital age — far from it. It is just that *academic* film scholars mostly stayed away from the topic, just as for a long time they shied away from many of the more

technical aspects of filmmaking (including in-depth discussion of various cameras, lenses, editing devices, projectors, etc. and their impact on film style, form, and meaning). Thus, for a long time, special effects were mostly the province of technical discourse and discussed in the pages of trade publications like *American Cinematographer*. Film Studies, on the other hand, initially grew out of film criticism. If interest is currently rising for "Industry Studies" in our discipline today, in the wake of film history's interest for technical developments and patents, it is because many feel that a major gap in scholarship needs filling. Now it is fair to say that from the perspective of criticism or any phenomenological or viewer-based approach to film, it can be difficult if not impossible to identify what sort of special effects are being used in a given segment of a film. Moreover, for the longest time, film scholarship was conducted (it often still is) with only the most basic knowledge of the medium's technical means. Therefore, for previous generations of scholars, studying special effects might well have meant investigating the technical means of filmmaking (a secondary interest at most) regardless of the aesthetic, cultural, or ideological import of the medium. Today the tide has obviously turned. With the introduction of digital effects and with the realization of their widespread use, special effects have become an important site from which to deepen film theory and to investigate the production and the reception of films as well their aesthetic proclivities.

<p align="center">***</p>

The essays in this collection represent a wide range of views on special effects from diverse perspectives, but all accept that the question of special effects can no longer be relegated to the margins of film studies. A complete account of the cinema needs to acknowledge special effects as a constituent part of the medium, indeed as a major technical but also aesthetic component of filmmaking and as an important part of the experience for the audience. Each of the essays builds upon and develops specific aspects of the burgeoning field of special effects studies. They have been divided into three sections that reflect what we, as editors, consider to be each chapter's primary focus. But as the reader will discover, these sections are anything but airtight, as several issues or concerns carry over between them. The opening section gathers essays that address special effects mostly through theoretical or philosophical questioning, considering some of the basic concepts necessary for their analysis. Essays in the second section trace the historical developments of the technologies and techniques of special effects

and discourses around their use. Authors in the final section of the book turn to specific examples of film for analysis to investigate various questions raised by special effects from the late silent period to the digital age.

It is, then, as noted, around these three axes—*Concepts, Techniques, Films*—that this collection is organized. We conclude with an *Envoi* by Dudley Andrew, in the very traditional sense of the term, as a "letter of dispatch," setting the discipline of film studies upon a new course with special effects as a central topic but without abandoning or forgetting the accomplishments of the past, the enduring significance of, for instance, a figure like André Bazin, still so central to so much of contemporary film theory. In light of the significant advances made recently in the study of special effects, it is not the goal of this collection to argue for the legitimacy of their study but to quite simply proceed with both theoretical and historical analyses. Accepting that special effects are a basic aspect of cinematic representation, though, requires that the question of what such representation consist of be asked anew.

Concepts: It is just such a fundamental question that is addressed in the first section, in which certain basic questions are revisited in light of an acknowledgment of the integral nature of special effects. In this section, the authors find, through the consideration of special effects, openings into sundry perennial problems of film theory and suggest some solutions to various theoretical impasses. Several key terms of film theory are reconsidered — notably realism, simulation, imagination and the imaginary, indexicality — as well as more general philosophical concepts such as meaning, representation, and the phenomenological and pragmatic questions of experience, belief, interpretation, and even ethics. Less an exhaustive survey of the theoretical field from the perspective of special effects, this section provides some speculation on specific aspects of their theoretical significance.

Martin Lefebvre, in the opening essay, explores the notion of "gap" as a way of addressing the conceptual and constitutive nature of the special effect. The same question is raised by both Donald Crafton and Benoît Turquety in their essays. There is, of course, and most importantly, the real, material gap that existed originally between film frames, which allowed for the very first kinds of special effects, created for example by Georges Méliès, who used editing to produce effects of substitution and transformation. From this basic material fact, though, Lefebvre then considers the many ways in which our experience of the cinema is governed by some more general and significant sense of a "gap" that exists between film worlds and

the real world of phenomenological experience, and the role that special effects have played in the construction of film worlds, which necessarily engage the audience, to some inevitable degree, eliciting some reflection on the constructed nature of those worlds. Building on earlier work he has done on the question, Lefebvre offers a careful analysis of the concept of "indexicality," which is at the center of the phenomenological account of film viewing that he outlines.

John Belton, too, is concerned with the basic phenomenological question of the viewer's experience when confronted with a necessarily constructed image. For Belton, contemporary visual effects raise the fundamental question of the very nature of the image, which is, he argues, and as revealed most explicitly by digital effects, necessarily "composite." Like Lefebvre, and like François Jost in his essay, Belton raises the issue of indexicality, providing a summary of recent debates on the matter. He challenges the traditional accounts, though, which tend to conceive of it as a constituent element of particular kinds of imagery, offering instead the more pragmatic argument that it is the spectator who determines whether "something is or is not indexical." Building on the work of Stephen Prince on contemporary visual effects, Belton describes the complex spectatorial experience of engaging with increasingly intricate audio-visual compositions. As a deliberate "manipulation of reality," the cinematic image necessarily involves us in an imaginative undertaking, as Belton emphasizes. He traces the links between the image and the imaginary — which he distinguishes, though, from the use of the term in the psychoanalytic work of Christian Metz. Less a potentially deceptive or illusory phenomenon, the composite image — characteristic of the cinema — is the site of imaginative engagement.

François Jost places the question of special effects in the cinema within the context of the longstanding concern in modern philosophy, at least since Descartes, of the relation between perception and reality, doubt and belief. This philosophical problem is given acute manifestation in the cinema, which, Jost argues, has developed an extensive repertoire for the creation of certain kinds of perceptual "tricks," or *trucages*. These are, Jost insists, as integral a part of cinematic representation as the more familiar elements of cinematography and *mise en scène*, as ordinary a part of filmmaking, we might say, and as François Albera also argues, as framing, lighting, montage, and color. While *trucages*, or special effects, may of course be used to create deceptive imagery — to "feign" — this must be distinguished from the more "ludic" use of such techniques in the creation of fictions. The relation between cinematic tricks and belief must be described according to a clear distinction between beliefs about the real world and beliefs about

the worlds of fictions. Jost builds on the famous work by Christian Metz[16] on film and *trucages* to develop a "general theory of *trucages*" while critiquing some aspects of Metz's approach and developing some of his insights in a pragmatic direction instead. Concerned less with the problem of deception, which Metz seemed to emphasize, Jost describes instead the role of effects in relation to what the spectator believes to be watching (viz., fiction or documentary).

Marc Furstenau asks whether the use of special effects can be incorporated into a revised theory of cinematic realism. Special effects have often been thought to disrupt the essentially realistic nature of cinematic representation. Long described as illusory, or as the techniques for the creation of illusion, the main concern had been that special effects would create only a false or misleading realism. Alternatively, the specific illusions that special effects create have been understood to be in the service of the generally illusory nature of cinematic representation itself. Furstenau argues, though, that illusionism and realism have to be separated and clearly distinguished as concepts. Against an illusion theory of cinematic representation and of pictorial depiction generally, he argues that realism in the cinema is thoroughly a matter of style, and that it need not become entangled with apparently related but in fact tangential questions of perception, belief, and "reality" but focused on the stylistic and thematic uses to which special effects may be put according to a more deflationary account of realism.

Techniques: From such general and abstract speculations about special effects, the second part of the book moves on to some more specific considerations of the historical development of effects technologies and the critical debates about their use. Frank Kessler and Sabine Lenk trace the history of debates about special effects, specifically in Germany, back to those in the early nineteenth century about the proper staging of theatrical dramas, when there was quite acute concern about the proper use of so-called "mechanical artifices." Surprisingly, they discover that while there was considerable emphasis in early critical accounts of dramatic spectacle on the need for "discretion" when using such artifices, lest they overwhelm and obscure the "poetic and dramatic force of a text" when using mechanical means to visualize these on stage, there was far less concern about the use of tricks in early cinema. Given the inherently "mechanical" nature of the cinema emerging at the beginning of the twentieth century, it seemed

16   Metz, "*Trucage* and the Film," op. cit., pp. 657–675.

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more obviously appropriate to employ the full force of cinematic artifice. Kessler and Lenk draw our attention to what are in fact often very different discursive contexts for different art forms and show that, while there are some important continuities between the theater and the cinema, there are also quite different critical concepts that have been applied to them. In the process, Kessler and Lenk also manage to distinguish two different schools of thinking about theatrical effects: the German and the French.

François Albera makes a related argument, tracing the origins of special effects back to early cinema, where they emerged as a constituent part of the new form, partly as an extension of techniques that had been developed in the theater but also as distinct methods unique to the cinema. Emphasizing, like Kessler and Lenk, the mechanical nature of the cinema, Albera describes the emergence — first in the theater but then in the new medium — of the "great machinist." This is who we would now call the effects technicians, those craftspeople with an increasingly specialist knowledge charged with the task of realizing the visions of the dramatist and the filmmaker. Many of those working in theater, and then in film, became famous in their own right, providing the indispensable means for the creation of technically complex representations. Albera traces the history of the term "special effect" — in French, "*effet spécial*" — which is, and remains, he says, perfectly "ordinary," understood as those techniques that were necessary, even inevitable, as the cinema developed aesthetically. Built into its representations is the very fact of the cinema's "machinic" nature. At the heart of the new medium, he argues, is the very question of modernity itself, of automation, industrial production, technical expertise — the basic question of the relation between the human, labor, and the machine.

Developing the notion of the "gap" raised by Lefebvre, Donald Crafton describes the very significant "spaces between the frames" through the exploitation of which special effects first become possible. He describes the cinema, intriguingly, as "a system for structurally omitting information," allowing, and again as an inherent capacity, for the creation of deliberately designed compositions. Like so many of the contributors to this volume, Crafton very carefully considers the material basis in the cinematic apparatus itself to trace the origins of special effects. He also returns to Méliès, and to Henri Bergson, whose description of the cinema as consisting of discrete units of stillness helps us to see that, as Crafton puts it, and as Benoît Turquety also suggests, "the cinema has always been digital."

Turquety considers in very precise detail the nature of the effects pioneered by Georges Méliès, specifically his famous "substitution trick" but also his use of other techniques, including superimpositions, multiple exposures,

mattes, and so on. He, too, describes how Méliès exploited the "gap" in the film recording process — as well as black backgrounds as empty spaces on which to superimpose other imagery — to create his intricate composite compositions. In contrast to more usual accounts of photography and photographic processes, Turquety describes the medium's fantastic possibilities, inherent in the very material constitution of the cinema, deployed almost as soon as it was invented to create elaborate and fanciful compositions. Through a re-reading of the early-twentieth-century French philosopher Henri Bergson, Turquety argues that the sorts of manipulations thought to be characteristic of the digital era can be seen to have their origins in these early experiments, as Bergson seemed to have intuitively understood in his account of the cinema, despite his reservations about the new medium as consisting of discreet still images or temporal samplings.

Katharina Loew charts the history of the transition from the "tricks" of early cinema, created by amateur generalists, to special effects, understood as the domain of technical specialization. She argues that, starting around 1910, special effects have not, for the most part, been used for the creation of elaborate, "attention-grabbing" spectacle. Rather, they have typically been meant to go unnoticed, creating seamless but often complex composite representations. On the basis of a modified version of the taxonomy of effects provided by Metz, she looks back to the silent feature film, where we may see the emergence of "standardized composite techniques," and the increasing specialization necessary to create the look of mainstream cinema.

For Roger Odin, special effects must be understood as part of the means by which the cinema is used as a medium of communication; he contends that one needs, moreover, to distinguish in any analysis between different "spaces of communication." Like others in this collection, he begins with Metz's formative essay on *trucages* but revisits it through his own pragmatics of communicative spaces. Thus, the specific value of any effect is shown to be determined by the different "cinematic spaces of communication," which include, for instance, different genres. Special effects, though, are by no means exclusive to the cinema, according to Odin. Indeed, he seeks to expand the notion of "special effects" to all forms of image manipulation made possible in the digital age and by new modes of image production, including the use of cellphones to shoot still or moving images. Building, too, on the work of Jacques Aumont, Odin describes the production of effects as a fundamental technical craft of the modern digital world, which produces not "representations of reality" but a new kind of communicative utterance.

Finally, Phillipe Marion considers various recent films that use the contemporary technology of motion capture, which he describes as a "perpetual

special effect." He posits that the cinema is no longer essentially a camera art, and he describes what he calls the "subjugation of the profilmic" to such techniques as motion capture. He notes that while effects still tend to be described as "special," they are in fact now an entirely routine part of filmmaking. As a routine element, he considers the question of how they are at once experienced both as effects by an increasingly knowledgeable and informed audience and as the means for the creation of a convincing diegesis. Special effects, he argues, are a part of the very "ontology" of the cinema, "part and parcel" of the film medium itself now. Marion also considers the effects that new digital effects techniques are having on traditional aspects of cinematic composition, like editing.

Films: In the third section of this volume, several specific case studies are undertaken. Janet Bergstrom offers an account of a particularly exemplary special effects film, F.W. Murnau's famous *Sunrise* (1927), his first Hollywood film after emigrating to the United States from Germany. Bergstrom describes the emergence of a cadre of specialized effects technicians, whose contribution to this film was indispensable to its success. The film was marketed at the time as a technical feat to be marveled at for its special effects. Bergstrom describes the various aspects of the filmmaking, which combined the in-camera effects of the cinematographer and set designers, but equally importantly the postproduction work of the effects technicians and the careful work of matte painters. The film is notable for its use of a newly patented process, the "Williams shot," and marks the beginning of an increasingly complex division of labor that continues to characterize filmmaking to this day.

Suzanne Liandrat-Guiges considers that most famous of movie monsters, *King Kong*, and the significance of the figure in the 1933 film by Cooper and Schoedsack. There is, she argues, an inherent paradox in the use of special effects in the film, so obvious as effects, which nevertheless create such a compelling fictional world. This is not, however, any kind of straightforward deception or illusion but a more subtle and complex spectatorial experience that weaves the special effects with the entire formal and rhetorical design of the film. The perceptual aspects of special effects — which, as she notes, are explicitly thematized in the film through a *mise-en-abyme* structure that incorporates a film within the film — are the basis for a more complex conceptual experience, according to the "open perspective" that she provides. Liandrat-Guiges shows how the film's visual design and plot offer a layered perspective that is at times created by, and at times literally mirrored by, the use of special effects, so that a "nesting or mirroring

principle presides over the film's aesthetic." Her claim, in the end, is that proper understanding of special effects in a film cannot be limited to the aims of simply offering a "realistic" depiction of what cannot otherwise be depicted; rather, their meaning resides in the way they relate to the entire system of a film, including its plot.

This section concludes with two very careful and detailed historical analyses of particular effects in two important films that exemplified and promoted specific techniques. Kristen Whissel recounts the use of 3D effects in *House of Wax* (André de Toth, 1953), starring Vincent Price. Often dismissed as little more than a gimmick film, Whissel convincingly demonstrates how it very effectively exploits the specific effects of 3D, namely the "negative parallax" effect, by which the items of the film world seem to extend physically into the space of the theater, the world of the spectator. The especially "uncanny" nature of this effect is compared to that of waxworks themselves, whereby, and according to a Freudian account of the *Unheimlich*, basic boundaries are effaced: between the past and the present, the living and the dead, the animate and inanimate — and between the screen space and the spectatorial space. The resulting effect, Whissel argues, is "emblematic" of the cultural and political fluidity of modernity itself, which was felt acutely in the 1950s, as enormous technological and cultural changes were underway in the cinema and beyond.

Sean Cubitt, too, describes the effects of special effects on the medium itself. Considering the example of the sci-fi action film *Oblivion* (Joseph Kosinski, 2013), Cubitt describes what he calls the peculiar "lack of identity" characteristic of digital special effects. As thematized or dramatized (deliberately or not) in this film, Cubitt argues that such a lack of identity corresponds to a more general, cultural sense of ontological and epistemological instability. The claim is that special effects have always responded to the different needs and interests of film audiences, while belonging to art's perpetual repositioning of the ancient and constitutive instability of the category of the "human." Read allegorically, the effects in a film like *Oblivion* thus reveal an emerging "world view," which understands human existence itself to be subject to increasingly intricate mathematical calculations.

The range of essays in this volume suggests, we hope, the vitality and the importance of special effects as a central topic in film studies. Yet, and as Dudley Andrew argues in the concluding essay, it is important to see how the newly emerging question of special effects is continuous, in many respects, with earlier historical and theoretical speculations about the cinema. Well-known for his very subtle exegeses of the critical writing of

André Bazin, Andrew explores the question of special effects in relation to Bazin's still very influential account of realism. Bazin, of course, explicitly raised the question of special effects on only a few occasions in his writing, yet, as Andrew argues, it is at these points — when, for instance, he considers the historical fortunes of the technique of the "superimposition" in the cinema — that the subtlety of his account is revealed. In contrast to the usual sort of distinction assumed to be operative in film theory, between a strict normative emphasis on realism and a strident formalism, we can discover in Bazin a much more complex and nuanced account, what Andrew calls a "flexible realism." Bazin was, he says, fully aware that the cinema was first of all a technical apparatus and subject necessarily to historical change, the result of both new artistic approaches by filmmakers and the changing tastes of audiences. The "ontology" of the cinema, in this respect, lies precisely in the fact of material change, in the constant reinvention of the medium, the development of various technical means for the creation of compelling representations that will continue to grip the imaginations of audiences. Even in the case of the most enduring and influential of the "realists" in film theory, then, we in fact discover a quite subtle historical but also phenomenological account of the effects of special effects, which are an inherent part of the always changing technical and aesthetic apparatus of the cinema.

Andrew is concerned to "open" Bazin to the contemporary digital era — not to simply vindicate his original claims but rather to find in his responses to the technical developments of his era a guide to our responses to our own. "Unlike the pure cinephiles at *Cahiers*," Andrew writes, "Bazin frequently stepped back from films to examine cinema as a medium evolving from, and alongside, traditional artistic media (theater, painting, and especially the novel), and in relation to emerging technologies that amounted to the new media of the 1950s (television, 3D, Cinerama, 'Scope')." It is, Andrew suggests, a lesson for film scholars today to be sensitive to the complex historical, discursive, and material and technical contexts within which the cinema emerged and which continues, unceasingly, to develop and change, with special effects at its heart.

<p style="text-align:center">***</p>

Finally, we want to acknowledge that the impetus for this book was an event organized in Montréal by André Gaudreault, Viva Paci, and Martin Lefebvre and held at the Cinémathèque québécoise in November 2013. This gathering, entitled *The Magic of Special Effects: Cinema, Technology,*

Reception was a resounding success with over 400 attendants, and has led to numerous publications. Several of the essays here gathered — though not all of them — started out as papers presented in Montréal.

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